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Feature Report

“Machine Learning Applications in Nonproliferation: Assessing Algorithmic Tools for Strengthening Strategic Trade Controls”. Published by Middlebury Institute; August 2020

https://www.nonproliferation.org/wp-content/uploads/2020/08/CNS_Nonpro_Notes_082020.pdf

The goal of this report is to demonstrate how machine learning image classification tools may supplement traditional strategic trade controls to bolster nonproliferation efforts.

The author of this report was able to create a successful proof of concept, demonstrating machine learning models’ ability to classify controlled dual-use goods from images publicly available online. The research team’s goal was to assess the potential utility of machine learning algorithms to classify relevant images as a supplementary tool for detecting potential violations of strategic trade controls. The algorithms discussed in this report are image classification models, or machine learning algorithms that autonomously classify images.

The report details relevant items of interest and selection methodology, a dataset of relevant WMD-related dual-use equipment, and successful image classification model development and evaluation. It also considers the potential wider applicability of machine-assisted identification for nonproliferation efforts including field applications, such as an image dictionary of controlled goods, automating new image classification, and extracting images from additional online sources such as videos.

Because of the criteria that decide which dual-use goods are subject to export controls, it is unlikely that full automation by means of machine learning image classification is currently possible. While image classification models can recognize objects, this research suggests that, often, the models cannot recognize context or item characteristics such as material and size. Thus, while machine learning image classification tools can improve the efficacy of strategic trade control implementation and respective nonproliferation efforts, the research presented here could imply that these tools and applications might not solve all the problems associated with controlling dual-use goods.

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NUCLEAR WEAPONS AND DETERRENCE

Department of Defense (Washington, D.C.)

Nuke Sea-Launched Cruise Missile Would Bolster Deterrence, Officials Say

By Jim Garamone

Aug. 4, 2020

Developing and deploying a sea-launched nuclear cruise missile is essential to deter Russia, U.S. officials have said.

A recent State Department paper says the new weapon would help fill a gap identified in the 2018 Nuclear Posture Review.

The United States retired its last nuclear sea-launched cruise missile in 2010 — one of only two remaining U.S. theater or tactical ("non-strategic") nuclear weapons. In contrast, Russia continued a comprehensive program to modernize and expand its low-yield theater and tactical nuclear weapons. What is more disturbing, officials said, is that Russian strategy actually contemplates the use of these nuclear capabilities in conflict.

Russian strategic thought mistakenly believes that limited nuclear first use with low-yield weapons could provide Russia with a "coercive advantage" in a conflict, the State Department paper says.

Russia may have pursued this strategy because the United States, unlike Russia, retired most of its non-strategic nuclear systems. Russia may believe it can use theater or tactical weapons, the paper says, because the United States could not effectively respond and might be reluctant to escalate further by responding with strategic nuclear weapons.

The 2018 Nuclear Posture Review calls for adjustments to U.S. nuclear forces to close this perceived gap on the escalation ladder and reinforce deterrence against low-yield nuclear use, DOD officials said.

A nuclear-armed sea-launched cruise missile would address alarming developments in the forces and doctrine of nuclear competitors, the posture review says, adding that Russia and China both are investing significant sums to improve and expand their nuclear forces with no clear indication as to where that expansion will stop.

Russia's "adventurism" is the most immediate concern, officials said. The nation invaded Georgia in 2008 and still occupies two provinces. Russia illegally occupied Crimea in 2014 and sponsors a shooting war in the eastern part of Ukraine today. Russia has propped up the Assad regime in Syria and has prolonged the civil war in that nation. Russia has also sent forces to Libya, and Kremlin-associated contractors have seized two of its largest oil facilities. Finally, Russia has done its best to divide the North Atlantic Treaty Organization, seeking more leeway to intimidate the frontline states of Latvia, Estonia, Lithuania, Poland, Bulgaria and Romania.

There are credible concerns that theater and tactical nuclear capabilities are central to a Russian approach to regional conflict that envisions the early, limited use of non-strategic nuclear weapons to end a war on terms favorable to Russia.

"This approach may be premised on Russia's belief that its expanding anti-access/area denial networks will be able to neutralize the airborne nuclear deterrent forces of the United States and NATO," the 2018 U.S. Nuclear Posture Review concluded. "In the future, it is possible that China could adopt a similar doctrine. Developing and fielding (sea-launched cruise missile-nuclear) signal

the leaders of nuclear competitors in a concrete way that the United States has the capability and will to maintain operationally effective nuclear options to deter regional aggression."

The SLCM capability could also help allay the concerns of regional allies shielded by the U.S. nuclear umbrella, officials said.

The United States having such a capability would make any adversary think twice about using nuclear weapons. Without requiring nuclear testing or violating any treaty, the SLCM "will lower the risks of nuclear conflict, bolster the confidence of allies and restore a degree of balance in non-strategic nuclear weapons that could create conditions more conducive to addressing this category of forces through arms control," the posture review says.

<https://www.defense.gov/Explore/News/Article/Article/2299140/nuke-sea-launched-cruise-missile-would-bolster-deterrence-officials-say/>

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USNI News (Annapolis, Maryland)

Sub Base Kings Bay Keeping Current Ohio Subs Ready, Prepping for Incoming Columbia Class

By Megan Eckstein

Aug. 3, 2020

ABOARD BALLISTIC MISSILE SUBMARINE USS ALASKA, AT NAVAL SUBMARINE BASE KINGS BAY, Ga. – The East Coast's ballistic missile submarine hub is busy keeping up the readiness of its legacy Ohio-class boomers while also laying the groundwork to welcome the new Columbia class later in the decade.

The base's challenge with the Ohio-class ballistic missile (SSBN) and guided-missile (SSGN) variants located here is twofold: most immediately, the base is located near the Florida-Georgia line, with both states being hotspots for the COVID-19 virus. More broadly, the base is supporting submarines that have started surpassing their original expected service lives, with the Ohio class originally being planned for 30 years of operations but some boats now well on their way to the revised 42-year life expectancy.

USNI News was invited to the base when Defense Secretary Mark Esper visited on July 30 to check on how the workforce was performing during the pandemic.

The base is home to six SSBNs and two SSGNs, as well as the Trident Refit Facility that performs repairs, modernization and overhauls on these boats; the Trident Training Facility; and the Strategic Weapons Facility, Atlantic that supports the submarine-launched nuclear weapons the submarines deploy with. Kings Bay was designed in the 1970s to be completely focused on supporting the Ohio-class boats and the nuclear weapons they carry on their stealthy patrols.

And yet, in just eight years, the base will have to take on a second class of submarine that is larger, has fly-by-wire control systems and will have different maintenance and modernization needs.

As a result, the base is busy keeping up maintenance work, crew training and deployment activities for the Ohio boats even as construction activities begin to make way for USS Columbia's (SSBN-826) delivery to the fleet at Kings Bay in 2028.

"America's ballistic missile submarines remain the most survivable and powerful deterrents on earth. Nuclear modernization is a top priority, especially in our efforts to implement the National Defense Strategy," Esper told USNI News.

“We have made great strides in recapitalizing the strategic nuclear triad, as well as maintaining the strength and reliability of our nation’s nuclear deterrent.”

Readiness of Aging Subs

Defense Secretary, Dr. Mark T. Esper, tours the Ohio-class ballistic-missile submarine USS Rhode Island (SSBN 740) (Blue) with Rear Adm. John Spencer, Commander, Submarine Group Ten, during his visit to Naval Submarine Base Kings Bay, Ga., on July 30, 2020. The base is home to all East Coast Ohio-Class submarines. US Navy photo.

USS Alaska (SSBN-732) is pier-side at the submarine base, undergoing a major renovation that its designers never planned for. The Ohio class of submarines was built to last for 30 years, but during the 1990s the Navy asked builder General Dynamics Electric Boat to look into what it would take to extend the service life out to 42 years. The calculations that were made 25 years ago are now proving themselves in real life, as the fleet continues to deploy boats that are well into their 30s now and have surpassed the longest service life of a previous U.S. submarine: USS Kamehameha (SSBN-642), which lasted 36 and a half years.

Cmdr. Adam Thomas, the commanding officer of the Alaska gold crew, told USNI News that his submarine is in a year-long maintenance and modernization period in which tanks are being blasted, inspected and re-coated; the sonar and fire control systems are being torn out and replaced with new systems; and the nuclear propulsion system is being maintained to ensure it can operate for the remaining eight years of its life.

This kind of year-long overhaul happens every 10 years or so, meaning this third such overhaul was never originally planned for the sub.

“What we’re seeing age-wise is what you’d expect from a 34-year-old boat,” Thomas said during a tour of the submarine, noting that nothing specifically was wrong with the sub but that there was a lot of routine maintenance work that needed to be done.

He added that there was additional pressure during maintenance periods like this one to get everything right: with the subs being so old and many parts manufacturers no longer in business, there’s no room for error.

“This is all we have,” he said of the parts supply, adding that they can’t raid other submarines for parts either because the operational tempo of the fleet is so high.

Each of the Ohio-class SSBNs and SSGNs had to undergo a refueling at the 30-year mark, since the subs’ nuclear reactors were built for exactly 30 years of service. The refuelings took place at Norfolk Naval Shipyard on the East Coast and at the Puget Sound Naval Shipyard and Intermediate Maintenance Facility on the West Coast.

USNI News previously reported that each of the two public shipyards was working on its final SSBN refueling now. USS Wyoming (SSBN-742) will wrap up at Norfolk by the end of this summer, and then Puget will finish the very last refueling with USS Louisiana (SSBN-743).

The rest of the maintenance work for the East Coast Ohio subs falls to the workforce at Kings Bay’s Trident Refit Facility, which has a dry dock for out-of-water work and helps ship crews conduct pier-side work as well.

COVID Considerations

Defense Secretary, Dr. Mark T. Esper, bumps elbows with Capt. Bill Patterson, commodore, Submarine Squadron 16, prior to his tour aboard the Ohio-class guided-missile submarine USS Florida (SSGN 728) (Gold) during his visit to Naval Submarine Base Kings Bay, Ga., on July 30, 2020.

Ohio-class guided-missile submarines are capable of carrying up to 154 tomahawk land-attack cruise missiles. The base is home to all East Coast Ohio-Class submarines. US Navy photo.

The boomers that deploy from Kings Bay have a blue/gold crew manning construct, and the crews swap out every three months or so to keep the submarine on station for long stretches of time while allowing the crew time at home with family and time for training and re-certifying for critical skills.

However, with COVID-19 posing a threat to personnel everywhere, and especially in hotspots with high positivity rates like Georgia, the Navy has to be particularly careful with personnel at this submarine base.

Thomas told USNI News that the deploying crews have a carefully scripted plan that involves going into an individual restriction of movement (ROM) period, quarantining together as a crew, and then finally deploying under the water – with several mandatory COVID tests along the way.

Masks are mandatory on the base, and for subs like Alaska that are undergoing maintenance work, temperature checks and health screenings are done for all personnel – sailors, contractors, visitors – that come aboard the sub pier-side.

Thomas said only about a quarter of the submarine's crew is actually living aboard the sub right now during its year-long maintenance period, and so the dozen nine-person berthing rooms on the boat have been limited to three sailors apiece to allow for social distancing.

"Max occupancy: 3. Limited Occupancy in this space as a COVID-19 mitigation," reads a sign displayed in one of the bunk rooms.

Thomas said his sub at the beginning of the pandemic moved to a duty section rotation that further allows for physical distancing, and the lunch hour was expanded to a two-hour period to avoid gathering too many people at once.

"As a commanding officer, I feel that the Navy has given me the tools that I need" to keep the crew safe and virus-free, he said. "We've learned a lot [since the pandemic first started] and we've been very effective at managing it."

Looking Forward to Columbia

The Strategic Weapons Facility, Atlantic, is one of the commands at Naval Submarine Base Kings Bay, Ga.. It handles the East Coast arsenal of submarine-launched nuclear weapons, which the Ohio-class SSBNs carry on their nuclear deterrent patrols. USNI News photo.

Work has already started on the base to prepare for the first-in-class Columbia, which is on a tight construction schedule with General Dynamics Electric Boat and Newport News Shipbuilding to deliver to the Navy by 2027 and head to Kings Bay in 2028 for post-delivery testing and trials – all in preparation for the all-important deadline of an October 2030 maiden deployment.

Naval Submarine Base Kings Bay spokesman Scott Bassett told USNI News during the visit that work to recapitalize the dry dock had already begun, which was needed in part because the Columbia-class boats will be larger than their Ohio-class counterparts in terms of diameter and displacement.

The dry dock modernization, which could cost as much as \$592 million, will "provide extensive repairs to and modernize the dock for use by Trident Refit Facility," he said.

A contract for the project was awarded on March 20 to Alberici-Mortenson JV, based out of St. Louis, Mo.

Phase A includes construction of temporary facilities for operations that will be displaced during the overhaul of the dock; overhaul and repair of the steel caisson; and procurement of long-lead materials for the recapitalization, Bassett said. Phase A is expected to be complete in July 2021.

Phase B provides for concrete repairs in various locations throughout the dry dock; overhauls the bridge cranes; upgrades power distribution, chilled water and the fire detection and alarm system; replaces sluice gates and actuators; replaces all piping; and will upgrade control systems, electronic components and the auxiliary seawater system, he said. This phase will also repair corroded steel members of the dry dock superstructure and re-coat the entire superstructure and replace roof and wall panels. Phase B is planned for completion in October of 2022.

Phase C, the final phase of the project will repair the utility tunnel and replace utility service building equipment and the command, control, communications, computers and intelligence (C4I) infrastructure, Bassett said. Phase C is planned to complete in April 2023.

In order to meet the tight deadlines of this project, Naval Facilities Engineering Command (NAVFAC) Southeast established a Construction Management Office on site at NSB Kings Bay with dedicated resources capable of supporting 24 hours a day activities.

In addition to the dry dock overhaul, the Trident Training Facility will also be expanded to accommodate classrooms for two separate classes of submarine – something the base has not had to handle before. From the time Columbia delivers until the final Ohio-class SSBN decommissions around 2040, Kings Bay will have to support two classes of submarines simultaneously.

In Fiscal Year 2023, NAVFAC Southeast will build the Columbia Trainer Expansion onto the training facility, along with conducting mechanical and electrical systems repairs to the current training facility. The Columbia trainer and the mechanical repairs are expected to cost more than \$10 million each, with the electrical repairs expected to cost between \$5 million and \$10 million.

<https://news.usni.org/2020/08/03/sub-base-kings-bay-keeping-current-ohio-subs-ready-prepping-for-incoming-columbia-class>

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Air Force Magazine (Arlington, Va.)

Airmen on Navy Command Jet Test-Launch Three-Tipped, Unarmed Nuclear Missile

By Brian W. Everstine

Aug. 4, 2020

Air Force missileers aboard a Navy E-6B Mercury nuclear command plane launched a three-tipped, unarmed Air Force nuclear missile from Vandenberg Air Force Base, Calif., in an unusual but long-planned exercise Aug. 4.

Sailors and Airmen from Offutt Air Force Base, Neb., aboard the E-6B worked with Airmen from Vandenberg who acted as the alert and operational crews on the ground for launch night.

At 12:21 a.m. local time, the missile and its three test re-entry vehicles—which would carry the nuclear warhead in a real launch—left California and flew for about 30 minutes to splash down 4,200 miles away at the Kwajalein Atoll in the Marshall Islands.

“The flight test program demonstrates one part of the operational capability of the ICBM weapon system,” Col. Omar Colbert, commander of the 576th Flight Test Squadron at Vandenberg, said in an Aug. 4 release. “The Minuteman III is 50 years old, and continued test launches are essential in

ensuring its reliability until the 2030s when the Ground-Based Strategic Deterrent is fully in place. Most importantly, this visible message of national security serves to assure our allies and dissuade potential aggressors.”

Air Force Global Strike Command vets the 1970s-era unarmed missiles a few times a year to ensure they are still accurate and reliable. This is the second test launch of a dummy Minuteman III intercontinental ballistic missile in 2020. Vandenberg held its first test launch of the year in February, when the base offered reporters a rare peek into launch-night operations.

The test is notable because Global Strike does not often test missiles configured with multiple re-entry vehicles, which were phased out to comply with the New START treaty between the U.S. and Russia. The command did not immediately answer why the exercise featured a multi-tipped weapon.

The Air Force last tested an ICBM with three re-entry vehicles in April 2018, The Drive reported.

The service said the test, previewed in an April press release, is not responding to any real-world events or regional tensions. Global Strike’s launch calendars are planned three to five years in advance.

Airmen from the 90th Missile Wing at Malmstrom Air Force Base, Mont., were originally chosen to support the launch, but could not travel because of restrictions in place during the ongoing coronavirus pandemic. The missile itself came from Malmstrom and maintained by the 90th Maintenance Group.

The pandemic posed an opportunity to instead vet the E-6B, one of the military’s aircraft that can give the order to fire nuclear weapons in case underground launch control centers are destroyed. The Pentagon is preparing to replace the E-6B and the Air Force’s E-4B “Doomsday” plane with an “optimized fleet” dubbed the Survivable Airborne Operations Center.

The flying emergency command centers occasionally participate in the tests to check how well they can talk to and direct the ICBM fleet, as well as to see whether upgrades are working.

“Even during the pandemic, Air Force Global Strike Command maintains various levels of redundant capability to assure a national deterrent,” the service said.

<https://www.airforcemag.com/navy-command-jet-test-launches-three-tipped-unarmed-nuclear-missile/>

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National Defense (Arlington, Va.)

Chinese Nuclear Advancements Stoke Pentagon Fears of New 'Peer' Threat

By Yasmin Tadjdeh

July 30, 2020

China is making inroads in developing a robust nuclear triad that could put it on par with the United States, said the head of Strategic Command July 30. ^[1]_{SEP}

A nuclear triad consists of air-, ground- and sea-based weapons.

“China is on a trajectory to be a strategic peer to us by the end of the decade,” said Adm. Charles Richard. “For the first time ever, the U.S. is going to face two peer capable nuclear competitors ...

who you have to deter differently," he said referring to China and Russia. "We have never faced that situation before."

The 2018 National Defense Strategy identified both Beijing and Moscow as great power competitors.

The United States' strategic deterrent in coming years will be tested in ways that it hasn't been before, Richard said during remarks at a virtual event hosted by the Mitchell Institute for Aerospace Studies.

"We need to be ready to answer that," he said. "The threat is significant."

Richard noted that Beijing is bolstering its atomic arsenal by investing in air-launched systems, a change in its approach from previous eras, Richard said. "They are about to finish building out for the first time an actual triad by adding a strategic capability to their air leg."^[1]_{SEP}

China so far has yet to deploy a formidable nuclear bomber force, according to the Center for Arms Control and Non-Proliferation, a bipartisan nonprofit based in Washington, D.C. The air-based leg of its triad has historically been a low priority for the country, it noted.

"China currently possesses a small number of air-based platforms for nuclear weapon delivery, but is expected to bring a new strategic bomber and air-launched ballistic missiles into operation," according to a fact sheet produced by the center. "That may include the development of a new nuclear-capable subsonic strategic stealth bomber, the Xian H-20, which could enter service as early as 2025."^[1]_{SEP}

The H-20 will be similar to the U.S. B-2 bomber, according to the organization.^[1]_{SEP}

Richard said he could not go into great detail regarding China's nuclear pursuits, but he warned that Beijing is expanding its capabilities across the board.^[1]_{SEP}

"They have new command and control. They have new warning. They have better readiness," he said. "While they espouse a minimum deterrent strategy, they have a number of capabilities that seem inconsistent with that."^[1]_{SEP}

China is estimated to have about 300 nuclear weapons — a fraction of the 1,500 or so strategic warheads currently deployed by the U.S. military — and has previously espoused a strategy known as "minimum deterrence," which seeks to ensure that a nation would have a sufficient second-strike capability if it were to suffer a nuclear attack.

However, Beijing has the capability to execute any number of strategic employment strategies, not just a minimum deterrent, Richard said.^[1]_{SEP}

The United States is not standing idly by as China modernizes its forces. The Pentagon is in the process of upgrading all three legs of its triad, to include a new B-21 stealth bomber, Ground-Based Strategic Deterrent, Columbia-class ballistic missile submarines, and air-launched cruise missiles known as the Long Range Stand Off weapon.

U.S. defense officials tout the benefits of each leg of the triad. Bombers are flexible because they can be recalled and can be used for signalling adversaries; submarines are the most survivable because of their stealthiness; and ground-based intercontinental ballistic missiles are the most responsive to a surprise attack, advocates say.

Meanwhile, some observers in the United States are wary of the high price tag associated with modernizing, operating and maintaining the triad, which is estimated to cost more than \$1 trillion over the next 30 years. Some lawmakers and others have called for scaling back or eliminating the

ground-based leg of the arsenal, although the idea has yet to gain significant political traction in Washington, D.C., in recent years.

<https://www.nationaldefensemagazine.org/articles/2020/7/30/chinese-nuclear-advancements-stoke-pentagon-anxiety>

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US COUNTER-WMD

Defense One (Washington, D.C.)

US Missile Defenses Are About to Level Up

By Patrick Tucker

Aug. 4, 2020

The Army is just “20 months away” from fielding its first laser battalion. In the next two years, the U.S. military expects to give soldiers in ground vehicles their own lasers that can shoot down missiles, demonstrate that sailors can knock down ICBMs with missiles fired from surface ships, and stand up two new counter-Russian missile defense sites in Eastern Europe.

It’s all part of a series of soon-to-come innovations in missile defense aimed at deterring Russia, China, Iran, or any other adversary with destruction in mind, outlined by militaries at the virtual Space Missile Defense symposium on Tuesday.

Among the key ones is the Maneuver Short-Range Air Defense, or MSHORAD, basically a Stryker vehicle outfitted with anti-missile defenses, including the laser-equipped DE-MSHORAD. “Expect to have the first battalion fielded in 2021 with four battalions by 2023,” Lt.Gen. Dan Karbler, commander of the U.S. Army Space and Missile Defense Command, told the audience.

Lieutenant General L. Neil Thurgood, director for Hypersonics, Directed Energy, Space and Rapid Acquisition in the Office of the Assistant Secretary of the Army, said that the 50 kw laser-mounted Stryker was coming in 2022. The service is also working on 200 kw truck-mounted laser dubbed, IFPC-HEL that Thurgood said would be deployable (although not necessarily deployed) by FY 2024 at the platoon level. By the next year, the Army wants to field an even more powerful laser, the 300 kw Indirect Fire Protection Capability-High Energy Laser, or rIFPC-HEL.

The Army also wants to outfit maneuvering units with mobile microwave weapons, which, Thurgood said, are more useful against drone swarms than lasers, as microwaves can destroy the electronics of more targets at once. But directed microwaves, built at scale, don’t fit easily on a truck. Scientists are reducing the size and weight and making this more feasible.

The Pentagon’s Missile Defense Agency hopes that by the end of next year in Europe, a new Aegis Ashore missile interceptor site will have been completed in Poland (after delays due, in part, to COVID-19.) “We are seeing an uptick in terms of the Army Corps construction,” Adm. Jon Hill, director of the Missile Defense Agency, said. “We’re really going to go hot in 2021,” toward a projected 2022 completion, he said.

Next year will also see another test of the Navy’s ability to shoot down ICBMs using SM3 missiles aboard an Aegis destroyer, working with other radar, via the so-called Sea-Based Weapons System, or SBWS.

“We are now set,” said Hill. “The ship will maneuver and launch an SM3-IIA... to take on an ICBM threat.” MDA and the Navy also will test the SBWS against a medium-range ballistic missile, and in a separate test against two separate short-range ballistic missiles, he said.

Next year will also mark a key one for the new next-generation interceptor program, an effort to build new missiles capable of hitting more advanced ICBMs that deploy decoys or multiple warheads. MDA went back to the drawing board on the project last August, canceling the program. It drafted a new request and re-awarded it to Northrop Grumman in May.

MDA has “paused” its program to design an interceptor that could potentially take out hypersonic missiles, Hill said, to look at near-term options. But the hypersonic threat is only building. That means that a new request could emerge next-year, which could speak to the feasibility of different concepts for countering hypersonic missiles.

All of this activity reflects the growing importance the U.S. is placing on deterring and defending against missile proliferation worldwide. Congress put missile defense under the undersecretary of defense for research and engineering in 2018. Budget requests and appropriations for the Missile Defense Agency have shrunk since then as services have taken on more of the “missile defense” role for themselves.

New missiles and missile defense technology are highly desired by U.S. allies in Europe, the Middle East, and Asia, as Russia, Iran, China and others have armed with the fast and low flying weapons, some threatening to top them with nuclear warheads, and as arms control agreements have expired or are set to, shortly. At the end of July, for instance, Russia announced that nuclear-armed hypersonic missiles would be deployed aboard ships.

<https://www.defenseone.com/technology/2020/08/us-missile-defenses-are-about-level/167462/>

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Defense News (Washington, D.C.)

Lockheed Dives into Next-generation Missile Defense Interceptor Competition

By Jen Judson

Aug. 3, 2020

WASHINGTON — Lockheed Martin said it will compete to build the Missile Defense Agency’s Next-Generation Interceptor designed to protect the homeland against intercontinental ballistic missile threats from North Korea and Iran.

The company is “excited to confirm that we are putting in a bid for the Next-Generation Interceptor,” Sarah Reeves, Lockheed’s vice president of missile defense programs, told reporters Aug. 3.

Bids were due July 31.

Boeing and a Raytheon-Northrop Grumman team have already announced their intentions to compete to develop and field the agency’s new interceptor following the cancellation of the Redesigned Kill Vehicle meant to replace the warhead on the current Ground-Based Interceptors. Those missiles are part of the Ground-based Midcourse Defense System, which is operational at Fort Greely, Alaska, and Vandenberg Air Force Base, California.

The RKV program was paused in May 2019 and then abruptly terminated in August 2019 due to insurmountable technical issues resulting in delayed schedules and cost increases. The Defense

Department announced at the time that it would embark on an entirely new program to field a future interceptor.

MDA now plans to downselect to two companies, which will then compete for the right to build the interceptor.

Lockheed had one of three small contracts to design a kill vehicle that could take out multiple warheads several years ago that would lead to a program that would replace the RKV called the Multi-Object Kill Vehicle (MOKV) program. Raytheon and Boeing had won the remaining two contracts.

Reeves stressed the need for the new interceptor to be able to go after threats that disperse multiple objects including decoys.

"We are looking carefully at the lessons learned from RKV including parts survivability testing which, in that program, was done too late and caused a major system redesign, as well as ensuring early-and-often testing and fly-before-you-buy mentality," Reeves said.

Lockheed plans to conduct two successful flight tests before going into production, Reeves said, which as an MDA program requirement.

"The time is right now," Reeves said. "We have significant investments and the technology a couple of decades ago, when this was initially a vision of MDA, wasn't quite there, but now it is ready to go."

The company plans to take elements from its existing capabilities such as the Terminal High Altitude Area Defense (THAAD) system, which Reeves said has had a 100 percent mission success rate, and the Aegis missile defense system. Lockheed also will garner experience from its partnership with the U.S. Navy on its Trident II submarine-launched ballistic missile system, which "has to survive these more hostile environments," she said.

And Lockheed's experience with space is another asset that will contribute to understanding technology needed for an NGI, which will need to travel through space, according to Reeves.

Lockheed is also optimistic, Reeves said, that it can meet a faster schedule for NGI than currently planned.

Some Defense Department officials said NGI could not be fielded until the 2030s but the MDA director and U.S. Northern Command's commander believe it is possible to move that timeline to at least 2028 or earlier.

The company plans to use tools such as artificial intelligence, machine-to-machine learning, big data analytics and 3-D printing to "accelerate the schedule and to deliver products faster than we have had in the past," Reeves said.

<https://www.defensenews.com/industry/2020/08/03/lockheed-dives-into-next-generation-missile-defense-interceptor-competition/>

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Department of Defense (Washington, D.C.)

Missile Agency Director Describes Threat, Countermeasures

By David Vergun

Aug. 4, 2020

In recent years, threats from new missile systems against the homeland, deployed forces and friends and allies have arisen from Russia, China, North Korea and Iran, the director of the Missile Defense Agency said.

Navy Vice Adm. Jon A. Hill spoke today at the Space and Missile Defense Symposium in Washington.

At one time, the MDA focused on the ballistic missile threat. However, adversaries have designed extremely fast and maneuverable advanced cruise missiles and hypersonic weapons that make for "a very tough environment for defense," Hill said. The Missile Defense Review addressed these new threats, laying out a path to follow in developing new offensive and defensive measures, he added.

Though defense is a key part of deterrence, Hill said, "you can't shoot what you don't see." Providing that sight are sensors and radars aboard ships, on the ground and in space.

Space-based sensors are the ultimate, Hill said, because they can provide global coverage. Space tracking and surveillance systems collect data, intelligence and real-world missile testing, he said, but that capability is nowhere near where it needs to be.

Sensors start the kill chain by sending out a warning, the admiral explained. Then, radars track the missile, and fire control launches a defensive projectile.

This projectile can come from a Patriot system or Terminal High Altitude Area Defense system, all operated by the Army, or the Standard Missile 3 Block IIA or the Aegis Ballistic Missile Defense System, both operated by the Navy. Besides those defenses, ground-based interceptors, operated by the Army, are deployed at Fort Greely, Alaska, and at Vandenberg Air Force Base, California.

The command and control and battle management system, fully protected with cybersecurity measures, ties these systems together with the operators.

Many missile defense components are in the research, science and technology and demonstration phase, Hill said. For example, work is being done on the next-generation interceptor and long-range discrimination radar, as well as space-based sensors.

"Where we live today is we don't have everything we want deployed in space, nor do we have the terrestrial or mobile sea-based sensors where we want, where we need them at the right time," the missile agency director said.

Besides new, cutting-edge systems, Hill noted that current systems such as Aegis and command and control are receiving important upgrades as they become available.

MDA is working with the Army to integrate the THAAD and Patriot systems so operators can communicate with both and shoot with either, depending on the scenario, the admiral said.

Allies and partners are developing their own missile defense systems or buying them from the United States through the foreign military sales system, Hill said. These systems used by friends and partners furthers global security, he pointed out, and the Defense Department is working to better integrate those systems so they're even more effective.

A building that looks like the bridge of a Navy ship on land.

Though the COVID-19 pandemic has presented challenges, Hill said, that hasn't affected MDA's ability to perform its mission: "If you ask me where we took risk during the global pandemic, we never took any risk in supporting the warfighter," he said. "We continue to deliver capability, we continue to support major movements around the globe." Delivery of systems caused some delay, he acknowledged, because assembly lines require people in confined and enclosed places.

Hill termed his MDA team and those in the services as stellar, and he said there's no nobler calling than defending America.

<https://www.defense.gov/Explore/News/Article/Article/2300126/missile-agency-director-describes-threat-countermeasures/>

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US ARMS CONTROL

Bloomberg via Stars and Stripes (Washington, D.C.)

A New Nuclear Model Could Upend How Countries Count Bombs

By Jonathan Tirone

July 30, 2020

Nuclear analysts from the U.S. and Russia settled on a new method to account for atomic weapons that may shrink estimates on the size of North Korea's arsenal and could be used to aid future disarmament.

Accounting for nuclear material stockpiled by countries is at the heart of the global arms-control system and plays a central role in verifying disarmament agreements. Publication of the new model in a forthcoming edition of Janes Intelligence Review comes as diplomats from the two countries with the biggest nuclear stockpiles convene in Vienna to discuss an extension of a treaty to limit the number of deployed weapons.

"You cannot agree to get rid of something unless you know how many there are," said Robert Kelley, a former nuclear-weapons engineer at the Department of Energy, who helped create the new accounting method with Vitaly Fedchenko, a Russian nuclear physicist who works at the Stockholm International Peace Research Institute.

While figuring out the number of warheads in the arsenals of nuclear states has long been the focus of intelligence and military-planning officials, it's also increasingly become an important number for researchers and diplomats promoting new approaches to eliminating atomic weapons.

"Accounting for weapons-fissile material is one important piece of the puzzle," said Alicia Sanders-Zakre, who coordinates research around the Treaty on the Prohibition of Nuclear Weapons. That document is gaining traction, requiring ratification from only 10 more countries for it to come into force.

"This sets up an international framework for the elimination of nuclear weapons and technical research on weapons material accounting helps fill out that framework," said Sanders-Zakre from the Geneva-based headquarters of the International Campaign to Abolish Nuclear Weapons, which won the 2017 Nobel Peace Prize.

The new model challenges public nuclear stockpile figures that "generally estimate the size and proliferant stockpiles by using simple models, largely ignoring thermonuclear stages and

competing demands for nuclear materials and tritium," wrote Kelley and Fedchenko in their paper, which was reviewed by U.K. defense and security officials to ensure classified information wasn't divulged.

Using North Korea as a case study, the researchers deconstructed the plutonium and highly enriched uranium requirements for a two-stage thermonuclear weapon, which differ dramatically from simple single-stage devices modeled in most current studies. Countries with thermonuclear devices — the likes of which Kim Jong Un is now widely suspected to possess — have greater challenges when it comes to managing the material demands of plutonium, uranium and tritium in their weapons, according to the authors.

The new model may prompt security experts to reassess their figures.

"Janes concludes that North Korea's nuclear arsenal is most likely to be in the range of 10-20 weapons if Pyongyang committed its highly enriched uranium to thermonuclear weapons production," said the article, which will appear in the open-source agency for defense intelligence this week. That figure is at least two-thirds lower than the 60 nuclear-warhead estimate formulated by the Defense Intelligence Agency and published July 14 by the Congressional Research Service.

<https://www.stripes.com/news/a-new-nuclear-model-could-upend-how-countries-count-bombs-1.639343>

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Reuters via VOA (Washington, D.C.)

US Pushes Ahead with Bid to Extend Iran Arms Embargo

By Reuters

Aug. 5, 2020

NEW YORK/WASHINGTON - The United States is pushing ahead with its bid to extend an international arms embargo on Iran by way of a second draft U.N. Security Council resolution, despite what some diplomats say is a lack of enthusiasm for such a move among its 15 members.

The U.S.-drafted resolution needs at least nine votes in favor to force Russia and China to use their vetoes, which Moscow and Beijing have signaled they will do. Some diplomats question whether Washington can even secure those nine, however.

"We have tabled a resolution that we think accomplishes what we think needs to be accomplished," U.S. Iran envoy Brian Hook told the Aspen Security Forum, held virtually, on Wednesday.

"The easy way is to do a rollover of the arms embargo," he said. "It's not difficult. There's all the reasons in the world to do it. But we will do this, one way or another."

The arms embargo on Iran is set to end October 18 under Tehran's 2015 nuclear deal with world powers, which Washington quit in 2018.

The second draft circulated by Washington is virtually unchanged from the first text shared with the council in June.

Return of all sanctions

If the United States is unsuccessful in extending the embargo, it has threatened to trigger a return of all U.N. sanctions on Iran under a process agreed to in the 2015 deal.

Such a move would kill the deal, touted as a way to suspend Tehran's suspected drive to develop nuclear weapons. Washington argues it can trigger the sanctions because a Security Council resolution still names it as a participant.

Iran has breached parts of the nuclear deal in response to the U.S. withdrawal and Washington's reimposition of sanctions.

"For as long as Iran is allowed to enrich, we're going to be having this discussion: How close is Iran to a nuclear breakout? ... We need to restore the U.N. Security Council standard of no enrichment," Hook said.

Iran denies it is seeking to build a nuclear bomb.

Diplomats say Washington would face a tough, messy battle if it tried to trigger a return to sanctions.

The United States would have to submit a complaint to the council, which would then have to vote within 30 days on a resolution to continue Iran's sanctions relief. If such a resolution is not put forward by the deadline, sanctions would be reimposed — what is known as a snapback.

Some diplomats have suggested the United States will submit its complaint by the end of August to ensure the 30 days ends in September, before Russia takes the monthly rotating council presidency in October.

<https://www.voanews.com/usa/us-pushes-ahead-bid-extend-iran-arms-embargo>

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Middlebury Institute (Monterey, Calif.)

Machine Learning Applications in Nonproliferation

By Jamie Withorne

Aug. 4, 2020

Machine learning and artificial intelligence have recently made significant advances in the fields of data science and data analysis. Applying machine learning algorithms to issues of nonproliferation has the potential to pave the way for innovative solutions within the field of nuclear policy.

While nonproliferation is complex work done by a variety of organizations and requires an incredibly vast amounts, and different types of data, this report focuses on applying machine learning tools to supplement existing strategic trade controls on dual-use goods. When implementing strategic trade controls, it can be difficult for relevant officials to accurately and efficiently identify individual, controlled items, particularly when items are dual-use in nature. Images of these items are publicly available online, but officials do not necessarily use such resources in screening potential items of concern, nor do they always have the technical expertise necessary to positively identify controlled items. This report seeks to begin to address challenges in identifying proliferation-sensitive goods by applying machine learning image classification models.

Specifically, the goal of the research team was to assess the potential utility of machine learning algorithms to classify relevant images of dual-use good as a supplementary tool for detecting potential violations of strategic trade controls.

The models developed and discussed in this report are algorithms that autonomously classify images using a type of predictive analysis. Analyzing these models demonstrates how machine learning image classification tools may supplement traditional strategic trade controls to bolster

nonproliferation efforts. Using Python and advanced analytics, the report demonstrates how machine learning applications can strengthen US nonproliferation commitments.

The report details: relevant dual-use items of interest and selection methodology, a dataset of weapons of mass destruction-related equipment, successful machine learning model development and evaluation, and potential wider applicability of machine-assisted identification for nonproliferation-related uses.

<https://www.nonproliferation.org/machine-learning-applications-in-nonproliferation-assessing-algorithmic-tools-for-strengthening-strategic-trade-controls/>

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COMMENTARY

Minot Daily News (Minot, N.D.)

Minot Air Force Base is Cornerstone of U.S. National Defense

By Sen. John Hoeven

Aug. 1, 2020

Ambassador Marshall Billingslea's visit to Minot Air Force Base this week demonstrates what Theodore Roosevelt meant when he said "speak softly and carry a big stick." As the President's Special Envoy for Arms Control, Ambassador Billingslea's words as a diplomat carry great weight thanks to the awesome power of the missiles and bombers residing just northeast of Roosevelt's North Dakota ranch. I spoke with Ambassador Billingslea prior to his visit to Minot to outline the vital importance of the nuclear forces at Minot Air Force. They provide the cornerstone of our national defense, and also underwrite our nation's credibility when confronting our adversaries like China and Russia. The maintenance and modernization of our nuclear force must therefore remain a top priority.

The fall of the Soviet Union could have meant the end of nuclear competition with Russia. Instead, Russia has engaged in a multi-decade program to upgrade its weapons systems, develop new nuclear arms, and modernize its warheads. Meanwhile, the U.S. stopped upgrading its nuclear forces and now relies on equipment that has been extended well beyond its originally intended service life.

China presents another nuclear challenge. Beijing's claim that it has only a minimal deterrent is undermined by aggressive efforts to deploy a nuclear triad of missiles, bombers and submarines while disclosing few details about the size and posture of its arsenal. These forces will continue to become larger and more capable until Beijing demonstrates otherwise.

As a member of the Defense Appropriations Committee, I am committed to strengthening our deterrent in the face of these growing challenges. This includes providing funding to replace our ICBM fleet and our nuclear cruise missiles, upgrading the B-52 with new engines and radars, and procuring modern helicopters to secure the missile fields. Also, through my position on the Energy and Water Appropriations Committee, I continue to support funding to keep our nuclear warheads safe and effective, including the warheads carried on our ICBMs and the nuclear cruise missiles at Minot Air Force Base.

President Trump has asked whether China and Russia would be willing to join negotiations that could improve stability and launch what Ambassador Billingslea has called "a new era" in arms control. Some in Washington, however, believe that pursuing an arms control agreement means we do not need to modernize our forces. This is short sighted. As he testified last week, efforts to reach an effective agreement go "hand-in-hand" with modernizing our nuclear forces. Upgraded nuclear forces can help ensure that Ambassador Billingslea is able to negotiate from a position of strength.

Credible and capable U.S. nuclear forces must be a top priority. We wish Ambassador Billingslea well as he begins new arms controls discussions and appreciate his visit to Minot Air Force Base to review our nuclear deterrent first-hand. Whether these negotiations are able to garner greater cooperation, we can remain proud that in defense of the American people and in support of our nation's diplomacy, Minot Air Force Base continues to carry the big stick.

<https://www.minotdailynews.com/opinion/community-columnists/2020/08/minot-air-force-base-is-cornerstone-of-u-s-national-defense/>

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National Interest (Washington, D.C.)

How Great-Power Politics Will Be Used in an Asymmetric Era

By Christopher England

Aug. 5, 2020

Observers of international conflict often find themselves divided between two intellectual camps. On the one hand, traditional realists continue to argue that great-power war remains the gravest challenge in the twenty-first century, and they focus attention on measures of hard military power and the risk of war with old rivals like Russia, China, and Iran. On the other hand, many continue to argue that nuclear deterrence and economic interdependence have made war between the great powers less likely to erupt than ever before. Instead, they urge policymakers to focus on the shifting mélange of problems that have emerged to fill the void, including global terrorism, state failure, climate change, cybercrime, and an endless blitz of “fake news.”

Direct Expose

However, it is becoming increasingly clear that this old debate presents us with a false dichotomy: either great-power wars remain the major strategic challenge, or policymakers should devote most of their resources to countering substate groups, low-intensity violence, and nonconventional threats like economic espionage or state-sponsored disinformation campaigns. As John Mearsheimer, the doyen of American realism, put it in a 2018 debate, “I do think that the Russians are a low-level threat in social media, but who really cares?”

Unfortunately, the trajectory of events in recent years has shown that both sides are correct. We now inhabit the world of both, one where great powers deliberately foster nonconventional and asymmetric threats on a massive scale inside opposing states in order to destabilize their societies, damage their economies, and corrode their legitimacy at home and abroad. It should be evident by now that these tactics can degrade the capabilities of otherwise powerful states, including the United States, in at least three ways.

First, anything that provokes pervasive uncertainty or requires expensive countermeasures (as nearly all of the new cyber capabilities do) raises the financial cost of governing and providing basic public goods. The entire state becomes more difficult to operate as things that used to become relatively cheap become relatively more expensive. The private sector is especially vulnerable, and recent studies have placed cumulative losses due to Chinese espionage and technological theft in excess of \$600 billion. This functions like a permanent tax on American innovation, which is why FBI Director Christopher Wray has called Chinese espionage the “greatest long-term threat” to the U.S. economy, adding that the Chinese Communist Party has “mobilized all aspects of Chinese society” to “steal their way up the economic ladder at our expense.”

Second, targeted disinformation campaigns can exacerbate tension between the various factions that exist within every nation—even if they do not create it. A 2019 survey from the Georgetown University Institute of Politics and Public Service showed that over half of those likely to vote now believe that America is edging toward a civil war. Did Russia create this situation? Of course not. But can Russian propaganda efforts help shift opinion a few percentage points in the wrong direction? Perhaps. The danger is that social movements have tipping points past which they tend to become self-sustaining.

Moreover, to the extent that disinformation erodes trust and reduces social linkages, such measures destroy valuable human capital. Low trust societies have higher transaction costs and tend to be less economically efficient than high trust societies. At the outer limit, if rising levels of acrimony result in visible breakdowns of public order, then popular trust in the state itself may be undermined, creating a vicious downward spiral.

Third, especially in democratic societies, in which representatives are more or less responsive to the wishes of their constituents, an increasingly divided society can harden existing divisions between different groups of ruling elites, making it more difficult to form coherent policy responses to international challenges.

Although the extent of Russian disinformation activities and Chinese cyber espionage is now well-known, many continue to view these things as a sideshow to the serious business of great-power politics. However, to ignore the increasing deployment of nonconventional instruments of power is to miss a major way that revisionist states now seek to tilt the global balance in their favor. Nonconventional measures consume resources and impair rational policy formation on a greater scale than ever before. It is, then, fair to call this an era of attrition without fighting.

For example, there is considerable evidence that Russia deliberately intervened to help funnel large groups of migrants into Western Europe in 2016, even as it gave significant support to anti-immigrant parties in countries like France and Germany. The intention here is clear: destabilize society and raise the financial cost of maintaining domestic order and providing basic public services. Targeted political donations can also help create factions within the political structure by aiding the ascendancy of new elites who view the existing ruling class as a hostile camp, and who in turn are seen by the powers that be as deplorable reprobates. The Russian presence on social media was merely a small part of this larger strategy.

Similarly, although the full story is not clear at this point, the same motivations are likely behind China's apparent role in supporting the recent wave of Black Lives Matter protests and riots across the United States, even as they continue to suppress popular movements in Hong Kong.

These issues are directly relevant to the future of American foreign policy because, throughout history, many states have delayed or altogether failed to balance against foreign rivals, simply because elites were too divided among themselves to fashion a coherent foreign policy, or because their society had become too chaotic to govern effectively. It is harder to worry about Beijing when fires are burning in Washington. In the past, to take one relevant example, so many states tried to avoid the costs of balancing Napoleon that it took twenty-two years and seven coalitions to defeat him, and many states still did not adapt to the key Napoleonic innovation of mass conscription until the twentieth century.

In order to be successful, asymmetric interventions like those described above do not have to achieve any particular outcome. The actual effect of Russia's interference in the 2016 election may have been trivial and will never be quantifiable. But that is beside the point. Success in this instance only requires that one be able to consistently raise the operating cost of rival states, putting their institutions through what is, in effect, a never-ending stress test. The goal is to force opponents to burn time and money while sowing as much dissent as possible and gumming up the policymaking process. Again, this is a strategy of attrition, no different in principle than Fabius Maximus's decision to retreat rather than fight Hannibal head-on, forcing the Carthaginian general to expend finite resources until the actual battle was a foregone conclusion.

In one sense, the United States is no stranger to the use of asymmetric techniques. The USSR spent hundreds of millions of dollars during the Cold War to fund groups in the West that favored unilateral disarmament, far more than the paltry sum that Russia invested in Facebook adds during

the 2016 election. Yet, this only begs the question: what is it about the contemporary situation that made this latter investment, minuscule by comparison, so effective?

It is also true that the United States engages in similar activities. Journalist David Sanger has even claimed that the American and Israeli release of the Stuxnet computer virus into Iranian centrifuges was the bellwether event that provoked the current cascade of information and nonconventional warfare around the world. Others have rightly pointed out that America's efforts to support pro-democratic groups inside rival states and its readiness to deploy crippling economic sanctions are, from the perspective of the regime in question, indistinguishable from deliberate subversion. Arguably, however, as the world's strongest conventional military power, the United States has been slow to utilize many of the emerging asymmetric tools in a concerted way, or even to recognize their full significance. Moreover, with its dynamic society and open public sphere, America is vulnerable in these areas in ways that China and Russia simply are not.

If "attrition without fighting" sounds like a tolerable alternative compared to the massive devastation wrought by interstate wars in the twentieth century, then it needs to be said that recent developments do not take war between the great powers off the table. The increasing use of asymmetric tools is a supplement to traditional great-power competition, not an alternative to it. Moreover, political scientists have long observed that, for obvious reasons, conflict is more likely to escalate rapidly when the survival of a governing regime is cast into doubt. This is precisely why Immanuel Kant included provisions against the subversion of other governments in his constitution for a peaceful federation. The upshot is that, over the long term, the growing use and effectiveness of asymmetric destabilization tactics might actually increase the chances of conflict between powerful states whose regimes feel under siege as never before, and whose leaders now struggle to govern societies that appear to be fragmenting from the bottom up, in part because of actions taken by adversaries abroad.

The bloody wars of the twentieth century were, among other things, a protracted process of natural selection involving three competing versions of the modern state. The liberal West embraced comparatively open societies and market economies. The fascist states, by contrast, relied on nationalist zeal and economic corporatism, with distinct bureaucratic fiefs controlling much of the economy. The communist states adopted the most centralized approach, attempting to rely on direct state planning throughout the entirety of economic and social life. For decades, these states were engaged in competition, not just on the battlefield, but also to facilitate rapid economic growth and technological innovation, maintain domestic stability, and cobble together international alliances.

The liberal state was successful during the last century not only because of what transpired in war but also because it retained enough legitimacy and ideological flexibility to consistently form the most useful alliances (even, when necessary, allying with rival states like Stalin's USSR and Mao's China). In addition, the United States and its Western allies managed to remain open societies without sacrificing domestic stability. Nor, with the significant exception of Northern Ireland, was the liberal West handicapped internally by national secessionist movements of the sort that roiled much of the communist world. Even widespread Soviet efforts at subversion and espionage were not enough to cause much disruption on the domestic political scene or to keep pace with American technological innovation, largely because the Soviets feared that advances in information processing would threaten their grip on power. Needless to say, China does not appear to be similarly deterred.

Today, none of these historic advantages can anymore be taken for granted by liberal states. Asymmetric capabilities turn old advantages into new vulnerabilities, making them a geopolitical concern of a high order.

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<https://nationalinterest.org/feature/how-great-power-politics-will-be-used-asymmetric-era-166265>

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Arms Control Wonk

Abolition and Addiction

By Michael Krepon

Aug. 2, 2020

Quotes of the week:

"It is clear that the use of such a weapon cannot be justified on any ethical ground which gives a human being a certain individuality and dignity even if he happens to be a resident of an enemy country." –Enrico Fermi and Isador Rabi, Addendum to the Report of the General Advisory Committee of the Atomic Energy Committee, 1949

"This is our purpose: to make as meaningful as possible this life that has been bestowed upon us . . . to live in such a way that we may be proud of ourselves, to act in such a way that some part of us lives on." — Oswald Spengler

It's that time of year again, when some of us think about Hiroshima and Nagasaki. For me, the atomic bombing of these two cities conveys different meanings. Hiroshima represents the prompt ending of a war that claimed over fifty million lives, a terrible sacrifice to end further sacrifice. The atomic bombing of Hiroshima and Nagasaki was "the least abhorrent choice," as a chastened Secretary of War, Henry L. Stimson, described it, one that prompted him to seek abolition.

Stimson and his boss, Harry S Truman couldn't explain to their countrymen and women why further lives would be lost in an invasion of the home islands of Japan when they had a "war winning" weapon at hand, a weapon that would finally prompt the Emperor to override the militarists around him.

The sacrifice of Hiroshima can only be justified if it has future as well as historical meaning. The historical meaning was "enough already." The future meaning is "never again."

The atomic bombing of Nagasaki conveys a different meaning for me, but it is no less significant. Nagasaki was destroyed because plans were set in motion that were not immediately stopped. The plans were executed until Truman, seeing pictures of the devastation of Hiroshima and internalizing what he had authorized, intervened. The third bomb would not be sent to Tinian. Truman could interfere with the plans he had set in motion because Japan was prostrate, having no means to strike back.

In warfare, plans are executed. In nuclear warfare, human plans will fail, whether these plans seek to control escalation or seek success through escalation. Humans affected by hubris will fail catastrophically. Humans who seek to manage or prevail in nuclear warfare will lose control of the events they have unleashed. This is the terrible lesson of Nagasaki. Its sacrifice will not be in vain if we learn this lesson.

Hiroshima and Nagasaki are here to teach us, if we are willing to learn from their sacrifice. They teach me that the goal of abolition cannot be extinguished, except at our peril. We humans need visionary end states. We need something to strive for. But how do we get there? And how do we keep up hope in times of trial?

Some believe deeply that abolition is a fool's errand. What, then, shall we call a belief system called nuclear deterrence? The kindest thing I can say about everlasting nuclear deterrence is that it is not a sustainable vision. Nuclear deterrence is a coping mechanism. It's tolerable as long as we work hard at other mechanisms to prevent use and as long as we move in the right direction.

As long as the Bomb exists, nuclear deterrence will be our constant companion. But deterrence is a very dangerous double-edged sword. Deterrence without reassurance is a recipe for battlefield use. Reassurance takes the form of arms control, in all its aspects. We cast arms control aside at our collective peril. The serial treaty killers among us – Vladimir Putin, Donald Trump, et. al. – offer endless and perhaps catastrophic sorrow. Deterrence without reassurance leaves us trapped in a brutish world with the open-ended prospect for more Hiroshimas and Nagasakis.

Nuclear weapons and nuclear deterrence are a form of addiction. Arms control isn't an addiction. It's a necessary companion to deterrence.

Some are more addicted to nuclear weapons and nuclear deterrence than others. This is an expensive habit to break. We can't break this habit individually as if we are trying to stop smoking. We have to break this habit collectively and incrementally.

Those of us who believe in the vision of abolition have differences of view about how best to reach this destination. Some believe that a Ban Treaty is a necessary answer. I salute every supporter of the Ban Treaty, but I hold a different view. I don't believe a Ban Treaty will gain the adherents it needs to take effect. It's a vehicle for believers in abolition but not for believers in deterrence. The Ban Treaty has no powers of conversion.

Some of us place faith in a progression of agreements that could result eventually in abolition. This progression would initially have to involve the two states with the largest inventories of nuclear weapons. Washington and Moscow would reduce nuclear excess in stages and then other possessors would become involved. Some of us wrote that this wasn't a mechanical process; it was instead a political and geopolitical process. Staged reductions would progress only as far as conditions allowed.

This process of staged reductions through treaties has lost momentum. Some believe we have bottomed out and that further reductions are unwise and dangerous. Trump has signed off on a digression from further reductions. It's useful, of course, to count every warhead, but to what end? And how long are we supposed to wait for what comes next?

It's possible for a new administration to retrieve New Start, and perhaps Putin and deterrence strengtheners in the United States will consent to modest further reductions. Even this is a heavy lift. A progression of treaties that point us toward zero is inconceivable under current circumstances. Domestic political and geopolitical realities do not support deep reductions leading to abolition.

What other options are available to us?

If you are addicted to smoking tobacco, you can break your habit by going cold turkey. If you are a country addicted to nuclear weapons, if other countries as well as your own citizens rely on this addiction for safety and security, and if competitors have the Bomb, you can't go cold turkey. Others must go cold turkey with you. Otherwise, you and others that depend on you will not feel safer and

more secure. When addiction is a collective problem, moving toward the end state of abolition can only occur conditionally and incrementally.

One of the many problems of having visionary beliefs is remaining attached to them when your elected officials and the world are behaving badly. In hard times, a visionary end state seems so far away as to be hopeless. Nor does it help to set a date certain for visionary end states. Visions don't pay any heed to dates or deadlines.

My vision of a world without nuclear weapons remains intact. I have a sense of being nearer to it every day, which is essential for vision maintenance.

My vision is that no nuclear weapons are used on battlefields up to and beyond the 100th anniversary of Hiroshima and Nagasaki. And that moratoria on nuclear testing remain in place between now and the 100th anniversary of Hiroshima and Nagasaki. My friend and colleague Lew Dunn passed this vision on to me. Now I'm passing it on to you.

Is this vision practical and realizable or is it wildly impractical and unrealizable?

The the aftermath of Hiroshima and Nagasaki, anyone envisioning the absence of mushroom clouds in warfare for 100 years would have been told to get his or her head examined. There have been hair-raising crises and close calls, border clashes and two limited wars between nuclear-armed states, long wars between nuclear armed states and abstainers, and wars that have ended in stalemates. But here we are 75 years later, without battlefield use.

Likewise, anyone who would have predicted that the United States, Russia, China, India and Pakistan would have honored moratoria on nuclear testing for over twenty years with the Comprehensive Test Ban in Treaty in limbo deserves some kind of prize.

Yes, North Korea hasn't reached the 20-year mark and could test again. But North Korea is an outlier. No responsible states that possesses nuclear weapons wants to act like North Korea. Another nuclear test by North Korea would confirm its outlier status.

And yes, Russia and China have conducted nuclear experiments. All states that possess nuclear weapons carry out experiments. Nuclear experiments don't help with the certification of new warhead designs. They aren't material breaches of the CTBT's object and purpose.

I'm not sure what to make of the Trump administration's last noncompliance report that asserts possible Russian experimentation above the Treaty's zero yield standard and an even hazier characterization of Chinese experimentation. The U.S. Intelligence Community has demonstrated a confirmation bias problem on nuclear testing in the past. On the other hand, Vladimir Putin is a serial treaty violator. I'm withholding judgment until a new administration calls in outside experts to review the evidence.

All this is a digression, and it's meant to be a digression by those who would like to resume testing. Experiments are happening in Nevada, at the U.S. Labs and elsewhere. They do not constitute a material breach of the CTBT. The U.S. Labs help us extend the moratorium on testing. Nuclear testing is not happening. Moratoria are holding.

My vision is to keep moratoria in place until 2045. And then beyond.

Extending the No Use and No Testing norms up to and beyond the 100th anniversary of Hiroshima and Nagasaki would be remarkable feats.

These moratoria are the best way to honor those who died and those who fought for freedom during World War II. These moratoria are also the most practical way to make progress toward the vision of abolishing nuclear weapons. Not by treaties, but one day at a time and one crisis at a time.

Thanks to the hard work of those in positions of responsibility, in the trenches, in the streets and walking the corridors of power, the norms of No Use in warfare and No Testing have already been sustained for 75 years and over twenty years – and counting.

These are the two hardest nuclear norms to break. The adjective “infamous” will apply to the national leader who breaks these norms. They can be sustained in the future the same way that they were nurtured in the past: by raising ruckuses, by paying attention, by playing for time, and by clarifying penalties.

Now imagine, as I do, how useful nuclear weapons would be in 2045 if they haven’t been used in warfare for 100 years and haven’t been tested for 47 years. By staunchly defending the two most important norms we’ve got – the two norms that are hardest to break – we pay proper homage to Hiroshima and Nagasaki. We also keep our eyes on the prize of abolition.

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Real Clear Defense (Washington, D.C.)

Negotiating with Great Powers on Nuclear Arms

By Frank Klotz, John Lauder & William Courtney August 03, 2020

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The Trump Administration has yet to decide the fate of the sole remaining U.S.-Russian nuclear arms control treaty, New START, which expires in February. Among other conditions, it insists that any follow-on nuclear accord with Russia must also include China.

Striking a deal with Beijing in the next six months is highly unlikely. Accordingly, if the U.S. should agree to extend New START it could help ensure current limits on Russian nuclear forces remain in place. It might also adopt a different, multilateral approach to engaging China in arms control talks.

The administration has a valid point about China. Under New START, the U.S. and Russia further reduced their nuclear-equipped heavy bombers, long-range missiles, and deployed warheads. China, which is not a party to the treaty, has meanwhile steadily expanded its smaller but still potent nuclear force. This build-up calls into question Beijing's intentions regarding its long-held policies of "no-first-use" and maintaining only a minimum deterrent force.

China has repeatedly rejected calls to join nuclear arms control negotiations with the U.S. and Russia and did so again earlier this month. Beijing asserts that the two nuclear superpowers must first slash their arsenals to even lower levels. Likewise, it has been reluctant to be more transparent about its nuclear intentions, claiming that secrecy is essential to the survivability of its smaller force.

But there are reasons to believe that China could be persuaded to be more open to discussions on controlling nuclear arms, particularly if they involved a broader set of negotiating partners and if a formal arms limitation treaty were not the immediate objective.

First, the timing may be propitious. China has become more isolated internationally as a result of its repression in Hong Kong, Xinjiang, and Tibet, large-scale theft of intellectual property, and early mishandling and cover-up of the COVID pandemic. Beijing might be looking for ways to appear more cooperative on the world stage.

Second, China has played constructive roles in other nuclear-related negotiations. For example, it signed the multilateral 1996 Comprehensive Nuclear-Test-Ban Treaty and participated in the international monitoring system to detect nuclear explosions around the world. Five of the system's seismic stations are on Chinese territory.

China also played a constructive role in negotiations leading to the 2015 multilateral Iran nuclear deal aimed at limiting that country's pathways to developing nuclear weapons. With U.S. encouragement, China took a lead role in redesigning an Iranian heavy water reactor that could have been used to produce weapons-grade plutonium.

Third, China may be more willing to participate in negotiations if the U.S. can persuade France and the U.K. to do likewise. All five officially recognized nuclear weapon states (the so-called "P5") collaborated successfully in the Iran negotiations. As Beijing has publicly signaled, a P5 format might be more conducive to Chinese participation than the prospect of negotiating alone with the two nuclear superpowers.

Fourth, some Chinese analysts have suggested that their country's views on nuclear transparency may be evolving due to growing confidence in the survivability of its nuclear forces and because secrets are increasingly hard to keep in a world of high-resolution commercial satellites and widespread sharing of information on the internet.

These considerations offer some hope that Beijing might be open to dialogue on nuclear transparency, monitoring, and verification measures akin to those the U.S. and Russia have long accepted.

For example, merging the separate U.S.-Russian and Russian-Chinese agreements to notify each other of long-range ballistic missile launches and expanding the concept to include all members of the P5 might be a good place to start building confidence and setting a useful precedent.

Likewise, P5 joint verification experiments or mock inspections might increase understanding of the modalities and value of measures to increase nuclear openness and predictability. Similar activities in other contexts, such as the Intermediate-range Nuclear Forces and Conventional Armed Forces in Europe Treaties, have helped international participants gain experience and work together. The inclusion of all five countries might bolster a sense of inclusion and fairness as well as help lay groundwork for cooperation on more challenging issues, eventually including verifiable agreements to limit nuclear arms.

Overcoming China's reticence to engage in nuclear-related talks will likely take deft diplomacy, time, and patience. Washington may need to weigh the importance of China's cooperation in nuclear arms control with other U.S. goals. The issue of participating in five-way nuclear negotiations could also require debate and consensus-building within France and the U.K.

In the meantime, the threat posed by Russian nuclear forces remains. Extension of the 2010 New START Treaty does not require Senate ratification, only presidential approval. Failure to take such a simple and prudent step could be a mistake of epic proportions.

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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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