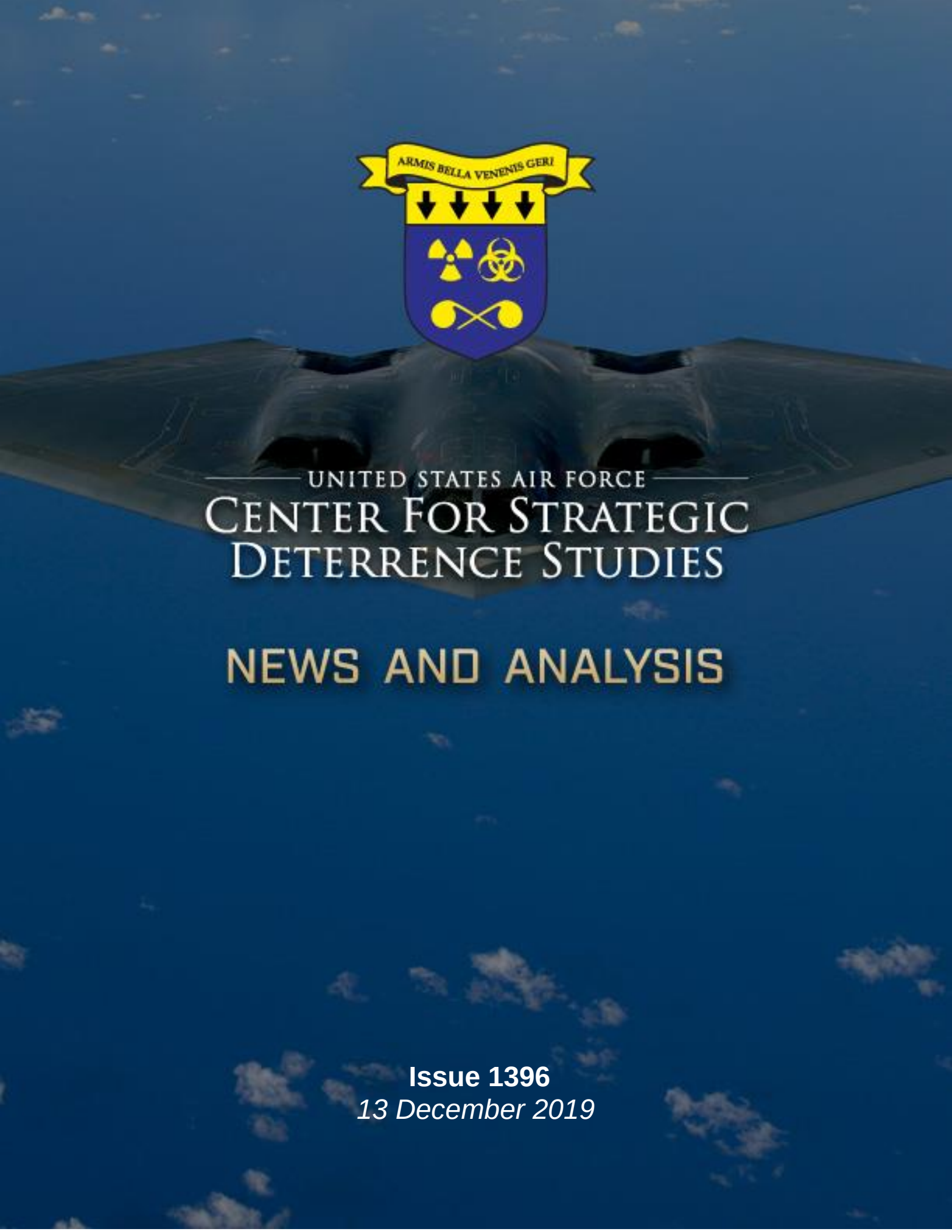
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UNITED STATES AIR FORCE
CENTER FOR STRATEGIC
DETERRENCE STUDIES
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Feature Report

"MISSILE DEFENSE: Further Collaboration with the Intelligence Community Would Help MDA Keep Pace with Emerging Threats". Published by U.S. GAO; Dec. 11, 2019

https://www.gao.gov/products/GAO-20-177

The Missile Defense Agency (MDA) uses information from the intelligence community to determine how to design and test its weapon systems.

[GAO] found that MDA has recently increased its interaction with the intelligence community, but further collaboration could help MDA keep pace with evolving threats. For example, MDA has previously relied on some outdated threat information, risking its weapon systems' performance. MDA can improve how it prioritizes requests for threat information to ensure it gets the needed information on time.

[GAO] made recommendations to improve how MDA interacts with and leverages information from the intelligence community.

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NUCLEAR WEAPONS

Defense News (Washington, D.C.)

Nuclear Deterrent Still the US Navy's Top Priority, No Matter the Consequences, Top Officer Says

By David B. Larter

Dec. 10, 2019

WASHINGTON — The U.S. Navy's new top officer is doubling down on the service's commitment to field the new generation of nuke-launching submarines.

Adm. Michael Gilday, who assumed office as the chief of naval operations in August, visited General Dynamics Electric Boat in Quonset Point, Rhode Island, on Tuesday. He reiterated in a release alongside the visit that the Columbia-class ballistic missile submarine remains the Navy's top priority.

"The Navy's first acquisition priority is recapitalizing our Strategic Nuclear Deterrent — Electric Boat is helping us do just that," Gilday said. "Together, we will continue to drive affordability, technology development, and integration efforts to support Columbia's fleet introduction on time or earlier."

The service has been driving toward fielding the Columbia's lead ship by 2031, in time for its first scheduled deployment. Construction of the first boat will begin in October 2020, though the Navy has been working on components and design for years.

Two generations of submariner CNOs have emphasized Columbia as the service's top priority. Gilday has made clear that having a surface warfare officer in charge has not changed the service's focus.

In comments at a recent forum, Gilday said that everything the Navy is trying to do to reinvent its force structure around a more distributed concept of operations — fighting more spread out instead of aggregated around an aircraft carrier — would have to be worked around the Columbia class, which will take up a major part of the service's shipbuilding account in the years to come.

"It's unavoidable," Gilday said, referring to the cost of Columbia. "If you go back to the '80s when we were building Ohio, it was about 35 percent of the shipbuilding budget. Columbia will be about 38-40 percent of the shipbuilding budget.

"The seaborne leg of the triad is absolutely critical. By the time we get the Columbia into the water, the Ohio class is going to be about 40 years old. And so we have to replace that strategic leg, and it has to come out of our budget right now. Those are the facts."

The latest assessment puts the cost of the 12 planned Columbia-class subs at $109 billion, according to the Congressional Research Service.

Having nearly 40 percent of the shipbuilding budget dominated by one program will impact the force, which will force the Navy to get creative, the CNO said.

"I have to account for that at the same time as I'm trying to make precise investments in other platforms," he explained. "Some of them will look like what we are buying today, like [destroyer] DDG Flight IIIs, but there is also an unmanned aspect to this. And I do remain fairly agnostic as to what that looks like, but I know we need to change the way we are thinking."

Renewed push for 355

While the 12-ship Columbia-class project is set to eat at 40 percent of the Navy's shipbuilding budget for the foreseeable future, acting Secretary of the Navy Thomas Modly has renewed calls to field a 355-ship fleet.

The 355-ship goal, the result of a 2016 force-structure assessment, was written into national policy and was a stated goal of President Donald Trump.

"[Three hundred and fifty-five ships] is stated as national policy," Modly told an audience at the USNI Defense Forum on Dec. 5. "It was also the president's goal during the election. We have a goal of 355, we don't have a plan for 355. We need to have a plan, and if it's not 355, what's it going to be and what's it going to look like?"

"We ought to be lobbying for that and making a case for it and arguing in the halls of the Pentagon for a bigger share of the budget if that's what is required," Modly added. "But we have to come to a very clear determination as to what [355 ships] means, and all the equipment we need to support that." In a memo, he said he wants the force to produce a force-structure assessment to get the service there within a decade.

Modly went on to say that the Navy's new Integrated Naval Force Structure Assessment, while will incorporate Marine Corps requirements, should be presented to him no later than Jan. 15, 2020. The Navy plans to look at less expensive platforms to reach its force-structure goals, which will likely include unmanned systems. But Congress has shown some reluctance to buy into the concept because of the sheer number of unknowns attached to fielding large and medium-sized unmanned surface vessels.

The newly released National Defense Authorization Act halved the number of large unmanned surface vessels requested by the service, and skepticism from lawmakers toward the Navy's concepts appears unlikely to abate by the next budget cycle.

That means the 10 large unmanned surface vessels, or LUSV, the Navy programmed over the next five years seem unlikely to materialize at that rate. The Navy envisions the LUSV as an autonomous external missile magazine to augment the larger manned surface combatants.

But the drive to field less expensive systems to execute a more distributed concept of operations in large areas such as the Asia-Pacific region is being pushed at the highest levels of the government. In his comments at the Reagan National Defense Forum over the weekend, Trump's national security adviser said the military must rethink how it buys its equipment.

"Spending $13 billion on one vessel, then accepting delivery with elevators that don't work and are unusable is not acceptable," O'Brien told the audience, referring to the troubled aircraft carrier Ford.

"The National Security Strategy and National Defense Strategy are clear: We must be ready for an era of prolonged peacetime competition with peer and near-peer rivals like Russia and China. ... The highest-end and most expensive platform is not always the best solution."

https://www.defensenews.com/naval/2019/12/10/nuclear-deterrent-still-the-us-navys-top-priority-no-matter-the-consequences-top-officer-says/

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Aiken Standard (Aiken, S.C.)

New Defense Bill Backs Plutonium Pit Production

By Colin Demarest

Dec. 10, 2019

A $738 billion defense and energy policy bill revealed Monday night has entrenched the call for more plutonium pits, cores or triggers government officials say are needed for the country's aging nuclear weapons.

The fiscal year 2020 National Defense Authorization Act, negotiated and refined over the course of several months, supports "the U.S. Strategic Command requirement to produce 80 plutonium pits per year by 2030," according to a summary, which was published alongside a more-detailed report.

That sentiment was likely driven by the U.S. Senate. The Senate bill expressed that jumpstarting the plutonium pit production mission and establishing the proper infrastructure for it would be critical – and delays would be unacceptable.

The House version was less aggressive. Kingston Reif, the director for disarmament and threat reduction policy at Arms Control Association, said the House bill had provisions "aimed at checking the excesses of the Trump administration's nuclear modernization plans."

The proposed NDAA would authorize billions of dollars total for nuclear weapons ventures under the U.S. Department of Energy's umbrella. Such work falls to the National Nuclear Security Administration, a semiautonomous agency led by Lisa Gordon-Hagerty.

The local angle

The NNSA and the U.S. Department of Defense in May 2018 together recommended producing plutonium pits both in South Carolina and in New Mexico. At least 50 per year would be produced at the Savannah River Site, at a reworked Mixed Oxide Fuel Fabrication Facility, and another 30 per year would be made at a bolstered Los Alamos National Laboratory.

MOX, a multibillion-dollar nuclear fuel project, was canceled by the NNSA late last year. MOX had been more than a decade in the making. Costs and timelines had ballooned.

U.S. Rep. Joe Wilson, a South Carolina Republican who was involved in the House-Senate negotiations, on Tuesday afternoon hailed the National Defense Authorization Act compromise as a win. Specifically, the longtime congressman pointed to authorization of "full plutonium pit funding at the Savannah River Site" and the 80 pits per year guidance.

"I am thankful to have served on the NDAA Conference Committee for fiscal year 2020," Wilson said in a statement. "This conference's hard work led to the final bipartisan agreement released last night."

A vote on the defense authorization act – not actual funding – is expected in the House as soon as this week. It will then move to the Senate and, from there, to the president's desk. Leadership from both the House and Senate armed services panels said the goal is to move the legislation through the system expeditiously.

Trump signed the previous National Defense Authorization Act at Fort Drum, New York, to much fanfare. Wilson attended that ceremony.

https://www.aikenstandard.com/news/new-defense-bill-backs-plutonium-pit-production/article_d9aa1a8e-1b5d-11ea-9f06-c72bcbd92f30.html

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38 North (Washington, D.C.)

Resumed North Korean ICBM Testing: Possible Technical Objectives

By Vann H. Van Diepen

Dec. 9, 2019

Introduction

On December 7, North Korea claimed to have conducted a "very important test" at its Sohae Satellite Launching Station that "will have an important impact on changing the strategic position of the DPRK."[1] The North Koreans did not describe what was tested, but prior open-source imagery suggests it was a static (ground) test of a large liquid-propellant rocket engine.[2] It remains to be seen what rocket system the engine was associated with: a previously launched intercontinental ballistic missile (ICBM), intermediate-range ballistic missile, space launch vehicle, or a new system. In any case, the static test could be the precursor to a full-up flight test of an ICBM or one of these other systems. If North Korea decides or has decided to resume full-up ICBM launches, its decision almost certainly will be governed primarily by political objectives rather than programmatic factors, and tests will be conducted within parameters Kim Jong Un sets. North Korea's rocket force developers and operators presumably would do the best they could to maximize value to the ICBM research, development and deployment effort within these parameters.

This article considers the possible technical objectives that North Korea might pursue if ICBM launches are resumed, within the political parameters set by the regime. Its principal conclusions are that North Korea is most likely to seek to improve the reliability and operational effectiveness of the Hwasong-15/KN-22 with a single warhead (rather than multiple warheads), that improving accuracy is unlikely to be an objective for a near-term ICBM test campaign, that the DPRK may not demonstrate missile defense penetration aids in flight tests (either because it cannot properly evaluate such tests or in order to conceal its penetration aid [penaid] capabilities) and that a next round of ICBM testing is unlikely to feature new types of ICBM systems.

Objectives of Renewed ICBM Testing

North Korea's last launch of an ICBM was in November 2017. Starting with Kim Jong Un's remarks in April 2019, and continuing through at least December 3, North Korea has been threatening dire consequences if the US does not change its approach to denuclearization negotiations by the end of the year. These threats have both implicitly and explicitly included a potential resumption of ICBM launches. The analysis of North Korean objectives for renewed ICBM testing is hindered by the fact that we do not know when the North might resume ICBM launches, how many times it might launch or what political parameters would govern those launches. Nor do we know much about what the DPRK's 2017 ICBM tests achieved or what shortcomings in those systems remain to be addressed, much less DPRK plans for developing and deploying any further ICBM systems. Logically, however, it is possible to posit four broad technical objectives the North might seek to pursue in a next series of ICBM launches:

- improving the reliability of previously tested ICBMs and their single-warhead payloads;
- improving ICBM accuracy;
- testing new payload types, namely penetration aids or multiple-warhead payloads; and
- testing new types of ICBMs, most significantly solid-propellant missiles.

Improving Previously Tested Systems

The North conducted apparently successful launches of the 10,000 km range Hwasong-14/KN-20 ICBM on July 4 and 28, 2017, and of the larger, 13,000 km range Hwasong-15/KN-22 ICBM on November 28, 2017. This was a very small number of launches relative to the one to three dozen the US, USSR and China relied upon before deploying their first-generation ICBMs.

Based on its past practice with other ballistic missiles and reports of ongoing ICBM production and base construction, however, it is credible that North Korea could have deployed the KN-20 and/or KN-22 based solely on the limited flight testing to date. But these ICBMs almost certainly are not highly reliable at present, and the DPRK presumably understands that even a few more tests would improve their reliability and effectiveness. For example, all of the launches were on highly lofted trajectories to a much shorter ground range than a "minimum-energy," full-range ICBM trajectory; thus, the missiles' reentry vehicles (RVs) were not subjected to the thermal and mechanical stresses that would be created by a full-range flight.

Therefore, the most important and likely technical objective of a next round of ICBM launches would be to improve the reliability and operational effectiveness of the KN-20 and/or KN-22, particularly if some of these systems already have been deployed. Further launches would improve the North Koreans' confidence that these systems will perform as designed, and would provide an opportunity to verify any modifications or improvements made to address whatever shortcomings they might have perceived in the 2017 launches. At least one or two more successful tests per system would substantially advance these objectives, but the more launches, the better (all other things being equal).

Even additional lofted-trajectory flights would be useful in building confidence in the performance of the KN-20/22's launchers, booster stages, boost-phase guidance and stage and RV separation. But to address the very pressing issue of reliable performance at operational ranges and trajectories of the RV and the nuclear warhead it presumably is intended to contain, a successful full-range, "minimum-energy" trajectory flight using an operational RV and a "mock" nuclear warhead (with a stand-in for fissile material) would be ideal.

Such a launch would also, however, create the greatest political risks for North Korea, as an ICBM would probably overfly Japan in the general direction of the US and would telegraph the clear desire to increase the nuclear threat to the US homeland. Therefore, the North may stop short of conducting such launches, at least in the initial stages of a resumed ICBM launch campaign. It could avoid full-range testing if it used overdesigned (and, therefore, heavier) RVs and warheads and blunt-shaped (and, therefore, less accurate) RVs that would be highly likely to survive full-range flight, which probably would provide adequate confidence—based on likely historic North Korean standards—that an ICBM fired in anger would successfully strike targets in the US. (There also is a question about whether North Korea would be able to collect worthwhile reentry data from a full-range test without having a ship-borne collector—the existence of which currently is unknown—within line of sight of the impact area. But the North might test to full range anyway if its overriding purpose was political impact.)

A final aspect of launching previously tested systems is whether the North would launch the KN-20, the KN-22 or both. We have no real insight into the genesis or lineage of the two systems, or of how they might be related. From a purely military standpoint, however, the KN-22, with its substantially greater range/payload capability and larger-diameter payload section, would have greater military potential against the United States. Although this potential comes at the cost of greater length and weight that would make the road-mobile KN-22 harder to move around than the KN-20, the KN-22 would probably be given a higher priority for further launches.

Improving Accuracy

Low accuracy is a traditional shortcoming of longer-range North Korean ballistic missiles. Because accuracy in inertially-guided missiles degrades as a function of flight time (and thus range), this shortcoming would be even more acute for the North's ICBMs—particularly if, as is likely, it uses blunt-nosed RVs. One analyst has suggested such ICBMs would have accuracies of tens of kilometers.

Therefore, the North might seek to improve accuracy in resumed ICBM testing. It could try to reduce guidance and control errors during the boost phase of flight, and/or reduce reentry errors as the RV passes through the atmosphere.

- Boost-phase errors could be reduced by using higher-quality inertial instruments (if available), and/or by augmenting inertial guidance with satellite navigation updates (e.g., GPS) or stellar updates as in the 1970s-era Soviet SS-N-8 submarine-launched ballistic missile.
- Reentry errors could be addressed by moving to more slender, sharply-pointed RVs. But this would require using smaller-diameter and lighter nuclear warheads that are more technically challenging to build. Such RVs also are subject to higher atmospheric forces upon reentry than a blunt-nosed RV, increasing the need for successful long-range testing.
- Reentry errors also could be mitigated by using a maneuvering RV (MaRV) with terminal guidance. Doing so at ICBM range probably is beyond North Korea's current technical capability, although it has apparently tested MaRVs on short-range ballistic missiles, which is much less technically demanding.

But given North Korea's likely objective of using nuclear-armed ICBMs to threaten large US cities, extremely high accuracy would not be required. Even the currently-assumed accuracy of tens of kilometers would be sufficient. So for the DPRK, near-term accuracy improvement probably is a "nice-to-have," allowing more efficient targeting of cities and the use of smaller (and smaller-yield) warheads once available, not a "must-have." This is especially true if Kim Jong Un has political reasons to eschew full-range flights.

Testing New Payload Types

Analysts have readily noted that the KN-22's greater range/payload capability and larger diameter open up the possibility for augmenting a single RV with other payload elements, such as penaids to confuse missile defenses or multiple warheads.

Penaids

Given the existence of the US national missile defense system, which is specifically geared against DPRK missile attack, the North would have a clear motivation to deploy penaids. North Korea may also find penaids preferable to deploying large numbers of additional ICBMs in an effort to saturate US missile defenses, particularly if producing and deploying additional missile units and nuclear warheads is resource intensive. Penaids also could help mitigate the increased vulnerability to missile defenses of blunt-nosed RVs.

Penaids could take such forms as lightweight inflatable balloon decoys (and associated dispensers) that could be deployed from an ICBM in large numbers to confuse defenses about the location of the real RV during the exoatmospheric portion of flight, relatively lightweight chaff clouds (and associated dispensers) to confuse missile defense radars during exoatmospheric flight and small numbers of relatively heavy decoy RVs. Ideally, an attacker would want to thoroughly test penaids in simulated attacks against a replica of the missile defense systems' sensors. There is no evidence that North Korea has developed such a test infrastructure or conducted such testing.

However, it would be consistent with North Korea's historical missile development philosophy to deploy at least simple penaids on ICBMs without such testing—and consistent with its concealment and deception practices not to demonstrate penaids in flight testing at all to achieve surprise in wartime use (albeit at a lower level of reliability and effectiveness that would nonetheless probably be sufficient given historic North Korean standards). Thus, we may not see penaids tested in the next DPRK launch campaign even if they are to be deployed on ICBMs.

Multiple Warheads

Use of a multiple RV payload (MRVs, warheads dispensed shotgun style without being individually targeted) or multiple independently targetable RVs (MIRVs) also would help combat US missile defenses. MRVs could allow better distribution of the destructive force of nuclear weapons against cities than a larger single RV, while MIRVs could permit striking several widely separated targets using a single booster. Either MRVs or MIRVs, therefore, could theoretically provide North Korea with operational advantages, as well as a big political splash if flight tested.

Based on past US/UK and Soviet practice, one might expect to see North Korea pursue less technically demanding MRVs before trying MIRVs. MIRVing also requires using substantial payload weight for the RV-dispensing post-boost vehicle (PBV, or "bus") rather than for RVs, driving the use of smaller-diameter nuclear warheads and RVs with the technical and flight testing challenges noted above. MIRVing probably also would require substantially improved boost-phase ICBM accuracy to be cost effective. In addition, the North might consider the extent to which it wanted to put more relatively scarce nuclear warheads on fewer missiles and launchers that are potentially vulnerable to prelaunch attrition, launch failures and in-flight reliability problems.

Taking all of this into account, although multiple warheads have clear potential for the future, North Korea is more likely to focus a next ICBM launch campaign on single-warhead payloads than on multiple-warhead payloads.

Testing New Types of ICBMs

Just as there were no indications of the existence of the KN-20 and KN-22 before they were launched (although the US government reportedly may have known in advance about at least the KN-22), North Korea easily could be developing additional types of ICBMs that the US is unaware of. (The paraded but untested KN-08 and KN-14 ICBMs apparently have no better performance than the KN-20, much less the KN-22, and seem to use an inferior propulsion system based on that of the problematic Musudan intermediate-range ballistic missile. So North Korea is much less likely to continue to pursue these systems than the KN-20 and KN-22.)

A new liquid-propellant, road-mobile ICBM seems less likely at this stage given the KN-22's performance and potential for improvement. The North might well be interested in having a smaller and lighter (KN-14-sized) system that would be easier to drive around than the KN-22, if such a missile could have enough range/payload capability to be worthwhile. But that may not be technically possible for the North in the near term, although it certainly cannot be ruled out. And North Korea's long experience in road-mobile missile operations may allow it to manage KN-22 field deployments well enough that it has no urgent or near-term need to pursue a less balky liquid-propellant alternative.

More of a game changer would be the unveiling of a solid-propellant, road-mobile ICBM. Such a system could have many operational advantages, including faster reaction time, no handling requirements for toxic liquid propellants and no propellant storage and handling vehicles that make mobile missile operations harder to conceal. A solid also could avoid operational problems stemming from the relatively low boiling point and high freezing point of the liquid oxidizer used

with the more powerful KN-20/22 propulsion system. And the launch of such a missile would be another powerful political statement.

But thus far, the most capable solid-propellant system the North Koreans have launched is the Pukguksong-3/KN-26 submarine-launched ballistic missile. The missile, launched for the first time only two months ago, is assessed to have a range of 1,900 to 2,000 km using two stages of some 1.4-1.5 meters in diameter totaling some 7.8 to 8.3 meters in length. This is a far cry from the US's, USSR's and China's[3] first solid-propellant ICBMs, which reached ranges of 7,000 to 10,000 km using three stages of some 1.8 to 2 meters in diameter, totaling some 13 to 21.27 meters in length.

We should not sell North Korean missile developers short. They may, for example, be able to use filament-wound motor cases in their first solid-propellant ICBM rather than the heavier steel cases these other countries used, allowing better range/payload performance. But the challenges of building larger solid-propellant motors should not be underestimated, either. While one should fully expect North Korea to seek solid-propellant ICBMs and to flight test them at their earliest combined technical and political opportunity, it is highly unlikely that such a system would be available for flight testing in a near-term DPRK launch campaign.

The Bottom Line

North Korea's decisions about whether, when and how to resume ICBM launches almost certainly will be governed primarily by political rather than programmatic factors. Within whatever latitude they are given to shape a next series of ICBM launches, the North's rocket force developers and operators are most likely to seek to improve the reliability and operational effectiveness of the KN-22, and possibly also the KN-20. Improving ICBM accuracy is unlikely to be an objective for a near-term test campaign, which is more likely to focus on single-warhead than multiple-warhead payloads. Although the North has a clear motivation to deploy missile defense penetration aids on its ICBMs, it may not demonstrate penaids in flight tests, either because it cannot properly evaluate such tests or because it wants to conceal its penaid capabilities from the US. Finally, a next round of ICBM testing is unlikely to feature new types of ICBM systems: new liquid-propellant ICBMs probably are unnecessary in the near-term given the KN-22's potential, and North Korea probably is not technically capable of developing solid-propellant ICBMs so soon.

[1]

See: Min Joo Kim and Simon Denyer, "North Korea claims to have carried out a 'very important' test at rocket launch site," The Washington Post, December 8, 2019, https://www.washingtonpost.com/world/2019/12/07/north-korea-claims-have-carried-out-very-important-rocket-test; and KCNA, "Statement of Spokesman for Academy of National Defence Science Issued," December 8, 2019.

[2]

Because Sohae contains only a liquid-propellant rocket engine test stand (see Scott LaFoy, "It Takes a Village to Raze a Test Stand," Arms Control Wonk, June 12, 2018, https://www.armscontrolwonk.com/archive/1205394/it-takes-a-village-to-raze-a-test-stand.), some press suggestions that the test was of a solid-propellant rocket motor (e.g., Hyung-Jim Kim, "North Korea Conducts 'Important Test' at Previously Dismantled Rocket Launch Site," Time, December 8, 2019, https://time.com/5746075/north-korea-rocket-launch-test.) are almost certainly incorrect.

[3]

The DF-31 third stage was 1.5 meters in diameter compared to 2.0 meters for stages 1 and 2.

https://www.38north.org/2019/12/vvandiepen120919/

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US COUNTER-WMD

Homeland Preparedness News (Washington, D.C.)

Chemical Industry Safety, Security Guidelines Addressed during Workshop

By Douglas Clark

Dec. 10, 2019

Chemical industry officials said the Organization for the Prohibition of Chemical Weapons (OPCW) would be at the forefront of establishing guidelines promoting safety and security.

During the recent second edition of the Workshop on Developing Tools for Chemical Safety and Security at Almaty in Kazakhstan, OPCW officials met with personnel representing the Government of Kazakhstan to reaffirm the OPCW would facilitate the development of norms and exchange best practices in future capacity-building programs.

"Kazakhstan is strongly committed to continuing our efforts to mitigate chemical weapons threats, enhancing chemical security and improving the coordination of chemical security threat reduction programmes and activities across the globe," said Dastan Yeleukenov, director of the Department of International Security, Ministry of Foreign Affairs.

The forum, which was attended by 21 experts from OPCW Member States, served as a cross-sector partnership in chemical safety and security management for the chemical industry, noting participants drafted standards on chemical safety and security included in a set of non-binding guidelines.

The OPCW, the implementing body of the Chemical Weapons Convention, oversees the overarching global goal of permanently eliminating chemical weapons. Since the Convention's creation in 1997, it is the most successful disarmament treaty eliminating an entire class of weapons of mass destruction.

https://homelandprepnews.com/stories/40965-chemical-industry-safety-security-guidelines-addressed-during-workshop/

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US ARMS CONTROL

The Hill (Washington, D.C.)

Trump: North Korea's Kim Has 'Everything' to Lose 'If He Acts in a Hostile Way'

By Kyle Balluck and Justin Wise

Dec. 8, 2019

President Trump said Sunday that North Korean leader Kim Jong Un has "everything" to lose after Pyongyang reported a "very important test" at a rocket site.

"Kim Jong Un is too smart and has far too much to lose, everything actually, if he acts in a hostile way," Trump tweeted.

"He signed a strong Denuclearization Agreement with me in Singapore. He does not want to void his special relationship with the President of the United States or interfere with the U.S. Presidential Election in November," he added.

"North Korea, under the leadership of Kim Jong Un, has tremendous economic potential, but it must denuclearize as promised. NATO, China, Russia, Japan, and the entire world is unified on this issue!" he wrote.

....with the U.S. Presidential Election in November. North Korea, under the leadership of Kim Jong Un, has tremendous economic potential, but it must denuclearize as promised. NATO, China, Russia, Japan, and the entire world is unified on this issue!

— Donald J. Trump (@realDonaldTrump) December 8, 2019

A North Korean spokesman said in a statement carried by the official Korean Central News Agency earlier Sunday that Pyongyang had carried out a successful test on Saturday, adding that it was of "great significance" to Pyongyang.

"The results of the recent important test will have an important effect on changing the strategic position of the [Democratic People's Republic of Korea] once again in the near future," the spokesman added.

Experts said the test appeared to be a static test of a rocket engine rather than a missile launch.

North Korea's ambassador to the United Nations said just a day earlier that denuclearization talks between North Korea and the U.S. were off the table.

"We do not need to have lengthy talks with the US now and the denuclearization is already gone out of the negotiation table," the ambassador, Kim Song, said in a statement, according to CNN.

Kim also claimed that the "sustained" dialogue pursued by the U.S. was just part of an effort to benefit a "domestic political agenda."

The comments came as an end-of-year deadline for the countries to reach a denuclearization deal inches closer. Ri Thae Song, a North Korean vice foreign minister handling U.S. affairs, said in a statement last week that Trump was running out of time to salvage the negotiations.

"What is left to be done now is the U.S. option and it is entirely up to the U.S. what Christmas gift it will select to get," Ri said in comments relayed by North Korean state media.

"I have a very good relationship with Kim Jong Un," Trump told reporters on Saturday, Reuters reported. "I think we both want to keep it that way. He knows I have an election coming up. I don't think he wants to interfere with that."

"He's somebody I've gotten along with very well for three years," he added.

Kim Jong Un has issued a warning about taking a "new path" next year, Reuters reported, engendering fears that it could mean the country again starts testing nuclear bombs and long-range missiles.

Updated at 10:50 a.m.

https://thehill.com/policy/international/473562-trump-north-koreas-kim-has-everything-to-lose-if-he-acts-in-a-hostile

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VOA (Washington, D.C.)

Amid Trump Impeachment Fury, US and Russia Expected to Talk Arms Control

By Charles Maynes

Dec. 9, 2019

MOSCOW - Russian Foreign Minister Sergei Lavrov heads to Washington for hastily scheduled meetings with U.S. Secretary of State Mike Pompeo and, possibly, President Donald Trump, on Tuesday.

While a Russian Foreign Ministry statement said the mission's purpose would be to discuss "important issues" in U.S.-Russian relations, White House officials are signaling arms control will top the agenda, along with discussions aimed at bridging differences between Washington and Moscow over Syria and Ukraine.

The idea for the talks appears to have been jumpstarted by Russian President Vladimir Putin last week, when the Russian leader said Moscow was eager to extend the New START nuclear arms control treaty by the end of this year "without any preconditions."

"Russia is not interested in starting an arms race and deploying missiles where they are not present now," said Putin in an addressing the nuclear treaty — which expires in 2021 — during a meeting with officials in Moscow.

Washington seems to have gotten the message.

At the recent NATO summit in London, President Donald Trump noted his awareness of Moscow's desire to "do a deal" on arms control without providing details. Mr. Trump also suggested that U.S. and Russia negotiations eventually include China, a rising nuclear power not party to Cold War nuclear agreements.

"We'll also certainly bring in ... China. We may bring them in later, or we may bring them in now," said the President.

Indeed, White House officials said Lavrov's visit could include a meeting with the President — to reciprocate a courtesy extended by President Putin to Secretary Pompeo during his last visit to Moscow, says White House National Security Adviser Robert O'Brien.

"When [Secretary Mike] Pompeo has gone to Russia, [Vladimir] Putin's seen him. And one of the things that we've said with the- with the Chinese and the Russians is- and others, is we want reciprocity," said O'Brien in comments to CBS News' "Face the Nation" television program.

"And so Putin's met with ... Pompeo. I think as a matter of reciprocity, that's something we're looking at. But we're also looking at some other things. And we'll see if we can get there," O'Brien added.

For now, the State Department is confirming a "working lunch" between the two top diplomats, as well as press conference to follow.

Eye of impeachment storm

Mr. Lavrov goes to a Washington rifled by bitter partisan infighting over the ongoing impeachment inquiry against President Trump — set to pick up again this week as Democrats draft proposed articles of impeachment.

Impeachment hearings have thus far focused on Ukraine, where President Trump is accused of holding up hundreds of millions of dollars in congressionally approved aid to Kyiv in order to pressure Ukrainian President Volodymyr Zelenskiy into launching an investigation into Trump's potential Democratic rival in the 2020 U.S. presidential elections.

Yet Democratic lawmakers and former White House staffers argue Republicans' defense of the President parrots conspiracy theories pushed by Russian intelligence services: that Ukraine, not Russia, was behind a foreign interference campaign in the 2016 presidential elections.

Meanwhile, some congressional Democrats have also argued that the scope of the impeachment trial should include allegations of obstruction of justice by President Trump as detailed in a two-year Special Counsel investigation into Russian interference by special prosecutor Robert Mueller.

The result of that investigation — the so-called Mueller Report — was released earlier this year and did not find evidence of a conspiracy between the Trump campaign and Russia to influence the elections.

Yet the report also left it to Congress to determine whether President Trump had obstructed justice during the course of an investigation that saw several members of his campaign staff sentenced to jail.

The report also agreed with U.S. security agencies that Russia unequivocally sought to influence the outcome of the 2016 race — charges both the Kremlin and President Trump deny.

Further muddying the picture is the release of a highly anticipated report by the inspector general, Michael E. Horowitz, reexamining aspects of Mueller's Russia investigation. The report is expected to address the thus far unsubstantiated claims by Trump that the FBI illegally targeted his campaign in the Russia probe.

https://www.voanews.com/europe/amid-trump-impeachment-fury-us-and-russia-expected-talk-arms-control

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VOA (Washington, D.C.)

Russia Upsets Effort to Save 2015 Iran Nuclear Deal

By Michael Lipin

Dec. 6, 2019

Five world powers trying to save their 2015 nuclear deal with Iran from U.S. efforts to overturn it are grappling with a new setback as they meet with Iranian officials in Vienna Friday.

A day before Britain, France, Germany, China and Russia were to hold talks with Iran in the Austrian capital, Moscow said it was suspending its work to reconfigure Iran's underground Fordow nuclear facility for civilian medical research. The Trump administration had warned last month that it would revoke a waiver shielding Moscow from U.S. sanctions against the Fordow project starting Dec. 15.

TVEL, a unit of Russian state-owned nuclear energy company Rosatom, had been working on the Fordow project since 2017. The project had been one of several that Iran agreed to undertake with international companies to modify various Iranian nuclear sites in ways that would ensure their peaceful, civilian uses, rather than military ones.

Those projects were part of the 2015 deal in which Iran accepted restrictions on its nuclear activities in return for six world powers giving it relief from international sanctions.

The U.S. withdrew from that agreement last year, saying it did not do enough to prevent Iran from developing nuclear weapons or engaging in other perceived malign activities. Tehran has said its nuclear ambitions are solely peaceful.

TVEL announced the suspension of its Fordow work in a Thursday statement on its website. The goal of the project had been to convert about one-third of the facility's 1,044 early generation IR-1 centrifuges from being programmed to make enriched uranium — a key nuclear weapons ingredient — into being capable of making stable isotopes for medical purposes.

The Rosatom subsidiary attributed its suspension of the project to Iran's Nov. 6 move to resume the use of other IR-1 centrifuges at Fordow to produce low-enriched uranium. TVEL said it was "technically impossible" to produce medical isotopes with some centrifuges while other centrifuges in the same room were enriching uranium and spreading traces of it everywhere.

"To resume this work, we must stop and dismantle the cascades where uranium enrichment takes place and thoroughly clean the premises and equipment," TVEL said.

Iranian officials described the resumption of enrichment at Fordow as their fourth in a series of gradual violations of the nuclear deal, a strategy aimed at pressuring the deal's European and other remaining signatories to do more to compensate Tehran for the impact of U.S. sanctions that President Donald Trump has been re-imposing and intensifying since last year.

Trump has said the escalating sanctions are part of a U.S. campaign of "maximum pressure" on Iran to agree to a new deal curbing its nuclear and other activities opposed by Washington.

As part of the campaign, Secretary of State Mike Pompeo told a Nov. 18 press briefing that Washington will revoke its sanctions waiver for international work at Fordow Dec. 15. That announcement put Russia's Rosatom at risk of being hit with U.S. sanctions if it continued the work after that date.

Pompeo said the U.S. decision was in response to Iran resuming enrichment at the once-secret Fordow site earlier in November. He said there was "no legitimate reason" for Iran to take the step and called for it to be reversed immediately.

Russian Deputy Foreign Minister Sergei Ryabkov, who is representing Moscow at the Vienna meeting of the Joint Commission of nuclear deal parties, cited the prospect of U.S. sanctions on Rosatom as another reason for TVEL's suspension of the Fordow project.

Speaking to Russian media Thursday, Ryabkov said Moscow needed to "analyze … the potential negative consequences of the American measures," a reference to the impending termination of the sanctions waiver.

A report by Russian newspaper Kommersant quoted Russian atomic energy expert Alexander Uvarov as saying Rosatom has many international projects and did not want to risk hurting them by exposing itself to U.S. sanctions.

Ryabkov said he would use the Vienna talks to raise the issue of the U.S. preparing to sanction international work at Fordow, a move he criticized as an attempt to break up the nuclear deal.

Some analysts predicted Iran and the five world powers in Vienna likely would agree that the U.S. is to blame for the suspension of the Fordow project and avoid blaming each other for the setback to the deal or using its dispute resolution mechanism to resolve the issue.

"The Europeans realize that triggering the dispute resolution process could end in a re-imposition of U.N. Security Council sanctions and that would kill the JCPOA," analyst Kelsey Davenport of the Arms Control Association told VOA Persian, using an acronym for the nuclear deal, formally known as the Joint Comprehensive Plan of Action. "So I think they will be judicious in their decision-making process before going down that road."

But Davenport said Britain, France and Germany could act if Iran follows through on a threat to more seriously breach its nuclear deal commitments in January and moves closer to having the capability to make an atomic bomb.

"The Europeans may no longer see security value in remaining in the deal and trigger that dispute resolution mechanism," she said. "So the window to try to preserve the JCPOA and bring Iran back into compliance is unfortunately closing."

"At the moment, I don't think that is what the Iranians want," said Behnam Ben Taleblu, an analyst at the Foundation for Defense of Democracies, also speaking to VOA Persian.

"The Iranians have an incremental strategy (for violating the nuclear deal) for a reason, which is to keep the JCPOA on life support, in case there is a change in Washington in 2020," Taleblu said. "At that point, they could tempt a new U.S. president to come back into the deal and perhaps provide Tehran with some kind of payment for the damages incurred during sanctions."

Iran did not immediately comment on what it plans to do with its nuclear program following the Russian exit from Fordow.

This article originated in VOA's Persian Service.

https://www.voanews.com/middle-east/voa-news-iran/russia-upsets-effort-save-2015-iran-nuclear-deal

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COMMENTARY

The Hill (Washington, D.C.)

Trump Runs Dangerous and Chaotic Approach toward Nuclear Weapons

By Laura Kennedy

Dec. 3, 2019

The decision to abruptly withdraw United States forces from Syria is one of the most recent dangerous illustrations of the flawed foreign policy of President Trump and the chaos it has generated abroad. As a diplomat who served for nearly 40 years and under seven presidents, I am aware of how these impulsive and undisciplined actions have left allies reeling with American interests hobbled. His approach toward nuclear weapons and arms control is similar, but with even graver possible consequences.

His nuclear agenda reflects the same pattern of alliance mismanagement, American unreliability, and chaotic decision making. Instead of bailing on bilateral and multilateral arms control efforts, the United States should preserve remaining treaties like the New Strategic Arms Reduction Treaty and the observation regime offered by the Open Skies Treaty, which promote our interests abroad and avoid introducing destabilizing and unnecessary nuclear weapons in a heated international competition.

The Iran nuclear deal was the first nonproliferation agreement to be axed by Trump, followed by the Intermediate Range Nuclear Forces Treaty. By recklessly withdrawing from the successful limits imposed on the Iranian nuclear program, Trump undercut our reliability with some of our closest allies and raised global tensions. Withdrawing from the latter agreement rather than continuing efforts to resolve violations by Moscow has shifted the onus away from Russia while removing constraints. The insecurity from withdrawal of these agreements is exacerbated by the prospect of blowing up the other key foundations of our arms control architecture.

Next may be the Open Skies Treaty. It is a useful transparency regime which was instituted by the United States and 33 other nations. The agreement allows these nations to conduct observation flyovers of the territories of each of the signatories, providing critical insight into military deployments and possible military buildups. While some might argue that new technology makes such flyovers unnecessary, that overlooks the advantage offered by the framework. It is difficult to ignore evidence when all states have access to the same intelligence. Leaving this deal would end those benefits, poorly serve Ukraine, and send yet another message to our allies and adversaries of our diplomatic unsteadiness.

Such a counterproductive step would be massively compounded if the United States does not extend the New Strategic Arms Reduction Treaty, which caps American and Russian deployed strategic nuclear weapons and is set to expire in early 2021. The predictability, transparency, and access it provides is unparalleled. Its regime of notifications, information exchange, and onsite inspections has been lauded on both sides of the aisle and by numerous military and civilian officials. In addition to losing this level of certainty on Russian strategic nuclear weapons, the United States could face an expensive and destabilizing arms race, beyond the major $1 trillion nuclear program already authorized by President Obama.

In fact, the Trump administration has called for the development of a new "low yield" submarine launched ballistic missile deemed more "usable" for the military. Critics argue it would be difficult to distinguish from existing high yield variants and would increase the risk of nuclear

miscalculation. The House has included a provision in the annual defense authorization bill earlier this year that prohibits the deployment of such a submarine weapon. As the conference negotiations continue, the Senate ought to recognize the risks of this unnecessary and destabilizing addition to our already massive nuclear arsenal and ensure it remains in the final bill.

Russia and China indeed pose risks, and we must seek to have serious strategic dialogues with both. But as we pursue such talks, we should use them to build on existing agreements, most notably the New Strategic Arms Reduction Treaty, and not scrap historical agreements in favor of a complex new effort to include additional weapons and actors such as China. Such a comprehensive deal, which the Trump administration says it is pursuing, would take years to negotiate. Russia does not believe there is time to negotiate a new arms control agreement prior to the expiration of the New Strategic Arms Reduction Treaty, and China has emphatically rejected joining such a trilateral endeavor. Any potential negotiations are further complicated by the fact that the State Department has dumped its under secretary and assistant secretary in charge of arms control policy.

When it comes to international agreements, ignoring legislative, military, and civilian expert advice and picking fights with American allies leads to chaos, frayed alliances, and increased instability, as we have witnessed in Syria, Ukraine, Turkey, and across the world. The United States simply cannot afford to let that happen when it comes to nuclear weapons.

Laura Kennedy is a member of the board of directors of Foreign Policy for America. She served as United States permanent representative to the Conference on Disarmament in Geneva, was a diplomat for the United States Mission to International Organizations, and served as the deputy assistant secretary for European Affairs with the Department of State.

https://thehill.com/opinion/international/472841-trump-runs-dangerous-and-chaotic-approach-toward-nuclear-weapons

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Defense One (Washington, D.C.)

Today, Everyone's a Nuclear Spy

By Amy Zegart

Dec. 6, 2019

Tracking nuclear threats used to be the sole province of secret agents and analysts at high-powered government intelligence agencies. Not anymore.

Today, the world of new nuclear sleuths is straight out of the Star Wars bar scene.

Peering into the hidden nuclear activities of North Korea, Iran, and other suspected proliferators are journalists, hobbyists, professors, students, political-opposition groups, advocacy groups, nonprofit organizations, for-profit companies, think tanks, and former senior government officials with informal links to international weapons inspectors, American policy makers, and intelligence leaders.

Among this wildly eclectic mix of individuals and organizations, some are amateurs. Others have extensive expertise. Some are driven by profit, or political causes. Others are driven by a mission to protect the United States and reduce global nuclear risks. Nearly all harbor an obsessive interest in nuclear secrets and finding creative ways to unlock them. Together, these self-appointed watchdogs are transforming American nonproliferation efforts—and largely for the better. Yet they also create new challenges for the U.S. government, which once enjoyed a near-monopoly on detailed

surveillance imagery of hostile countries with nuclear ambitions. American intelligence agencies must now operate in a world where highly revealing information is sitting out in the open, for anyone to see and use.

David Schmerler, part of a team at the James Martin Center for Nonproliferation Studies, goes by the nickname "Geolocation Jesus" because of his skills at pinpointing North Korean locations using far-ranging clues, such as Kim Jong Un's public schedule, the number of skylights in a photographed room, Google Earth, and his knowledge gleaned from watching every North Korean missile propaganda video ever released. Frank Pabian, who works closely on a Stanford University team led by former Los Alamos Laboratory Director Siegfried Hecker, is one of the world's leading imagery analysts and a former American weapons inspector. Then there's Jacob Bogle, a coin dealer by day and North Korean mapping hobbyist by night who has created one of the world's most detailed maps of North Korea from his home in Murfreesboro, Tennessee. In my own research, I've found 17 major groups or players actively tracking illicit nuclear activities around the world.

Not all of the work generated by this wide-ranging ecosystem is accurate, but much of it is pathbreaking. And all of it is unclassified.

For decades, the governments of great powers—and especially the United States—had cornered the satellite market, for good reason: Operating anything in space was technically demanding and inordinately expensive. The CORONA satellite, a project of the CIA and the U.S. Air Force, was the first to photograph large swaths of the planet in 1960, returning its film in a capsule that had to be parachuted down to Earth and captured in midair over the Pacific Ocean to be developed. The engineering challenge was so punishing that CORONA's first 13 missions failed. But on the 14th attempt, it hit pay dirt, photographing more Soviet territory than all previous U-2 spy-plane flights combined. According to Albert Wheelon, the CIA's first deputy director of science and technology, "It was as if an enormous floodlight had been turned on in a darkened warehouse." The Soviets soon launched their own photoreconaissance satellite, Zenit-2, in 1962. It, too, was expensive and failed repeatedly before it finally returned usable imagery.

Since the early 2000s, however, commercial satellites have become common. According to the 2019 threat assessment issued by the Office of the Director of National Intelligence, the annual number of satellite launches has quadrupled in the past five years. In a single launch last year, the private firm SpaceX sent 64 small satellites from 17 countries, and a Florida middle school, into space. News reports note that in 2018 alone, 322 small satellites the size of a shoebox were hurled into orbit, and some analysts estimate that more than 8,000 small satellites will be launched in the next decade.

Spy satellites still offer better resolutions and capabilities. But today's commercial satellites are narrowing the gap, offering image resolutions that are roughly 900 percent better than what they were just 15 years ago—sharp enough to distinguish different types of cars driving along a road and capture certain indicators of equipment used in nuclear-weapons programs. What's more, constellations of small satellites can fly over the same location multiple times a day, identifying changes on the ground in near–real time. Already, a San Francisco start-up called Planet has more than 150 satellites in orbit. Seattle-based BlackSky, which launched in 2013, has 60 satellites and says it flies over major cities 40 to 70 times a day. Perhaps most important, the costs of acquiring satellite imagery have plummeted—just as computing and communication power has been radically democratized.

Today, more than half the world's population uses the internet, and by next year, more people will have cellphones than running water. Connectivity is making everyone a potential intelligence officer. People can review photos posted on social media, record seismic activities on their

cellphones, and use 3-D modeling apps to assess whether a suspicious facility could actually accommodate the kind of equipment used in nuclear-weapons development.

In recent years, expert groups in this ecosystem—teams led by Hecker, also my colleague, at Stanford; Jeffrey Lewis of the Center for Nonproliferation Studies; and David Albright at the Institute for Science and International Security—have made a number of breakthroughs. They have pinpointed the location of North Korea's first two nuclear tests years before the North Koreans confirmed them. They have tracked the construction of a new nuclear reactor at Pyongyang's Yongbyon complex and estimated its operational capability. They have identified the function, size, and capacity of Iran's secret nuclear facility at Natanz. And they have quickly debunked false information, such as Kim Jong Un's claim that he had successfully tested a submarine-launched ballistic missile in 2016.

Nongovernmental nuclear sleuths have taken one another on, too. When an Iranian opposition group called the National Council of Resistance of Iran tried to derail the Iran nuclear deal in 2015 by announcing that a company called Maritan was secretly housing a nuclear facility in the basement of its Tehran office, Jeffrey Lewis's team showed within a week that the purported evidence was false. Maritan was a real company. It even had employees on LinkedIn. But it had nothing to do with nuclear enrichment. It specialized in making secure documents like national identification cards.

Analyzing satellite imagery, Lewis's team found no construction activity at the Maritan office site during the alleged nuclear-facility-construction time frame or obvious signatures of nuclear-enrichment activities found at other known Iranian sites—such as ventilation systems or electrical substations to power nuclear centrifuges. Using 3-D modeling, it showed that the alleged facility was in fact too small to fit the necessary nuclear machinery and infrastructure. And Lewis found that the group's photograph of a lead door—which supposedly proved there must be radioactive substances inside—was actually just copied from a commercial Iranian website. Lewis's team also found that none of the known Iranian sites ever used lead doors because radiation leakage had never been a concern. Perhaps most incredibly, it used crowdsourcing, social media, and a GPS location app to find someone who had actually been to Maritan. The team contacted this person by email and verified who he was—identifying his hobbies, marital status, and even getting his photograph in the process, all from open-source detective work. From him, it learned that Maritan regularly brought foreign contractors to the office, making it highly unlikely that the company would put a secret nuclear facility in its basement.

As these examples suggest, nongovernmental nuclear sleuths provide more hands on deck for intelligence agencies to validate or disprove nuclear developments. And because nongovernmental organizations and individuals operate in the unclassified world, their findings can be shared within governments and between them. That's a major shift. Their findings can be publicized across agencies and borders, galvanizing attention to an issue. In addition, open-source intelligence makes possible more input and analysis from a broader array of experts than information collected by traditional intelligence agencies. Particularly because nuclear threats are so dangerous, intelligence about them is almost always highly classified. While the siloing of this information has benefits, it also comes with serious drawbacks. Chief among them is the risk that the information will not be sufficiently subjected to independent or competing perspectives. The more classified something becomes, the fewer people get to see it. Going black runs the risk of going dark, leaving bits of intelligence underdeveloped and under-considered.

To be sure, open-source nuclear sleuths raise the risk that errors could go viral and that adversaries could be tipped off that they need to hide their nuclear activities better. Amateurism has its limits, especially when it comes to analyzing images from space. Even a seemingly unmistakable landmark

can be hard to pick out. From directly overhead, St. Louis's Gateway Arch does not appear archlike at all. Identifying telltale indicators of weapons proliferation is a very subtle art; imagery analysts need to understand the nuclear-fuel cycle so they know which visual clues to look for. To the untrained eye viewing objects from unfamiliar angles, a road can look like a railroad track, a dried-up stream bed can look like a tunnel, a massive elevator can look like a missile launch pad, a livestock pen can resemble an Indian nuclear test site, a cylindrical foundation for a hotel can look like the beginnings of a hidden nuclear facility. These aren't hypothetical mistakes. Amateur nuclear detectives have made these errors, which were publicized before they were corrected.

In 2011, a group of Georgetown students and their professor even sparked congressional hearings and a flurry of activity inside the Pentagon when their amateur analysis suggested that China was hiding thousands more nuclear weapons in underground tunnels than American intelligence officials had estimated. Their analysis turned out to be incorrect, but not before it captured national headlines and generated pressure for officials to waste time double-checking and justifying the accurate assessments they already had.

And that's what happens with well-meaning mistakes. Nefarious actors could inject deliberate deceptions, raising the risk that falsehoods will be believed, truth will be doubted, and intelligence agencies will be tied up serving as "verifiers of last resort" rather than advancing their own intelligence collection and analysis priorities.

Clever nuclear sleuthing could also tip off adversaries, alerting them to weaknesses in their camouflage, concealment, and deception techniques that they didn't know existed and causing them to take new measures that make monitoring by everyone more difficult. Some public evidence already suggests that the detail of images available on Google Earth has prompted new Chinese efforts to conceal military facilities from more frequent satellite-shooting intervals. And after Dave Schmerler was able to measure the size of North Korea's first nuclear device and locate the building where it was photographed by using objects in the room as clues, the next North Korean photo of a warhead was taken in an otherwise empty room. Whether Schmerler's research prompted the change remains a mystery. But history suggests that hiding and seeking go hand in hand: Whenever new monitoring capabilities are revealed to an adversary, countermeasures are likely to follow.

Yet despite these risks, the democratization of nuclear-threat intelligence is likely to be a boon to the cause of nonproliferation. Aspiring nuclear states have always gone to great lengths to conceal their atomic ambitions and activities. But dark programs can quickly spiral into global dangers—as Americans saw in October 1962, when the Soviets' determination to surprise the United States with a nuclear fait accompli in Cuba brought the world to the brink of total nuclear war. Thanks to the new nuclear sleuths, estimating nuclear dangers isn't just for governments anymore. For would-be proliferators like Iran and North Korea and future regimes that might consider following in their footsteps, hiding the evidence is going to get a whole lot harder.

Amy Zegart is the co-director of the Center for International Security and Cooperation and a senior fellow at the Hoover Institution and the Freeman Spogli Institute at Stanford University. She is the author of three books examining U.S. intelligence challenges, including Spying Blind: The CIA, ...

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

The Vatican's Nuclear Diplomacy from the Cold War to the Present

By Aaron Bateman

Dec. 6, 2019

In June 1982, Pope John Paul II broke with over three decades of Vatican policy when he emphatically stated in front of the United Nations General Assembly that nuclear deterrence could be judged as "a morally acceptable step on the way toward a progressive disarmament." This statement stood in marked contrast to his predecessors, who rejected peace based on the threat of mutual annihilation. Since the beginning of the nuclear age, the Vatican has placed nuclear issues at the top of its foreign policy agenda. Though the Cold War superpowers were very concerned with the Vatican's position on nuclear arms, it has, nevertheless, received little scholarly attention in historical analyses of the arms race. For example, when President Ronald Reagan decided to pursue his Strategic Defense Initiative — a controversial missile defense system — to "render nuclear weapons impotent and obsolete," he actively sought the pope's support. Meanwhile, the Soviet Union lobbied, unsuccessfully, to get John Paul II to publicly condemn the program. In the 1980s, the Pontifical Academy of Sciences in Vatican City became a forum for scientists from both sides of the Iron Curtain to exchange ideas on nuclear issues.

In the post-Cold War era, the Vatican remains very active in its effort to influence the international dialogue on nuclear weapons. Pope Francis has made nuclear arms control a primary objective of his foreign policy. He has changed course from John Paul II's position on deterrence and stated that not only the use, but also the possession of nuclear weapons is immoral. In addition to advocating comprehensive arms reduction agreements, Pope Francis is committed to raising awareness about the potentially destabilizing effects of artificial intelligence on the future of warfare, including nuclear stability. The pope no longer has a large military at his disposal, nor significant economic resources. The Vatican does, however, have diplomatic relations with 183 countries in addition to its international moral authority. From the Cold War to the present time the Vatican has been a significant but understudied player in international deliberations on nuclear weapons and disarmament.

The Vatican Enters the Nuclear Age

Throughout the Cold War, the Pontifical Academy of Sciences served as the main forum for the Vatican's scientific and moral debates regarding nuclear weapons. It has served to inform the nuclear diplomacy of the Vatican from the dawn of the nuclear age until the present time. Pius XI founded the modern academy in 1936, but it can trace its lineage back to the 16th century and even had Galileo as one of its members. Pius XI wanted to establish a forum for dialogue between faith and science in the modern age, and appointed over eighty academicians from many different countries. Notably, since its founding, members of the academy do not have to be Catholic or have any religious affiliation. The academy has had more than forty Nobel laureates — Max Planck, Werner Heisenberg, and Niels Bohr were just three of the many prominent 20th century scientists who were elected members of the Pontifical Academy of Sciences. Pius XI believed that the search for truth was the primary objective of the academy. This goal would have significant political repercussions when the academy began examining the morality of nuclear weapons in the coming decades.

In March 1939, Cardinal Eugenio Pacelli was elected by his peers to become the Supreme Pontiff of the Roman Catholic Church. He chose Pius XII as his regnal name. Like his predecessor and mentor Pius XI, he was a seasoned papal diplomat and intimately understood the political landscape of Europe. He was profoundly anti-communist and believed that cooperation with and

accommodation of the Soviet regime was not only inadvisable, but indeed also impossible. He remained in Rome during World War II and witnessed first-hand the devastation wrought by allied strategic bombing. What he is perhaps least recognized for is his intense interest in the scientific and technological changes taking place in the 1930s and 1940s.

Pius XII was especially concerned with developments in atomic research during this period. He had extensive contact with German physicist Max Planck about the potential consequences of nuclear power for warfare. In 1941, the pope told a gathering of the Pontifical Academy of Sciences that in the hands of man, science can become a double-edged weapon capable both of curing and killing. At the urging of Planck, in 1943 the pope said that scientists were informing him that nuclear technology could create "an amount of energy that could take the place of all the largest electrical power plants in the world." He warned, however, that such technology should only be used for peaceful purposes "because otherwise the consequences would be catastrophic… for the whole planet." The pope became distraught when he learned that the United States used atomic bombs on Hiroshima and Nagasaki. He described nuclear weapons as "the most terrible weapon that the human mind has ever conceived."

Pius XII did, however, maintain that the use of force could be justified in a modern context. In 1953 he said, "It is certain that even in the present-day circumstances war cannot be considered illicit for a nation to efficiently defend itself and to achieve victory when it is attacked unjustly and all efforts to avoid it have proved futile." He did declare, nevertheless, that nuclear weapons could not be employed within the boundaries outlined by St. Augustine's writings on just war theory — this body of work guided the Vatican's position on war.

In the 5th century, St. Augustine claimed that defense could be a necessity when justified by a legitimate authority and that "the wise man will wage just wars." Nine hundred years after St. Augustine, St. Thomas Aquinas expanded on the former's writings about conflict and stated that war must occur for a good and just purpose, that war must be waged by a properly instituted authority (e.g. a state), and that peace must be the central motive. Pius XII specifically identified Aquinas's condition of "peace as a central motive" as a primary problem with the use of nuclear weapons. He stated that "when the harm wrought by war is not comparable to that caused by tolerating injustice, we may be obliged to suffer injustice." For the pope, because nuclear weapons would likely kill so many non-combatants, they could never be employed within the just war theory framework outlined by Augustine and Aquinas.

Pius XII used scientific arguments against the testing and deployment of nuclear weapons. More specifically, he focused on the potential effects of nuclear fallout as a compelling reason why nuclear weapons should never be used. He used his Christmas message in 1955 to articulate the harmful effects of nuclear testing and the use of atomic weapons, saying, "a nuclear explosion releases an enormous amount of energy… in an extremely short period; it consists of radiations of an electromagnetic nature of very high density… launched at speeds close to that of light… wreaking havoc." Thus, he emphasized the use of science — in addition to moral imperative — as a rhetorical weapon in his passionate arguments against the possession and use of atomic weapons.

In October 1958, Pius XII died and was succeeded by John XXIII, who was also a seasoned papal diplomat. Like his predecessor, he was very concerned with the threat of nuclear war. A little over one year after the Cuban Missile Crisis, on April 11, 1963 he issued his encyclical Pacem in Terris ("Peace on Earth"). In it, he acknowledged that nuclear weapons could "indeed act as a deterrent" but he also stated that "the very testing of nuclear devices for war purposes can… lead to serious danger…" He also rejected the idea of peace based upon mutually assured destruction, observing that, "lasting peace among nations cannot consist in the possession of an equal supply of

armaments, but only in mutual trust." In addition, he expressed grave concerns about the economic costs of the nuclear arms race.

John XXIII emphatically rejected the idea that nuclear weapons could be justified on moral grounds when he said "in this age which boasts of its atomic power, it no longer makes sense to maintain that war is a fit instrument with which to repair the violation of justice." He did, however, break with Pius XII's vocal anti-communism. He wanted to lower the overall tension between east and west. So, while he maintained that nuclear weapons were not acceptable, he did reduce the Vatican's direct moral and political pressure placed on the communist world in particular.

In 1963, John XXIII died and was succeeded by Paul VI, who carried on his predecessor's legacy on nuclear weapons. He stated that peace created by nuclear deterrence was "a tragic illusion." Most significantly, he instituted the Vatican's policy of Ostpolitik ("Eastern Politics") aimed at rapprochement with the Soviet Union. He believed that the USSR could last indefinitely and that it was better to seek a peaceful accommodation than to maintain a policy of hostility and isolation. This policy represented a complete departure from Pius XII's vocal anti-communism. In 1978, Paul VI passed away and was replaced by John Paul I. His papacy lasted for only 33 days, and thus he did not make any significant foreign policy changes. His successor would, however, lead the Vatican in a completely new direction and change the course of the Cold War in the process.

A New Pope Accepts Deterrence

When Cardinal Karol Wojtyla became Pope John Paul II in 1978, he was the first non-Italian pope in over 400 years. The election of a Polish pope during this tense period in the Cold War immediately drew the attention of the Soviets. The KGB and its Polish sister service had been closely following the career of the man who would be John Paul II for many years. After he became pope, the Kremlin was intensely concerned with his diplomatic agenda. According to Vatican scholar George Weigel, John Paul II rejected Ostpolitik and he pursued "a strategy of resistance through moral revolution." In 1981, he visited Hiroshima and Nagasaki and spoke about how the arms race was getting out of control and placing the future of humanity in jeopardy. In June 1982, he stated in front of the United Nations General Assembly that nuclear deterrence could indeed be judged as a moral intermediate step toward disarmament. He continued, nevertheless, to encourage world leaders to push for arms reduction.

When Reagan became president in 1981, he very much saw John Paul II's position on communism and nuclear weapons as in line with his own. He abhorred nuclear weapons and wanted to find a way out of the arms race. During his presidency, questions about the morality of nuclear strategy became a central point of concern. Adm. James Watkins, Reagan's Chief of Naval Operations, was a devout Catholic and stated openly in 1983 that mutually assured destruction was not a morally sound long-term strategy. In 1983, the Reagan administration was deeply disturbed by the United States Conference of Catholic Bishops' report on nuclear weapons that also questioned the morality of mutually assured destruction. In light of the significant doubts about the morality of American national strategy, Reagan sought the pope's support for his plan to change the nature of the American-Soviet arms competition.

In March 1983, Reagan announced his intention to create a capability that would render nuclear weapons obsolete and move the world out from under the threat of mutually assured destruction, a vision that ultimately became the Strategic Defense Initiative. Reagan sought out the Vatican's support for this program. A declassified Central Intelligence Agency memorandum details a January 1986 trip of a Strategic Defense Initiative briefing team to the Vatican. Members of this group provided senior Vatican officials and scientists from the Vatican observatory a briefing on the program. Multiple high-ranking clerics informed the U.S. ambassador to the Vatican that "it would

be impossible for them to support a military program, which potentially takes food from the mouths of the poor."

While Pope John Paul II did not overtly support missile defense, he refused to criticize it either. Many Pontifical Academy of Sciences members believed that the program could have negative repercussions for the arms race. The pope was very concerned about the implications of emerging technologies for superpower relations. In the early and mid-1980s, the academy hosted conferences on nuclear security issues that drew distinguished scientists such as American physicist and national security expert Richard Garwin and Soviet physicist Evgeny Velikhov. In 1985, the academy began compiling a report on the implications of the Strategic Defense Initiative for strategic stability. When the Reagan administration discovered this, it began lobbying the Vatican not to publish the report. At the same time, the Soviet foreign minister flew to Vatican City and tried to convince the pope to publicly criticize the program. John Paul II, however, in no way wanted to appear to be supporting a Soviet cause. In the end, the pope ensured that the report was never published. While both superpowers were in a race over strategic technology, they were also competing for the support of the Supreme Pontiff of the Roman Catholic Church.

Vatican Nuclear Diplomacy after the Cold War

On April 19, 2005 German Cardinal Joseph Ratzinger succeeded John Paul II and became Pope Benedict XVI. He was the first post-Cold War pontiff. Even though the Cold War was officially over, he remained intimately concerned with nuclear proliferation and its effects on the developing world in particular. Benedict XVI was especially worried about "how expenditure on armaments served to perpetuate domestic and local inequalities" and he emphasized the "urgent need to both revitalize non-proliferation efforts and move to decommission existing nuclear weapons." In his first World Day of Peace Message in 2006 he declared that, "in a nuclear war there would be no victors, only victims." He thus built upon the arguments of his predecessors and also emphasized the socio-economic consequences of a strategy based on nuclear deterrence. His successor would, however, go even further in his advocacy for abolishing nuclear arms.

In February 2013, Benedict XVI became the first pope since the 15th century to resign the papal office. He was succeeded by Argentine Cardinal Jorge Mario Bergoglio, who took Francis as his regnal name. Since the beginning of his papacy, Francis has made the elimination of nuclear weapons a top priority of his foreign policy. In 2015, he said in front of the United Nations General Assembly that "we must therefore commit ourselves to a world without nuclear weapons." He condemned even the possession of nuclear weapons as immoral with his statement that "the threat of their use as well as their very possession is to be firmly condemned." He broke, therefore, completely with John Paul II's position that nuclear deterrence could be considered a moral intermediate step towards disarmament. Pope Francis has also put his words into action. In July 2017, the Vatican voted in favor of a treaty that prohibits the "development, testing, production, manufacture, otherwise acquisition, possession or stockpiling [of] nuclear weapons or other nuclear explosive devices."

The current pope is also very concerned about the potentially negative implications of emerging technologies that could affect nuclear command and control. He has placed a spotlight on artificial intelligence and is worried about its likely influence on the future of warfare. In May 2019, the Pontifical Academy of Sciences hosted a conference on artificial intelligence that specifically considered its possible consequences for military operations. The implications of artificial intelligence for nuclear stability looms very large in the minds of many academy scientists who directly advise the pontiff on scientific and technological matters.

While the Vatican has placed great emphasis on working towards a world without nuclear weapons, has it had an impact? During the Cold War, Reagan certainly believed that the pope's moral

authority added significant momentum to the arms control negotiations taking place in the 1980s. In 2015, Rose Gottemoeller, President Obama's senior arms control official in the State Department, stated, "I think there is a huge moral impact of the Vatican on issues that relate to nuclear weapons deterrence and the disarmament agenda overall" and that "you can't just wave a magic wand and make nuclear weapons go away. It takes hard work and it takes a lot of very practical steps, but we can get there." Obama was receptive to the pope's message on nuclear weapons and sought to work with him towards the elimination of nuclear weapons, though no significant strides were made as a result of Washington's and the Vatican's shared vision.

Events of the past 75 years strongly suggest that the Vatican is unlikely to make any significant headway with its nuclear diplomacy without support from the United States. The present pope's declaration that even the possession of nuclear weapons is immoral will likely alienate the nuclear powers and actually impede the Vatican's objectives in the realm of nuclear diplomacy. John Paul II, by contrast, had a realist perspective on the international system, which enabled him to formulate policies that gave the Vatican a greater voice in international affairs. The alignment of Vatican and American policy on arms control began to unravel, however, in the post-Cold War era.

The Limits of Moral Authority

In the 1940s the Vatican recognized that nuclear weapons would fundamentally change the nature of the international system. Since that time, each pope has consistently lobbied against their use. The Cold War environment created a willingness among popes, John Paul II in particular, to accept nuclear deterrence. In the post-Cold War period, the Vatican has passionately condemned nuclear deterrence and made the abolition of nuclear weapons a primary foreign policy objective. World leaders recognize that the pope is the head of an institution with over one billion members. He has diplomatic relations with over 180 countries, including Russia and Iran, and has been recognized by both Moscow and Tehran as having significant influence in international relations. The United States and the Soviet Union both lobbying the Vatican to support their respective positions on the Strategic Defense Initiative strongly suggests that the moral authority of the pope is not an insignificant consideration in international affairs.

The nuclear age does, however, demonstrate that the moral authority of the papacy has significant limits. The Vatican recognizes that it cannot achieve its objective of nuclear disarmament without the agreement of all the nuclear powers, which is an outcome that is unlikely in the near future. For the past seven decades, the Vatican has persistently engaged with world leaders on shaping norms surrounding the possession and use of nuclear arms. Its policy of political non-alignment and its intellectual arguments based in the just war tradition have solidified its place among the prominent voices shaping the dialogue on nuclear issues. The reality is that hard power still supersedes the moral influence of the oldest institution in the world and moral arguments have not solved the security dilemma facing the nuclear powers.

Nevertheless, the Vatican has grown accustomed to confronting substantial political challenges over the last two millennia, so the pope is willing to wait patiently.

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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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