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**CENTER FOR STRATEGIC  
DETERRENCE STUDIES**

**NEWS AND ANALYSIS**

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## Feature Report

***“Major Power Rivalry and Nuclear Risk Reduction: Perspectives from Russia, China, and the United States”***. Published by Center for Global Security Research/Lawrence Livermore National Laboratory; Edited by Brad Roberts; May 2020

<https://cgsr.llnl.gov/content/assets/docs/Major-Power-Rivalry-and-Nuclear-Risk-Reduction.pdf>

Since its founding in 1992, the Center for Global Security Research (CGSR) has had an abiding interest in nuclear threat reduction. In the 1990s it did some of the leading thinking about cooperative threat reduction with post-Soviet entities. In the early 2000s it focused increasingly on strengthening the nonproliferation regime. Since 2015 one of its primary interests has been exploring the future of cooperative strategies to reduce nuclear/strategic dangers. That future faces many challenges, both technical and geopolitical. By 2020, a rising sense of urgency of nuclear danger had clearly taken shape in the United States and internationally, driven in significant measure by the renewal of major power rivalry and potential military flashpoints among those powers. And that urgency has driven a rising national and international exploration of what can be done to reduce nuclear dangers.

To better understand both those dangers and what can be done to reduce them, CGSR convened a workshop in February 2020 involving more than 70 experts from diverse institutions inside and outside the United States. We explored the following key questions:

- What are the most serious nuclear dangers and risks today?
- Where do we stand with the international project to reduce those dangers and risks?
- What new approaches can usefully be pursued? Bilateral? Multilateral? Unilateral?
- How does the global geopolitical landscape affect the prospects for success?

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- [The Pacific Deterrence Initiative: Peace through Strength in the Indo-Pacific](#) (War on the Rocks)  
“The best way to protect U.S. security and prosperity in Asia is to maintain a credible balance of military power. But America’s ability to do so is at risk.”
- [The New START Verification Regime: How Good Is It?](#) (Bulletin of the Atomic Scientists)  
“It is precisely this carefully crafted verification regime that has made the treaty, which limits each nation’s strategic nuclear arsenals at no more than 1,550 deployed nuclear warheads and 700 delivery platforms, so effective and trustworthy.”
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# NUCLEAR WEAPONS AND DETERRENCE

The Guardian (London, U.K.)

## **North Korea's Kim Jong-un Holds Talks on Increasing 'Nuclear War Deterrence'**

By Agence France-Presse

May 23, 2020

North Korea discussed new policies for increasing its “nuclear war deterrence” during a military meeting presided over by leader Kim Jong-un, state news agency KCNA reported on Sunday.

KCNA did not specify what the nuclear deterrence entailed, but said that “crucial measures” were taken at the meeting “for considerably increasing the firepower strike ability of the artillery pieces of the Korean People’s Army”.

North Korean defectors say sorry after false Kim Jong-un speculation

“Set forth at the meeting were new policies for further increasing the nuclear war deterrence of the country,” the agency reported.

Its said discussions at the Central Military Commission meeting centred on “putting the strategic armed forces on a high alert operation” in line with the “building and development of the armed forces of the country”.

If the meeting, the date of which was not given, occurred in the past few days, it marks Kim’s first public appearance in almost three weeks, according to South Korean news agency Yonhap.

In April, rumours swirled about Kim’s health after he was conspicuously absent from a mid-month celebration for the birthday of his grandfather, only to turn up weeks later at the opening of a fertiliser factory.

News of North Korea’s nuclear discussions came after it emerged that security officials in US president Donald Trump’s administration had discussed holding the first US nuclear test since 1992 as a potential warning to Russia and China.

Daryl Kimball, executive director of the US-based Arms Control Association, told the Washington Post that such a decision would likely disrupt negotiations with Kim, “who may no longer feel compelled to honour his moratorium on nuclear testing”.

<https://www.theguardian.com/world/2020/may/24/north-koreas-kim-jong-un-holds-talks-on-increasing-nuclear-war-deterrence>

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Bossier Now (Bossier City, La.)

## **Barksdale AFB: The Only B-52 Formal Training Unit in the USAF Unfazed during Pandemic**

By Jessica Daurizio

May 26, 2020

The 93rd Bomb Squadron has pushed forward on its mission at Barksdale Air Force Base, graduating 30 new B-52 Stratforfortress aircrew during April and maintaining a steady pipeline of initial, upgrade, and re-qualification candidates even in the face of the COVID-19 pandemic.

The 93rd Bomb Squadron, an Air Force Reserve unit assigned to the 307th Bomb Wing, is the only B-52 Formal Training Unit in the Air Force. The unit is responsible for providing the Air Force with its entire contingent of pilots, electronic warfare officers and weapon systems officers, a critical role in keeping the nuclear-capable jet a viable deterrent to potential adversaries.

“We are committed to preserving the ability of our instructors to train our aircrew so they are able to provide for our national defense,” said 307 Bomb Wing Commander Col. Steve Kirkpatrick. “We must stay mission ready even in the current situation.”

#### Safety measures implemented during training

Adjustments, in the classroom and beyond, had to be made in order maintain that ability.

The number of students allowed in the classroom at one time was modified to adhere to Force Health Protection and Center for Disease Control and Prevention guidance. Other safety measures implemented included assigning students as specific set of instructors, minimized traffic in work spaces, and assigned mission planning rooms.

Also, the past graduation ceremony in April didn’t happen on stage with family and friends as previously done.

“Family and friends didn’t get to cheer on the class that graduated in April because of the distance requirements resulting from COVID-19,” said Capt Kyle Allen, 11th Bomb Squadron Academic Flight commander. “We decided to have something for them that met the guidelines, but still recognized all of their hard work.”

#### A steady supply of new aircrew

The 93rd Bomb Squadron operates the B-52 Formal Training Unit, but they don’t do it alone. They have an active association with the 11 Bomb Squadron who falls under the 2nd Operations Group.

The total force arrangement helps ensure B-52’s have a steady supply of personnel to fly them, regardless of what else is happening.

“We do everything possible and practical to continue training,” said Lt. Col. Chris Chandler, 93 Bomb Squadron commander. “We, alongside our active-duty counterparts in the 11 BS, are committed to getting these students trained and out the door to their squadrons.”

The first four months for an FTU student consist of academics. Following this phase, they start the flight line portion which lasts approximately four months.

The next group of students moved into this hands-on phase immediately following the previous class’ graduation, ensuring a steady supply of new aircrew.

— By Jessica Daurizio, 307th Bomb Wing

— Feature photo: U.S. Air Force Lt. Col. Jonathan Gunther, 11th Bomb Squadron instructor pilot, leads 1st Lt. Wilfred Chan and 1st Lt. Kelsey Shane, both 11th BS student pilots on a visual inspection of a B-52 Stratofortress at Barksdale Air Force Base (U.S. Air Force photo by Master Sgt. Ted Daigle)

<https://www.bossiernow.com/barksdale-afb-the-only-b-52-formal-training-unit-in-the-usaf-unfazed-during-pandemic/>

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Salt Lake Tribune (Salt Lake City, Utah)

## Utah Downwinders Denounce Trump's Talk of Restarting Nuclear Tests

By Lee Davidson

May 27, 2020

The Trump administration is talking about restarting nuclear arms tests, which alarms Utah “downwinders” — who suffered cancer from atomic tests conducted upwind in Nevada decades ago.

“I burst into tears when I read that,” says Mary Dickson, a longtime advocate for downwinders. “I live every day with watching the effects that testing all those years ago had on so many people I know and love. We’re still living with the consequences of fallout from testing... Their cancers are coming back. They are more at risk during the pandemic. But we think of doing it again.”

Rep. Ben McAdams, D-Utah, opposes any new nuclear testing.

“Utah families are still suffering and dying as a result of health effects from nuclear tests conducted decades ago,” McAdams said. “Radiation from nuclear tests is poisonous to our health and environment, and I am not willing to subject more families to this type of exposure, not to mention subjecting the world to a renewed nuclear arms race.”

The reactions comes after The Washington Post reported that administration officials are discussing resuming tests possibly to help draw China into negotiations with Russia and the United States in a trilateral deal to regulate their arms.

Any new tests would likely be underground, unlike the open-air tests that especially hurt Utah downwinders.

“But underground tests often leak” and vent radiation downwind, said Preston J. Truman, a longtime leader of downwinders. He just finished radiation and chemotherapy for more cancer that he blames on fallout from when he was a child in southern Utah. “And testing would continue to ensure we go on with nuclear weapons. We should have learned our lesson by now.”

Discussions about new tests follow accusations from Trump administration officials that Russia and China are conducting low-yield nuclear tests — an assertion that has not been substantiated by publicly available evidence and that both countries have denied.

The United States has not conducted a nuclear test explosion since September 1992 — which was underground at the Nevada Test Site — and nuclear nonproliferation advocates warn that doing so now could have destabilizing consequences.

As Daryl Kimball, executive director of the Arms Control Association, told The Post, “It would be the starting gun to an unprecedented nuclear arms race. You would also disrupt the negotiations with North Korean leader Kim Jong Un, who may no longer feel compelled to honor his moratorium on nuclear testing.”

Deb Sawyer, chairwoman of the Utah Campaign to Abolish Nuclear Weapons, said, “It would be one of the worst things that the administration could do with respect to international security.”

Radioactive waste from Estonia may soon be coming to San Juan County mill

Sawyer said a better step to make the world more secure would be ratifying the proposed Comprehensive Test Ban Treaty, but Trump has backed away from that — which has made the ban a partisan issue.

Steve Erickson, another longtime downwinder advocate, said Utah downwinders “have been concerned about the potential for a resumption of testing since the Trump administration took office,” and worried about reports that it may seek a new generation of nuclear arms.

“If you’re going to deploy a new weapons design, you’re going to want the assurance of a real-scale test to determine whether or not what you’ve made is going to work in the field,” he said. “Once you start down this path, you’re going to build a certain amount of institutional momentum that is hard to curtail or reverse.”

He added, “There is a reason why we’re seconds from midnight on the atomic doomsday clock these days. And that has occurred largely in the last three years of the Trump era.”

Dickson sees restarting testing as “utterly immoral and almost criminal,” and added, “My biggest problem is I do not trust the administration to do it right.”

Neither does John Tierney, a former nine-term Democratic congressman from Massachusetts who now leads the Center for Arms Control and Non-Proliferation.

“It is beyond reckless to provoke a possible widespread return to explosive testing simply to make a political point. No one doubts the nuclear supremacy of the United States — least of all China,” he said in a written statement.

Because of the experience of downwinders, Tierney called on members of Congress from Utah and Nevada especially to fight the proposal.

McAdams, the Utah Democrat, said he opposes resuming tests, although the Republican members of the Utah delegation did not immediately respond to requests for comment.

McAdams also noted that Congress is considering bills to expand compensation to some downwinders and uranium miners who did not qualify for previous payment programs at the same time that the Trump administration is talking about resuming testing.

“We have not yet compensated thousands of Utahns injured by their own government, who told them there was ‘no danger’ from nuclear weapons tests,” he complained.

<https://www.sltrib.com/news/politics/2020/05/26/utah-downwinders-denounce/>

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Defense One (Washington, D.C.)

## **If Given OK, US Could Conduct a Nuclear Test in a Matter of Months, Pentagon Official Says**

By Marcus Weisgerber

May 26, 2020

The United States could conduct an underground nuclear weapons test within months of being given an order to do so, a senior Pentagon official said Tuesday.

But there has been no change in the U.S. policy to not test nuclear weapons, said Drew Walter, who is performing the duties of deputy assistant defense secretary for nuclear matters. He spoke four days after the Washington Post reported that “senior officials representing the top national security agencies” discussed conducting a nuclear test during a May 15 meeting.

“[I]f the president directed, because of a technical issue or a geopolitical issue, the system to go test, I think it would happen relatively rapidly,” Walter said Tuesday at a Mitchell Institute event.

Walter said the Energy Department's National Nuclear Security Administration, which oversees the maintenance of U.S. nuclear weapons, "has a requirement to retain the ability to resume testing on particular timelines. Reviewing those timelines for the readiness posture regularly is always prudent."

NNSA officials "maintain the capability to do all of that underground work," Walter said, meaning they have a location suitable for an underground nuclear test.

A nuclear test could be conducted "with limited diagnostics...within months, probably not years," he said. But he added that the time to prepare for "a fully diagnostic" test that generates "lots of data, all the bells and whistles, so to speak, might be measured in years."

The United States has not tested nuclear weapon since 1992. The U.S. has signed the Comprehensive Nuclear-Test-Ban Treaty but the Senate has not ratified it.

In April, a State Department report accused Russia and China of having performed nuclear tests.

"The United States finds that Russia has conducted nuclear weapons experiments that have created nuclear yield and are not consistent with the U.S.'zero-yield' standard," the report said. The report also questioned China's nuclear activities saying they "raise concerns regarding its adherence to the 'zero yield' standard."

"There is widespread concern about the major disparity in the way Russia and China appear to interpret and adhere to the zero-yield standard contained" in the treaty, Walter said. "We should be mindful of the implications over the long term of what other countries will learn, maybe not today, but in the long term, if they conduct tests at a — lower-yield tests that go supercritical.

<https://www.defenseone.com/threats/2020/05/if-given-ok-us-could-conduct-nuclear-test-matter-months-pentagon-official-says/165662/?oref=d-river>

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Real Clear Defense (Washington, D.C.)

## **The Role of Nuclear Weapons in China's National Defence**

By Fiona S. Cunningham

May 28, 2020

At the end of April, two upgraded Chinese Type-094 nuclear-powered ballistic missile submarines (SSBNs) reportedly went into service. But China's SSBN capability is a far less important component of its nuclear deterrent than its land-based missile force. And that nuclear deterrent plays an important but limited role in China's national defence. Absent major strategic change, the role of nuclear weapons in China's national defence strategy is unlikely to expand. And absent major technological change, the relative importance of China's sea-based deterrent is also unlikely to grow.

Although the commander of U.S. Strategic Command, Admiral Charles A. Richard, recently stated that he could 'drive a truck through China's nuclear no first use policy', that policy has played a critical role in China's nuclear force development since 1964. China's nuclear force structure is optimised to ride out an adversary's nuclear strike and then retaliate against an adversary's strategic targets, rather than credibly threaten first use. China's operational doctrine for its nuclear forces doesn't include plans for the first use, or threat of first use, of nuclear weapons in a conventional conflict. While Chinese leaders and strategists have debated changes to the no-first-

use policy from time to time, there's no sign that China plans to abandon it. The policy was most recently reaffirmed in China's 2019 defence white paper.

China's top leaders in the politburo and Central Military Commission exercise strict control over both the formulation of nuclear strategy and the authority to alert or use nuclear weapons. To ensure they're not used accidentally, mistakenly or without authorisation, nuclear weapons are kept off alert in peacetime and warheads are stored separately from delivery systems in a central depot deep in the country's interior.

There are two potential changes to the threat environment that could prompt Beijing to rethink its restrained nuclear posture: a dramatic increase in the intensity of the U.S. threat China faces and a radical technological change that weakens its retaliatory-only policy.

If Chinese leaders concluded that a future conflict with the U.S. posed an existential threat rather than a limited war, they could look to nuclear weapons as insurance against a conventional defeat that eliminated the Chinese state. But such a change is by no means a given. Chinese strategists stress a number of reasons for the country's restrained nuclear strategy, including the difficulty of controlling nuclear escalation and geography. China's large size provides it with non-nuclear options for defeating a conventional military threatening its survival. An increase in U.S. hostility wouldn't remove these incentives for restraint.

A breakthrough in the development of counterforce technology is also unlikely to change China's retaliatory nuclear posture, unless it were so radical that it made that posture unviable. Those changes would have to enable the U.S. to credibly threaten to destroy most of China's retaliatory force. It would also have to render China's other options for ensuring a survivable nuclear force futile, such as expanding its arsenal size or shifting to a launch-on-warning alert status. Such radical technological change is unlikely, despite persistent U.S. efforts to improve its counterforce capabilities.

Regardless of whether either of these situations come to pass, China's land-based missile force is unlikely to be displaced by its sea-based deterrent as the primary leg of its retaliatory nuclear capability, for four reasons.

First, Chinese strategists acknowledge the shortcomings of the current generation of Type-094 submarines, which are noisy and therefore vulnerable to sophisticated U.S. strategic anti-submarine warfare (ASW) capabilities. China could overcome these technological hurdles in the future, although it would be racing against simultaneous American ASW improvements—something the U.S. has proven adept at throughout and since the Cold War.

Second, and regardless of its technological progress, China does not (yet) appear to have invested in its own strategic ASW forces. It may therefore lack confidence that SSBNs patrolling in the open ocean could evade detection by U.S. ASW capabilities. Protecting SSBNs using the PLA Navy's conventional forces is another option, but would come at an opportunity cost for other naval missions.

Third, China's geography makes its SSBNs more vulnerable to ASW than those of the U.S. and other naval nuclear powers because they must pass through chokepoints in the first island chain to enter the Western Pacific. The territory bordering those chokepoints belongs to U.S. allies and partners, who may assist U.S. ASW with shore-based signals processing. No technical improvements to Chinese submarines are likely to be able to overcome the disadvantages posed by its geography.

Fourth, developing operational doctrine for SSBNs poses distinctive challenges to strict control of top Chinese leaders over the use of nuclear weapons. Those leaders may not be comfortable with pre-delegating authority to use nuclear weapons to submarine commanders if communications are severed, or mating nuclear warheads and missiles in peacetime. Yet without these two amendments

to its nuclear operations, which is optimised for the land-based force, China may not be able to reap the full benefits of deploying an SSBN force for securing a second-strike capability.

Given these constraints, why, then, has China continued to develop a sea-based nuclear deterrent?

Speculatively, a mix of hedging and organisational interests of the PLA Navy is the most likely explanation. SSBNs may help China to hedge against improvements in U.S. missile defence focused on intercepting missiles launched from the Chinese mainland.

Although China's SSBN force is unlikely to become central to securing its second-strike capability, it could have a strong influence on U.S.–China strategic stability.

In addition to the use-or-lose pressures resulting from operating a vulnerable SSBN force in a crisis, SSBNs could undermine confidence in China's nuclear restraint. If Chinese leaders decide to change their warhead handling practices, or pre-delegate nuclear launch authority, they will change longstanding practices for China's nuclear operations. As China formulates operational doctrine for its SSBN force, it should carefully consider the value of existing nuclear practices as signals of restraint.

This piece was produced as part of the Indo-Pacific Strategy: Undersea Deterrence Project, undertaken by the ANU National Security College. This article is a shortened version of chapter 7, 'The role of nuclear weapons in China's national defence', as published in the 2020 edited volume *The future of the undersea deterrent: a global survey*. Support for this project was provided by a grant from Carnegie Corporation of New York.

Fiona S. Cunningham is an assistant professor of political science and international affairs at George Washington University.

[https://www.realcleardefense.com/articles/2020/05/28/the\\_role\\_of\\_nuclear\\_weapons\\_in\\_chinas\\_national\\_defence\\_115324.html](https://www.realcleardefense.com/articles/2020/05/28/the_role_of_nuclear_weapons_in_chinas_national_defence_115324.html)

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## US COUNTER-WMD

C4ISRNET (Vienna, Va.)

### **Infrared Sensors for the Space Force's Future Missile-warning Satellites Pass Key Milestone**

By Nathan Strout

May 26, 2020

Two candidate payloads for the U.S. Space Force's Next Generation Overhead Persistent Infrared satellites have passed their preliminary design review, with critical design review expected in fall 2021.

Next Gen OPIR is to replace the Space-Based Infrared System, a constellation of satellites hosting infrared sensors used to detect and track ballistic missile threats. The Space Force says the new system will be more survivable than its predecessor.

The Space and Missile Systems Center plans to place five satellites in the initial constellation: three geosynchronous, or NGG, satellites built by Lockheed Martin; and two polar satellites being built by Northrop Grumman. The two infrared payloads that passed preliminary design review are for the first two NGG satellites.

“NGG is a critical piece of our missile warning architecture that will deliver a capable, resilient, and defensible missile warning system to counter determined adversaries,” said Col. Dennis Bythewood, program executive officer for space development. “This milestone demonstrates our ability to move with deliberate speed, while maintaining the technical and programmatic rigor needed to ensure success.”

The Space and Missile Systems Center is developing the two NGG payloads competitively, with Raytheon Space and Airborne Systems behind one effort and Northrop Grumman Aerospace Systems working with Ball Aerospace on the other. Each will design, manufacture, assemble, integrate and deliver one payload to fly on the first two NGG satellites designed and integrated by Lockheed Martin. The efforts are taking place in parallel to mitigate schedule risks as the Space Force works to launch the first NGG satellite in 2025.

“Detecting missile launches early starts in space. Each layer, or orbit, provides a necessary and unique view of the Earth to initially detect and then track a missile. Passing the Preliminary Design Review shows that our approach meets mission requirements, putting this ‘Go Fast’ program one step closer to launch. What sets us apart is our deep technology bench. Being able to pull or modify critical technology, like focal planes and electronics, from our other programs allows us to rapidly develop new designs for any orbit,” said Wallis Laughrey, vice president of space systems for Raytheon Intelligence and Space in a statement.

Lockheed will work with the Space and Missile Systems Center to decide which payload goes on which space vehicle, and then competitively select one of the developers to build an additional payload for the third NGG.

“The two successful reviews were key milestones in demonstrating our readiness to move forward. Our next steps are the build and test of engineering design units, or EDUs, and procurement of critical flight hardware for the first Space Vehicle delivery in 2025,” said Col. Daniel Walter, the Next Generation OPIR space segment program manager. “The mission payload EDUs will be critical enablers to demonstrate mission capabilities and exercise key integration activities that will burn down program risk before the space flight hardware is delivered.”

<https://www.c4isrnet.com/battlefield-tech/space/2020/05/26/infrared-sensors-for-the-space-forces-next-generation-missile-warning-satellites-pass-key-milestone/>

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## US ARMS CONTROL

VOA (Washington, D.C.)

### **Iran Rejects US Cancellation of Nuclear Sanctions Waivers**

By VOA News

May 28, 2020

Iran says a U.S. move to cancel the last remaining sanctions waivers from the 2015 nuclear agreement will not impact its nuclear work.

A spokesman for Iran’s Atomic Energy Organization said in a statement Thursday that the Trump administration is trying to “distract public opinion” and that U.S. actions do not put pressure on Iran.

Secretary of State Mike Pompeo speaks during a press briefing at the State Department on Wednesday, May 20, 2020, in Washington...

U.S. Secretary of State Mike Pompeo announced Wednesday the sanctions waivers that allowed other countries to work on Iran's civil nuclear projects without penalties would not be renewed.

He said Iran had engaged in "nuclear brinkmanship" with its increased nuclear activities and that those actions would draw pressure and increased isolation from the world community.

The United States withdrew from the nuclear agreement in 2018 and has applied several rounds of economic sanctions.

Iran has complained that the other signatories, particularly Britain, France, Germany and the European Union, have not lived up to their pledges to help Iran get around the U.S. measures.

It took successive actions against its promises in the deal, including boosting its stockpile of enriched uranium beyond agreed limits and enriching uranium to higher levels.

The 2015 deal was meant to address accusations Iran was working to build a nuclear weapon, with the limits designed to keep Iran from having the materials necessary for that kind of program.

Iran has said its nuclear program is only for civilian purposes such as power generation and medical research.

<https://www.voanews.com/middle-east/voa-news-iran/iran-rejects-us-cancelation-nuclear-sanctions-waivers>

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AP via VOA (Washington, D.C.)

## **Trump: US May Rethink Decision to Exit Open Skies Surveillance Treaty**

By Associated Press

May 21, 2020

WASHINGTON - President Donald Trump said Thursday that Russian violations make it untenable for the U.S. to stay in a treaty that permits 30-plus nations to conduct observation flights over each other's territory, but he hinted it's possible the U.S. will reconsider the decision.

The Open Skies Treaty that governs the unarmed overflights was initially set up to promote trust and avert conflict between the U.S. and Russia. The Trump administration informed other members of the treaty that it will pull out in six months because Russia is violating the pact and imagery collected during the flights can be obtained quickly at less cost from U.S. or commercial satellites.

"Russia didn't adhere to the treaty. So until they adhere, we will pull out, but there's a very good chance we'll make a new agreement or do something to put that agreement back together," Trump told reporters at the White House before leaving for Michigan.

"So I think what's going to happen is we're going to pull out and they (the Russians) are going to come back and want to make a deal," Trump said. He added: "I think something very positive will work."

The U.S. announcement that it plans to leave the treaty is expected to strain relations with Moscow and upset some members of Congress and European allies, which benefit from the imagery collected by Open Skies flights conducted by the U.S.

In Moscow, Russian Deputy Foreign Minister Alexander Grushko criticized the U.S. decision.

"Our position is absolutely clear and is invariable: The withdrawal of the US from this treaty will come as yet another blow to the system of military security in Europe, which is already weakened by the previous moves by the administration," Grushko told state news agency Tass.

Trump's national security adviser Robert O'Brien said the president has made clear that the United States will not remain a party to international agreements being violated by the other parties and are no longer in America's interests. He said Russian violations prompted Trump last year to pull out of the 1987 nuclear arms treaty with Russia.

That treaty, signed by President Ronald Reagan and Soviet leader Mikhail Gorbachev, banned production, testing and deployment of land-based cruise and ballistic missiles with a range of 500 to 5,500 kilometers (310 to 3,410 miles).

Trump's decision to exit the Open Skies Treaty also raises questions about his commitment to extending or renegotiating the New START treaty, which expires early next year. New START, the only remaining treaty constraining the U.S. and Russian nuclear arsenals, imposes limits on the number of U.S. and Russian long-range nuclear warheads and launchers. Russia has offered to extend the treaty, but Trump is holding out in hopes of negotiating a three-way agreement with the U.S. and China.

"We look forward to negotiating with both Russia and China on a new arms control framework that moves beyond the Cold War constructs of the past and helps keep the entire world safe," O'Brien said in a statement.

President Dwight Eisenhower first proposed the United States and the former Soviet Union allow aerial reconnaissance flights over each other's territory in July 1955. At first, Moscow rejected the idea, but President George H.W. Bush revived it in May 1989, and the treaty entered into force in January 2002. Thirty-four nations have signed it; Kyrgyzstan has signed but not ratified it.

More than 1,500 flights have been conducted under the treaty, aimed at fostering transparency about military activity and helping monitor arms control and other agreements. Each nation in the treaty agrees to make all its territory available for surveillance flights and share all the imagery collected, yet Russia has restricted flights over certain areas.

Alexandra Bell, a former State Department official and currently the senior policy director at the nonpartisan nonprofit Center for Arms Control and Non-Proliferation, said withdrawal from Open Skies will rub allies the wrong way.

"I absolutely cannot see a single upside to abandoning this treaty against the advice and wishes of our allies, other than for the people who never liked this treaty and don't like the idea of the transparency and openness the treaty provides," Bell said.

The U.S. has been working on a proposal to share with partners and allies imagery the U.S. would have shared from its Open Skies flights, said senior administration officials, who spoke on condition of anonymity to explain Trump's decision.

Last month, top Democrats on the Foreign Affairs and Armed Services committees in the House and the Senate wrote to Trump accusing the president of "ramming" a withdrawal from the treaty as the world grapples with COVID-19. They said it would undermine U.S. alliances with European allies who rely on the treaty to keep Russia accountable for its military activities in the region.

This month, 16 former senior European military and defense officials signed a statement supporting the treaty, saying a U.S. withdrawal would be a blow to global security and further undermine the international arms control agreements.

If the U.S. and Russia exit, all U.S. and Russian territory would be off limits to the overflights. That prompts arms control experts like Steve Pifer at the Brookings Institution to ask "What would be the point?" On the other hand, he said, Moscow could opt to stay in the treaty, which would at least allow it to continue overflights of American facilities in Europe.

Senior administration officials said Russian violations include restricting flights over Moscow and Chechnya and near Abkhazia and South Ossetia. Russian restrictions also make it difficult to conduct observation in the Kaliningrad, a Russian enclave sandwiched between Lithuania and Poland that is home to Russia's Baltic fleet, they said.

Russia uses illegal overflight restrictions along the Georgian border in support of its propaganda narrative that the Russian-occupied enclaves of Georgia are independent countries.

<https://www.voanews.com/archive/trump-us-may-rethink-decision-exit-open-skies-surveillance-treaty>

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Radio Free Europe Radio Liberty

## **U.S. Ends Sanctions Waivers on Iran's Civilian Nuclear Program**

By RFE/RL

May 27, 2020

The United States will end sanctions waivers that allow Russian, Chinese, and European firms to carry out civilian nuclear cooperation with Iran, effectively scrapping the last remnants of 2015 Iran nuclear deal.

Secretary of State Mike Pompeo said on May 27 that Iran's continued "nuclear brinkmanship" by breaching some of its nuclear commitments did not justify renewing the waivers.

"The regime's nuclear extortion will lead to increased pressure on Iran and further isolate the regime from the international community," he said.

Nonproliferation experts say that the waivers give international experts a valuable eye into Tehran's nuclear activities and that its scientific research is for legitimate civilian purposes, such as medicine.

The U.S. move may also further ratchet up tensions with other signatories to the Iran nuclear deal who have tried to salvage it – Russia, China, France, Germany, and Britain – at a time Washington is seeking their cooperation to extend a UN arms embargo on Iran.

President Donald Trump withdrew from the Iran nuclear deal, also known as the Joint Comprehensive Plan of Action (JCPOA), in 2018 and reimposed crushing sanctions on Tehran. In response, Iran has breached several provisions of the JCPOA at the fringes, saying that it can reverse them if other parties to the deal come back into compliance.

"Ending the waivers puts the remaining parties to the deal in a tough spot -- proceeding with the projects risks U.S. sanctions, but halting work puts them in violation of their obligations under the nuclear deal and gives Iran further justification to violate the accord or withdraw from it all together," Kelsey Davenport, the director for nonproliferation policy at the Arms Control Association, told RFE/RL.

The end of the "civilian-nuclear cooperation" waivers applies to international work at Iran's Arak heavy water research reactor, the provision of enriched uranium for the Tehran Research Reactor,

and the transfer abroad of spent and scrap reactor fuel. Companies involved at these facilities now have a 60-day wind-down period to cease operations or face sanctions.

The Trump administration also provided a 90-day extension for the waiver covering international activity at the Bushehr Nuclear Power Plant to ensure safety of operations.

The international civilian cooperation parts of the JCPOA were designed to make Iran's nuclear program more transparent and less capable of producing weapons.

Iran hawks in Congress and the Trump administration say the civilian nuclear waivers allow Iran access to technology that could be used for nuclear weapons. But in extending the waivers in the past, the Trump administration implicitly recognized the nonproliferation benefits of the civilian projects.

Critics of the Trump administration say that its policy of "maximum pressure" has failed to convince Iran to negotiate a "better deal." Instead, the strategy is to completely eliminate the nuclear accord, making it harder for other signatories or a future president to reenter the JCPOA.

"It's is clear that this is a political decision by an administration bent on killing the nuclear deal, irrespective of the consequences," Davenport said. "Trump's action shows a blatant disregard for the security concerns of U.S. allies and partners and further undermines U.S. credibility."

<https://www.rferl.org/a/iran-nuclear-us-pompeo-sanctions/30638361.html>

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# COMMENTARY

The Hill (Washington, D.C.)

## **This is No Time to Go Wobbly on Missile Defense**

By James Durso

May 23, 2020

As the U.S. starts to recover from the coronavirus it must not neglect the ongoing political competition in Asia, which hasn't been working from home while Americans were worrying about hand sanitizer and social distancing.

The National Defense Authorization Act (NDAA) for Fiscal Year 2020 continued Congress's bipartisan support for effective missile defense but, as Michaela Dodge of the National Institute for Public Policy notes, the NDAA diverges from the Trump administration's 2019 Missile Defense Review (MDR) in that it "appears to discourage building missile defense capabilities against sophisticated threats" — i.e. Russia and China — and relegates it to countering "the developing and increasingly complex missile threat posed by rogue states" i.e., Iran and North Korea.

Though proponents of the line that Russia and China are deterred by strategic nuclear forces, while Iran and North Korea are deterred by missile defense, say the policy hasn't changed, this creates a tiered system of threats that may eventually be reflected in different funding priorities.

General John Hyten, Vice Chairman of the Joint Chief of Staff, spoke of U.S.-based missile defenses and he was pretty clear: "They are built for North Korea, they're not built for anything else."

The nuclear forces the NDAA says are needed to deter Russia and China are strategic nuclear forces and comprise ballistic missiles launched from submarines and land-based silos, and nuclear weapons delivered by heavy bombers, such as the B-2 and B-52. These programs have significant constituencies in the military and industry, and on Capitol Hill, and will be framed as necessary to the administration's policy of "great power competition," giving them an edge in contests for budget dollars.

America's ground-based missile defense is built around the Ground-Based Midcourse Defense (GMD) system. It is comprised of 44 interceptors based at Fort Greely, Alaska and Vandenburg Air Force Base, California. Plans for another 20 GMD interceptors were scrapped in favor of a leap-ahead effort to develop and deploy the Next Generation Interceptor (NGI) by 2030, but even that system will leave the Eastern seaboard undefended.

Development of NGI will have to manage both the technical risk and budget pressures due to the budgetary demands of stimulus spending to offset the effects of the coronavirus. If the schedule slips for financial or technical reasons, the U.S. may have to consider fielding more of the existing GMD vehicles. As slippage will likely happen, does the U.S. want to wait more than a decade when, in the near term, it could augment the existing GMD inventory with 20 more interceptors?

This uncertainty comes at a time when Iran and North Korea continue to develop their missile capability.

Iran recently announced it launched a satellite on a rocket powered by a second-stage solid fuel motor. What's of concern is that the satellite launch was conducted by the Islamic Revolutionary Guard Corps, a designated terrorist organization, not Iran's civilian space program.

North Korea continued its missile test program in 2019, conducting launches on ten separate occasions, usually involving more than one missile, and it “continues to openly threaten the United States with nuclear-capable ICBMs.”

America’s near-peer competitors, Russia and China, are developing hypersonic weapons with an eye to overwhelming any missile defense system the U.S. may field, and they have continued to refine their existing inventory of intercontinental ballistic missiles.

The threat of an accidental launch from Russia and China is less than in Iran and North Korea, and, in Russia’s case, the risk can be further reduced by taking up Moscow’s offer to restart negotiations to renew the New START nuclear arms treaty.

The obscurantist regimes in Tehran and Pyongyang combine a blinkered view of the world with one-man rule, so there’s a greater chance a leader may strike because of a desire for revenge or a perceived opportunity. In the case of North Korea, the recent disappearance of leader Kim Jong-Un caused weeks of speculation about his health and the country’s leadership succession, underscoring how this nuclear-armed state relies on the health of one man, which does not make for a robust nuclear command and control system.

And though Russia and China have institutionalized launch procedures, the U.S. shouldn’t discount the possibility they might engage in a limited, coercive use of nuclear weapons to secure a political goal in Europe or Asia.

To reduce risk, the U.S. should consider adding additional GMD interceptors as a hedge against NGI schedule slippage. And it should use the 2021 NDAA to make it the policy of the United States that missile defense isn’t just a cure for “rogue state” misbehavior but will secure the U.S. homeland against adventurism or errors in Moscow or Beijing.

James Durso (@james\_durso) is the Managing Director of Corsair LLC, a supply chain consultancy. He was a professional staff member at the 2005 Defense Base Closure and Realignment Commission and the Commission on Wartime Contracting in Iraq and Afghanistan. Mr. Durso served as a U.S. Navy officer for 20 years and specialized in logistics and security assistance. His overseas military postings were in Kuwait and Saudi Arabia, and he served in Iraq as a civilian transport advisor with the Coalition Provisional Authority. He served afloat as Supply Officer of the submarine USS SKATE (SSN 578).

<https://thehill.com/opinion/national-security/499313-this-is-no-time-to-go-wobbly-on-missile-defense>

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

## **The Pacific Deterrence Initiative: Peace through Strength in the Indo-Pacific**

By Sen. Jim Inhofe and Sen. Jack Reed

May 28, 2020

The credibility of American deterrence rests on a simple foundation. America prevents wars by convincing its adversaries they cannot win. Secretary of Defense Jim Mattis said it succinctly: Deterrence is achieved when the enemy decides, “Not today. You, militarily, cannot win it, so don’t even try it.” Currently, in the Indo-Pacific, that foundation of deterrence is crumbling as an increasingly aggressive China continues its comprehensive military modernization.

This is not a partisan issue. Five years ago, Secretary of Defense Ash Carter warned that China was modernizing its military “to try to close the gap and erode our superiority in every domain.” Then, two years ago, Mattis assessed that’s exactly what happened, stating that America’s “competitive edge has eroded in every domain of warfare ... and it is continuing to erode.” Even more bluntly, the bipartisan National Defense Strategy Commission report cautioned, “America’s military superiority...has eroded to a dangerous degree” to the point that “the U.S. military could lose the next state-versus-state war it fights.”

The best way to protect U.S. security and prosperity in Asia is to maintain a credible balance of military power. But America’s ability to do so is at risk. And it’s not just U.S. interests at stake. Allies and partners in the Indo-Pacific are watching closely, and wondering whether they will be able to count on America.

With the stakes so high, the time for action is now. That’s why this year we intend to establish a Pacific Deterrence Initiative in the National Defense Authorization Act for Fiscal Year 2021. The Pacific Deterrence Initiative will enhance budgetary transparency and oversight, and focus resources on key military capabilities to deter China. The initiative will also reassure U.S. allies and partners, and send a strong signal to the Chinese Communist Party that the American people are committed to defending U.S. interests in the Indo-Pacific.

#### What the Pacific Deterrence Initiative Will Do

The Pentagon is taking challenges in the Indo-Pacific seriously, and has made some important progress implementing the National Defense Strategy in the region. That’s especially true when it comes to rebuilding readiness and investing in modernization. Unfortunately, the progress to date has been insufficient to achieve the “urgent change at significant scale” that is required. The Pacific Deterrence Initiative will improve the implementation of the National Defense Strategy in the Indo-Pacific, and incentivize the Pentagon to better prioritize the region in its annual budget process.

First, the Pacific Deterrence Initiative will enhance budgetary transparency and congressional oversight. The National Defense Strategy refocused the Pentagon on strategic competition with China and Russia, elevating the priority of the Indo-Pacific and European theaters. But while translating regional priorities into budget priorities is a critical aspect of implementing the National Defense Strategy, it’s also a major challenge for the current Pentagon budget process.

The one notable exception is Europe. The European Deterrence Initiative, created in 2014 to respond to rising threats from Russia, provides a snapshot of the key efforts the Defense Department is taking to deter aggression in the theater. The detailed budget justification materials for the European Deterrence Initiative allow Congress to track these efforts over time, assess their progress, and make adjustments when necessary.

The Pacific Deterrence Initiative would serve the same purpose, allowing Congress and the Pentagon to view the defense budget through a regional warfighting lens while increasing the visibility of options to advance U.S. priorities in the Indo-Pacific.

Second, the Pacific Deterrence Initiative will focus resources on key capability gaps to ensure U.S. forces have everything they need to compete, fight, and win in the Indo-Pacific. The current budget process has been heavily tilted towards investments in modernization and readiness. Both are absolutely necessary, but ultimately insufficient on their own to achieve the goals of the National Defense Strategy.

In particular, the Pentagon’s investments in modern platforms have not been sufficiently matched by investments in the joint and enabling capabilities those platforms require, especially as envisioned by new operational concepts. Posture and logistics remain serious weak spots for credible American deterrence in the Indo-Pacific region, a major point of emphasis in the National

Defense Strategy, as well as a recent assessment submitted to Congress by the commander of Indo-Pacific Command, Admiral Phil Davidson.

Investments in theater missile defense, expeditionary airfield and port infrastructure, fuel and munitions storage, and other areas will be key to America's future force posture in the Indo-Pacific. As one example, it doesn't matter how many F-35s the military buys if very few are stationed in the region, their primary bases have little defense against Chinese missiles, they don't have secondary airfields to operate from, they can't access prepositioned stocks of fuel and munitions, or they can't be repaired in theater and get back in the fight when it counts. The Pacific Deterrence Initiative will incentivize increased focus on posture and logistics, and help measure whether these requirements are being matched with resources.

More broadly, we hope that the Pacific Deterrence Initiative will help reorient the Pentagon's approach to planning and budgeting. The United States needs to shift the balance from the current focus on platforms and programs toward the specific missions its warfighters may be called upon to perform. A mission-oriented approach will bring more attention to the joint and enabling capabilities that are essential to their success.

Third, the Pacific Deterrence Initiative will reassure allies and partners of America's commitment to the Indo-Pacific region. We hear over and over again from foreign counterparts that they are hedging their bets for the future because they don't know if they can count on the United States. Congress took a major step forward with the Asia Reassurance Initiative Act, which clearly outlined U.S. policy and interests in the region on security, economics, and human rights and boosted resources for the State Department and U.S. Agency for International Development (USAID). The Pacific Deterrence Initiative will be a complementary effort focused on the Department of Defense to demonstrate that America's commitment to the region is bipartisan and enduring. By increasing security assistance resources dedicated to the Indo-Pacific, the Pacific Deterrence Initiative will help U.S. allies and partners build the capabilities they need to protect their sovereignty. And the initiative will assure U.S. allies and partners that they will not face the threat of Chinese coercion or aggression alone.

Fourth, and finally, the Pacific Deterrence Initiative will help deter Chinese aggression by strengthening the credibility of American deterrence. The initiative will focus resources on efforts to convince the Chinese Communist Party that there is no quick, easy, or cheap victory to be had against the American military. A well-distributed posture will complicate Chinese targeting of U.S. forces and infrastructure. More capable missile defenses at American bases will make them more difficult and costly to strike. Greater numbers of combat-credible U.S. forces in the Indo-Pacific will make it harder for China to seize and maintain the advantage early in a conflict. More resilient logistics will make it harder to take U.S. forces out of the fight or delay reinforcements. New land-based, long-range strike capabilities will provide a new source of resilient and survivable U.S. power projection. The Pacific Deterrence Initiative will focus resources on these efforts and others with the aim of injecting uncertainty and risk into Beijing's calculus, leaving just one conclusion: "Not today. You, militarily, cannot win it, so don't even try it."

#### The Pacific Deterrence Initiative is Only a First Step

The Pacific Deterrence Initiative will not be a panacea. It will not solve every military problem America faces in the Indo-Pacific, let alone the numerous non-military challenges the United States faces there. It is clear that China presents a challenge that requires a comprehensive response that includes a focus on economic security, international development, diplomacy, human rights and democratic norms, and multilateral cooperation. Moreover, while the Pacific Deterrence Initiative is a regionally-focused initiative, we recognize that the challenge from China is global in scale. But it is an essential step to reorganize U.S. thinking and resources around the key priorities for the joint

force, and restore the credibility of American deterrence in the Indo-Pacific. The Pacific Deterrence Initiative will help ensure that America's adversaries know that whether it's today or tomorrow, there will never be a good day to test America's military.

Jim Inhofe is a U.S. senator from Oklahoma and is the chairman of the U.S. Senate Armed Services Committee.

Jack Reed is a U.S. senator from Rhode Island and is the ranking member of the U.S. Senate Armed Services Committee.

<https://warontherocks.com/2020/05/the-pacific-deterrence-initiative-peace-through-strength-in-the-indo-pacific/>

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Bulletin of the Atomic Scientists (Chicago, Illinois)

### **The New START Verification Regime: How Good Is It?**

By Rose Gottemoeller

May 21, 2020

The verification regime of the New START Treaty has again come under fire in recent weeks. As Marshall Billingslea, President Trump's new special envoy for arms control, said in a recent Washington Times interview, "The Obama administration negotiated a very weak verification regime. It really has very little of what the original START treaty contained and has significant loopholes in the way verification is physically conducted, which the Russians have been exploiting. So those behaviors also have to stop."

This comment is odd, first because Trump administration officials have repeatedly acknowledged the security benefits of New START. Also, not a month earlier, the State Department released its annual compliance report, in which the entire US government, including the White House, agreed that Russia is in full compliance with New START.

The argument that Billingslea made also popped up during the treaty's ratification debate in 2010: New START is inadequate because it does not replicate the verification regime of the 1994 Strategic Arms Reduction Treaty (START).

Indeed, the New START verification regime does not replicate all the measures contained in the earlier agreement, and for very good reason: New START made good use of what worked in previous treaties, but it did not perpetuate problems encountered in implementing those treaties. New START contains detailed, streamlined procedures that make inspections reliable in confirming information that the Russians provide to the United States, and, of course, vice versa. It is precisely this carefully crafted verification regime that has made the treaty, which limits each nation's strategic nuclear arsenals at no more than 1,550 deployed nuclear warheads and 700 delivery platforms, so effective and trustworthy.

The purpose of verification. To get our arms around this debate over New START's verification procedures, a couple of basic points need to be understood from the outset:

First, the verification regime of any arms control treaty must be effective. That means, according to a definition laid down long ago by Paul Nitze, that the monitoring procedures must be good enough to detect cheating in time to do something about it—before the cheating party gains a strategic advantage. In other words, verification regimes must not tempt either side to try an illicit treaty break-out.

Second, the verification regime must be designed to monitor the obligations of a particular treaty; the information gathered is limited to that goal. It is not the same as intelligence collection, where we want to maximize the amount of information gathered about the other party's weapon systems.

Third, there is no "one size fits all" or "best and only" way to go about ensuring that both sides are living up to a treaty. Sometimes measures that are needed in a particular treaty no longer make sense when they are fast-forwarded to a new treaty that goes about limiting nuclear weapons in a different way. Governments also should have the freedom to decide when improvements to verification must be made.

Early on in the New START negotiations, those of us on the US team came to the conclusion that we could improve knowledge of actual warhead deployments if we could dispense with the counting rules that had dominated earlier arms control treaties, including START. The counting rule for ICBMs, for example, designated each missile of a type to have a certain number of warheads, determined by the maximum number that had been observed in flight testing. In that way, the Soviet SS-18 heavy missile was determined to have 10 warheads, although its carrying capacity is much greater—by some reckoning 14 or even more.

This approach came to penalize the US submarine-launched ballistic missiles (SLBMs), which according to the START counting rule could carry eight warheads each. In fact, the United States had decided to download the SLBM force, so actual warhead deployments on each missile were sometimes no more than four. As a result, the START database showed higher numbers of US submarine warheads than actually existed on the missiles: Our SLBMs were being over-counted. We wanted to fix that problem—a matter important to the Defense Department and the US Navy.

In other words, we needed to ensure that the verification measures were tailored to the limits of the new treaty, and did not simply replicate START in a way that had no purpose for this treaty.

Here was where the great telemetry debate began. The sharing of telemetry data, essentially flight test data for missiles, had an important function under START, because it was used to confirm the viability of the counting rules: a missile was considered to carry the maximum number of reentry vehicles for warheads with which it had been tested. The way each side confirmed that maximum number was to exchange telemetry data about flight tests under detailed START procedures.

In New START, we discarded the counting rules in favor of confirming declared warheads on the front of missiles through reciprocal inspections; in fact, we did not need telemetry measures to confirm compliance with the warhead limits in the new treaty. Nevertheless, the importance of telemetry was hotly debated during the course of the negotiations and afterwards, during the ratification fight for New START in the Senate. In the end, we did agree to telemetry measures with the Russians. They became an important confidence-building aspect of the treaty during its implementation, when both sides exchange telemetry data on an annual basis, on a select number of missile flight tests.

That is to say: The New START methods for confirming warhead numbers were indeed different from what had been contained in the old START. They were better because they got us a more accurate accounting of warheads.

Monitoring missile production. Another issue that was hotly debated during the New START ratification fight involved what was known, rather clumsily, as Perimeter Portal Continuous Monitoring (PPCM) at the Votkinsk Missile Production Plant about 630 miles northeast of Moscow. When START was negotiated in the late 1980s and early 1990s, both the Soviet Union and the United States thought that they would be deploying mobile ground-launched intercontinental ballistic missiles. The two countries would therefore need to be able to distinguish such

intercontinental-range missiles from mobile ground-launched intermediate-range missiles, which were banned by the Intermediate-Range Nuclear Forces Treaty (INF).

Both sides agreed to continuous monitoring at production plants, the Soviets at Votkinsk, the Americans at the Thiokol Corporation missile plant in Promontory, Utah. The purpose of the monitoring was to ensure that no intermediate-range missiles were being produced under cover of the intercontinental missile production runs.

At the end of the day, the United States cancelled its mobile missile program, so monitoring at Thiokol was not needed. At Votkinsk, however, monitoring went on from the time START entered into force in 1994. It involved American teams actually living in Votkinsk, the city adjacent to the plant, and continuously monitoring the missiles exiting the plant, according to strict procedures that were worked out in the START verification regime.

It was an expensive program for the United States to implement, and by 2009 it had been in place for almost 20 years. The inspectors were not seeing any new SS-20s, the Russian ground-launched intermediate-range ballistic missile. In the meantime, the verification regime of INF had been wrapped up in 2001; no other on-site monitoring of potential INF missiles was underway.

Because of the Russian INF violation that emerged in 2011, one might argue today that we were wrong to dispense with missile production monitoring in New START. However, the Russians were careful to center their INF-violating program on the 9M729 cruise missile, which is not produced at Votkinsk. The new ballistic missile that potentially is of INF range, the RS-26, was tested to intercontinental range and would therefore be counted and captured in New START. Indeed, the Russians offered to exhibit it as a New START system. Thus, an expensive monitoring program would have continued to operate at Votkinsk for an additional 10 years, with no treaty purpose.

Another important factor in our considerations during New START negotiations involved national technical means of verification, a combination of satellites, ground-based radars, and aircraft through which the United States monitors the Russian nuclear arsenal. The Russians, of course, deploy the same kinds of monitoring systems to keep track of US systems. From the earliest days of negotiated nuclear arms control in the 1970s, noninterference with national technical verification has been a basic principle to which both sides can agree.

“Noninterference” means that the Russians, for example, will not drape nets over their mobile missiles to prevent clear satellite pictures. If they do, they will be called on it.

Noninterference with national technical verification was one of the earliest and easiest points of agreement in the New START negotiations. So US and Russian officials both understood that we would continue to monitor Russian missile flight tests for range, to catch violations. Indeed, that is what happened with our discovery that the Russian 9M729 missile is a violation of the INF Treaty. It would not have been caught by on-site presence at the Votkinsk Missile Production Plant.

Innovating toward better verification. Dispensing with the counting rules for ICBMs and SLBMs was the most important innovation in New START. We thought long and hard about how to confirm the number of warheads that we or the Russians would declare on an individual missile. The basic breakthrough was the ability to physically check and count what was on the front end of each type of missile, which we accomplished through reentry vehicle on-site inspection. Inspectors would be given the opportunity to count objects on the front ends of missiles, which would be opened up but covered with a soft or pliable cover so that objects could be counted without revealing their technical characteristics

One problem was that every object on the front end of a missile is not a nuclear warhead. Both sides deploy penetration aids, chaff dispensers or decoys that are used to spoof missile defenses. They are conventional, not nuclear, objects. To differentiate between them, we came up with an idea:

Inspectors would be able to use radiation detection devices to determine that an object was non-nuclear in nature. In other words, an inspector would be able to confirm the number of nuclear objects declared; if there were extras, he would be able to determine that they were not nuclear warheads.

It sounds easy, but figuring out the process required complex and difficult discussions. For example, how pliable should the soft cover be that is used during the inspections? There could be no possibility that a warhead was hiding under a cover that did not properly display all of the objects underneath. What kind of radiation detector could be used? Both sides were resolved that the detection equipment should be able to determine that an object is non-nuclear, but not discover any design secrets in the adjacent warheads. Many technical discussions ensued, leading to detailed procedures so that each side could check and accept the other's detection equipment.

The United States and Russia also had to determine the selection process for missile inspections. Clearly, neither country would want inspectors to have access to every single missile in a unit. Such extensive access would prolong an inspection to such a point that base operations would be seriously impeded. Foreign inspectors on site for so long would also potentially endanger secrets that each side wants to keep. In the end, we went with usual inspection practice, wherein the inspecting party gets to select at random the missile to be inspected.

Re-entry vehicle on-site inspection has now been tested in practice during New START implementation, and it has allowed the United States to get away from the problem of over-counting warheads on submarine-launched ballistic missiles. It has also opened the door to the further possibility of warhead inspections in future. Earlier arms control treaties had focused on counting delivery vehicles and launch systems—missiles, submarines, bombers—because they were large objects that could be easily counted, even from outer space. Warheads were constrained by dint of their association with their delivery vehicles—the counting rules. Once the delivery vehicles were eliminated, the warheads went into storage and so were no longer considered a threat.

Such an approach also meant that we could not, or did not try, to distinguish conventional from nuclear missiles. Getting direct access to the missiles to determine if they were nuclear or conventional was considered too sensitive. For that reason, the INF Treaty, although it has nuclear in its name, banned all ground-launched missiles between 500 and 5,500 kilometers in range—conventional and nuclear. Moving away from the counting rules and focusing on confirming what is actually on the front end of missiles was a big change from the past, an innovation that opens up new opportunities for future arms control agreements. In particular, banning or limiting nuclear warheads while letting conventionally armed missiles continue to be deployed becomes an option.

In the same way, it opens up new opportunities for limiting non-strategic nuclear warheads, since we have now gained practical experience monitoring non-nuclear objects that are “cohabitating” with nuclear warheads. The techniques and monitoring equipment that have been used in New START will have applications in discerning nuclear from non-nuclear objects in other settings. For example, a country engaging in a non-strategic nuclear arms control regime could use procedures born of the New START experience to prove that a storage facility was not housing nuclear warheads. Non-strategic nuclear weapons limitations have been the Holy Grail of the arms control community for a long time; re-entry vehicle on-site inspection in New START has begun to make such limits more feasible and practical.

Innovation No. 2: Inspection system overhaul. Another aspect of New START verification that has been hotly contested is the number and types of inspections it requires. START had a wide array—12 different types adding up to 28 total inspections. They were divided into categories: 15 data

update inspections, 10 reentry vehicle inspections, three inspections of formerly declared facilities. Suspect sites could also be inspected, but it would have to be under the data update quota.

From the US military's perspective, the START inspection regime was far from perfect. Nuclear base commanders were particularly concerned about the impact on their operating tempo. Bases essentially have to shut down operations while the foreign inspectors are on site. Sometimes the shut-down can stretch for days as the site is prepared, the inspectors arrive and carry out their monitoring work, and a post-inspection assessment is done after they leave. Such delays are expensive propositions, especially when one inspection follows hard on the heels of the previous one, as was permitted under START. The delays were especially hard on the strategic submarine force, which operates on strict schedules for at-sea deployments.

After 15 years of START inspections, the US government, especially the Defense Department, had come to the conclusion that some of the START inspections could be combined, consolidated, or eliminated, to make New START inspections simpler, less costly, and less of a burden on nuclear base operations. Language of this kind was inscribed in the July 2009 summit statement that Presidents Obama and Medvedev signed in Moscow. It immediately aroused controversy, with US critics arguing hard that the United States was weakening the strict START verification regime, letting the Russians get away with less stringent measures and endangering US security.

Those of us on the New START team knew we had a good reason to streamline the inspection regime, but we had to make the case that we could do effective verification in a different way in New START. To accomplish this goal, we decided to set loose a team of weapon system operators from the Defense Department and seasoned inspectors from both Defense and the intelligence community. Their job was to work through the problem and develop a new solution for the inspection regime.

The team produced a dramatic new concept for verification. It consolidated the 12 different types of START inspections into two major types of inspections: inspections for deployed systems would be called Type 1 inspections and non-deployed systems would be Type 2.

In Type 1 inspections, several activities would be carried out at once, including confirming the warheads declared on reentry vehicles and ensuring the data that we had about the presence of Russian missiles at bases were accurate. Essentially, Type 1 inspections would focus on operating bases and the weapon systems present there and would be used to confirm several aspects of their status—numbers of missiles, numbers of warheads, and deployment locations.

By contrast, Type 2 inspections would focus on non-operational bases, i.e., storage and maintenance facilities, or facilities where systems were being converted or eliminated.

The beauty of this concept is that it retained all of the tasks that were present in the 12 types of START inspection, but folded them into only two. For example, START data update inspections, formerly declared facility inspections, and conversion or elimination inspections were all folded into Type 2 inspections. The inspections would take place over a longer period of time to accommodate the multiple tasks involved, but individual facilities would not be inspected so often—repeat inspections at any given base in a single year were no longer possible—thus their operations would not be interrupted so often.

Some of the ideas that the brain trust devised ended up being important endgame issues for the negotiations. For example, our defense and intelligence experts determined that if each launcher and delivery vehicle had a unique identifying number, which would be recorded in the database and tracked through constant notifications, then we would be in an improved position to monitor the Russian ICBM force on a 24/7 basis, and inspectors would have a clearer picture of what missiles should be present when they arrived at an operating base.

The Russians threw up all kinds of objections to the identifying numbers, even to the point of claiming that inscribing numbers on the sides of their missiles would interfere with missile flight. Finally, after exchanges on the matter between the Chairman of the Joint Chiefs of Staff, Adm. Michael Mullen, and the Russian Chief of the General Staff, Gen. Nikolai Makarov, and even between President Obama and President Medvedev, the two sides agreed that the existing serial numbers that each side used to track and account for their weapon systems would be used for this purpose. It was a simple solution, but one that has proven vital to the effectiveness of New START verification.

The message from this experience is a lesson that would serve well in any negotiation: Sometimes it pays dividends to turn the experts loose and let them think through a problem until they come up with a solution that works for all. We were lucky to have an experienced team lead, Ted Warner, who was the senior representative of the Secretary of Defense to the negotiations. He knew a great deal about past arms control regimes but was not so wedded to the old ways that he would not consider how to adjust them to new circumstances.

In addition, the dynamics among the US experts were important: The weapons systems operators knew the operational costs that inspections could impose, and the inspectors knew what they needed to verify that treaty commitments were being respected. The kind of “creative combat” that ensued ensured that the United States got exactly what it needed from New START: effective verification at a reasonable cost to US operational tempo.

The value of New START verification. In the end, the United States got what it wanted in the New START verification regime: streamlined inspection procedures at a sufficient level of detail to be effectively implemented. We made good use of what had been in previous treaties, but we were not trapped into perpetuating problems, such as over-counting of warheads, that were not in the interest of the United States. Most important, we ended up with detailed procedures that make the inspections reliable in confirming information that the Russians provide us. The same, of course, goes for them, since everything is done on a reciprocal basis.

The New START verification regime has a bigger value than the treaty itself: It bodes well for future arms control regimes that focus more on accounting for warheads, nuclear or conventional, than has been possible in the past. For anyone interested in pursuing limitations on non-strategic nuclear warheads, as the current administration is, this should be good news. Not only should we continue to implement the treaty, but we should also be studying the lessons that can be learned from it. Thanks to New START, a long-sought goal of nuclear arms control—controlling and eliminating warheads—is finally within our grasp.

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Australian Strategic Policy Institute (Barton ACT, Australia)

## **Nuclear-armed Submarines and US Defence Strategy: The Future of the Maritime Deterrent**

By James J. Wirtz

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Today is an age of acceleration, a time when Moore’s Law is creating profound changes at diminishing intervals, making it difficult to anticipate strategic, social and technological developments. Some organisations facing these cascades of change, however, continue to plan for the Keynesian long term by adopting programs intended to endure for many years. One of those

organisations is the US Navy, which sails a steady course, stabilised by personnel and program cycles and equipment lifetimes that unfold over several decades.

As a result, the United States has a plan and an existing program to maintain a nuclear deterrent onboard a nuclear-powered ballistic missile submarine (SSBN) fleet until the end of the 21st century. Unless strategists truly encounter a black swan at sea—an unanticipated event that shifts the course of history in significant ways—the US Navy will have 12 nuclear-capable Columbia class submarines by the early 2040s.

What explains this steadfast commitment to the SSBN in US nuclear strategy and how might it change?

SSBNs are extremely complex and costly machines that require highly trained and dedicated crews to operate in a most unforgiving environment. On a cost per warhead basis, they are probably the most expensive nuclear-weapon-basing scheme in existence. Americans are true aficionados when it comes to deterrence theory—they have taken the great works to heart and embrace the notion that the ability to hold targets at risk after suffering a nuclear attack or some other destructive insult is the sine qua non of nuclear deterrence.

The US national security establishment is in complete and enduring agreement about the imperative of maintaining the SSBN/SLBM (submarine-launched ballistic missile) system. Both the Obama administration's (2010) and the Trump administration's (2018) nuclear posture reviews used virtually the same language to describe the benefits of retaining SSBNs as part of the nuclear deterrent: survivability, no near-term or medium-term threats, and the ability to upload warheads as a hedge against potential threats or failures affecting the other two legs of the US nuclear triad.

Which trends and black swans could affect the US SSBN program? The latest Congressional Research Service report (October 2019) on the Columbia-class SSBN highlights several issues confronting the program. Cost uncertainty, cost growth, scheduling and technical risks, and the fact that the Columbia-class program is linked to the British program to build the Dreadnought-class SSBNs are depicted as problems that could cause a delay in reaching an initial operational capability scheduled for 2031.

These types of problems often complicate big-ticket weapons programs, but the Columbia class is also part of an enduring trend—specifically, the steady decline in the size of the US SSBN fleet.

The US deployed 31 Lafayette/Benjamin Franklin-class SSBNs and 18 Ohio-class SSBNs, and is now planning on 12 Columbia-class boats. Admittedly, the Ohio class carried more missiles (24) than earlier classes, but the Columbia class is designed to carry only 16 SLBMs.

This reduction in the size of the SSBN force thus mirrors the overall reduction in the size of the US strategic deterrent, which is down from about 10,000 deployed warheads at the end of the Cold War to the New START Treaty level of 1,550 deployed warheads. Each new generation of US SSBN contains approximately 40% fewer ships than its predecessor.

If this trend continues, the next class of SSBN, which would be under development around 2060, would contain only seven boats, which would yield an incredibly high cost per deployed warhead. Given the many decades spanned by the Columbia-class program, what amounts to a trend towards disarmament might undermine support for the SSBN in the outyears. There's a chance that some combination of the high cost of deploying so few warheads on such an expensive system and the perception of diminished need might make the Columbia class the last US SSBN.

The longevity of the Columbia-class program is also an anomaly in an age of acceleration. The combination of longevity and acceleration creates a setting where the emergence of a black-swan threat to the program appears likely.

These black swans might have innocuous beginnings, such as CubeSats revealing SSBN operational signatures that have so far remained unobserved. Alternatively, more deliberate technological innovation, such as artificial intelligence, might yield ways to identify SSBN operational signatures that remain unknown.

There might also be brute-force solutions to submarine surveillance—given sufficient computational power, the oceans might become increasingly transparent. Deliberate cyberattacks, cyber context (for example, unintended and unauthorised interaction between classified and public computer and communication networks), autonomous/robotic anti-submarine weapons, nanotechnologies, nanoenergetics and various forms of insider threats alone or in unanticipated combinations could potentially pose a threat to the SSBN.

Regardless of its technological or operational origins, a black swan that undermines the survivability of the SSBN will greatly undermine support for the SSBN/SLBM system. Survivability is the strength and the Achilles' heel of the SSBN. The extraordinary cost of this nuclear-weapon-deployment scheme is only justified on the basis of survivability, and anything that calls that survivability into question will undermine support for the SSBN.

This sort of development, however, would have far-reaching consequences because the US would be forced to undertake profound operational and materiel responses across its deterrent force to compensate for the emerging threat to its primary nuclear second-strike capability.

There's a paradox hovering around any assessment of the future of the US SSBN fleet. On the one hand, the US political and strategic commitment to the SSBN is firm and abiding. On the other hand, acceleration produces profound technological, social and political changes at diminishing intervals, placing a premium on rapid innovation, adaptability and diversity of systems that can respond to an increasingly chaotic environment.

The SSBN bucks this trend. It is a big-ticket item that resists modification. It is intended to last for decades. The SSBN places the US secure second-strike capability into a few extremely expensive baskets despite the fact that trends in just about every other industrial and technological domain favour rapid production of low-cost systems optimised to exploit short-lived technological advantages.

Oddly enough, those closest to the US SSBN programs don't seem to recognise that this paradox exists. The failure to recognise and somehow respond to this longevity-acceleration paradox might, in fact, be the greatest threat facing the future of the next generation of SSBNs.

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#### AUTHOR

James J. Wirtz is professor and dean at the School of International Graduate Studies, US Naval Postgraduate School, and works on nuclear strategy, international relations theory and intelligence. Image: US Department of Defense/Flickr.

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## ABOUT THE USAF CSDS

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

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

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

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

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