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## Feature Report

***“Agroterrorism: National Defense Assessment, Strategies, and Capabilities”***. Published by Center for Strategic Deterrence Studies

<https://www.airuniversity.af.edu/CSDS/Display/Article/2327627/agroterrorism-national-defense-assessment-strategies-and-capabilities/>

The USAF CSDS, in partnership with Auburn University, collected a selection of academic studies on the challenges of agroterrorism to the United States. These chapters include discussions on the historical threat and contemporary challenges, U.S. policies and capabilities, and recommendations on how to improve U.S. policies and capabilities for the future.

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# NUCLEAR WEAPONS AND DETERRENCE

Defense News (Washington, D.C.)

## **China Plans to Double Nuclear Arsenal**

By Joe Gould

Sept. 2, 2020

WASHINGTON — China plans to double its stockpile of nuclear warheads in the next decade, including those designed to be carried atop ballistic missiles that can reach the United States, the Pentagon said in a report released Tuesday.

Even with such increases, China's nuclear force would be far smaller than that of the United States, which has an estimated 3,800 warheads in active status and others in reserve. China's nuclear warhead stockpile is estimated to be in the low 200s.

In its annual "China Military Power" report to Congress, the Pentagon said the modernization and expansion of China's nuclear forces is part of a broader effort by Beijing to develop a more assertive position on the world stage and to match or surpass America by 2049 as the dominant power in the Asia-Pacific region.

Deputy Assistant Secretary of Defense for China Chad Sbragia said at an American Enterprise Institute event Tuesday that the People's Liberation Army, or PLA, is "not intended to be merely a showpiece of Chinese modernity" but a tool of Chinese statecraft.

"The Communist Party has spent the last several years completely tearing out and rewiring the PLA organizationally with the goal of transforming into a joint force that is more combat ready, innovative and global," Sbragia added.

On the nuclear side, China is developing a nuclear air-launched ballistic missile and revealed the H-6N as its first nuclear-capable bomber that can be refueled midair. China is also moving toward a more ready "launch-on-warning" posture for its missiles with an expanded silo-based force, the Pentagon report said.

The report noted that the number of warheads on China's land-based intercontinental ballistic missiles capable of threatening the U.S. is expected to grow to roughly 200 in the next five years. China's ICBM arsenal consists of 100 missiles with various ranges, the report said.

The analysis comes as the U.S. is in nuclear talks with Russia ahead of the expiration of the New START nuclear pact. A key sticking point is the U.S. demand to include China in any new agreement, even as China has repeatedly refused.

Separately this week, Defense Secretary Mark Esper suggested likeminded nations in the Pacific — India, Australia and Japan — could form a NATO-like alliance, whose apparent aim would be to deter China. This week, Esper was wrapping up his trip to Hawaii, Palau and Guam, where he has met with senior leaders from across the region

Pentagon officials on the trip also highlighted internal discussion to redistribute U.S. forces concentrated in South Korea and Japan to Guam and points farther south.

"Maybe the future is going to be less about bases and more about places — being able to operate across a multiplicity of locations, which give us the flexibility and the agility to respond to a variety of different threats and challenges," David Helvey, who is performing the duties of assistant secretary of defense for Indo-Pacific affairs, told reporters.

China, the report noted, has increased its defense budget, and surpassed the U.S. with a ground-launched missiles in larger numbers with greater ranges than the U.S., and in shipbuilding. The People's Liberation Army Navy has a battle force of more than 350 ships and submarines, in comparison with the U.S. Navy's 293 ships.

Sbragia noted that China's ability to project power in the region and beyond has advanced dramatically in recent years.

China's global ambitions have, the report stated, likely led it to consider Thailand, Singapore, Indonesia, Pakistan, Sri Lanka, the United Arab Emirates, Kenya, Seychelles, Tanzania, Angola and Tajikistan as potential locations for PLA military logistics facilities.

"I don't think they've reached final conclusions on any of those yet," Sbragia said. "But their aspirations are not small, and they're not limited to a single geographic location. This is global in scale."

The Associated Press contributed to this report.

<https://www.defensenews.com/congress/2020/09/01/china-planning-to-double-nuclear-arsenal-pentagon-says/>

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Military.com

## **Air Force's New Top General Is Calling for Radical Change to How the Service Fights**

By Oriana Pawlyk

Aug. 31, 2020

In his first strategic message to the Air Force, Chief of Staff Gen. Charles "CQ" Brown is pushing for radical changes, saying the service must rethink its internal structure to better align with how airmen deploy around the world, and ditch unnecessary or aging equipment that can't give airmen the advantage on the battlefield.

In his paper, "Accelerate Change or Lose," distributed to airmen Monday, Brown said the window of opportunity to adapt to a changing battlefield continues to shrink, which is why airmen need to address challenges -- from the coronavirus pandemic to emerging threats from a resurgent Russia or China -- head on.

"If we don't change -- if we fail to adapt -- we risk losing the certainty with which we have defended our national interests for decades," Brown said. "We risk losing a high-end fight. We risk losing quality Airmen, our credibility, and our ability to secure our future."

"It's an opportunity to give us some options and some flexibility to be adaptive, and to accelerate changes," Brown added during a phone call with reporters Monday.

"You want to train like you're going to fight, and from that aspect, [we've got] to take a look at ourselves ... and figure out what may be the best model that provides a level of readiness relative to direct force and how we are organized at home station," he said.

Some recent Air Force efforts have embraced this idea, Brown said. For example, the service in 2017 introduced the "deployed teaming" concepts, or to dispatch airmen who previously deployed on individual taskings as part of teams of three or more.



Like aircraft platforms that now face retirement, programs that are "broken," aging, or that don't offer a competitive edge against near-peer aggressors, must also be reevaluated, Brown said.

Specifically, "Programs that once held promise, but are no longer affordable or will not deliver needed capabilities on competition-relevant timelines, must be divested or terminated," he said in the paper. The recommendation follows moves by the Army and Marine Corps to ditch some legacy systems to pay for capabilities designed for a future high-end war.

During the phone call, Brown did not offer examples of what those programs may be, but said the service is assessing where it can take risks as it moves forward.

"We must be able to account for the interactive nature of competition and continuously assess ourselves relative to our adversaries' adaptations," he said. "Capabilities must be conceived, developed, and fielded inside competitors' fielding timelines -- knowing we will need to adapt and adjust over time.

"Likely future budget pressures will require the most difficult force structure decisions in generations. We cannot shy away from these decisions," he said, adding the service must be fiscally responsible of taxpayer dollars.

### Outpacing the China Threat

Brown most recently led Pacific Air Forces, where he oversaw more than 46,000 airmen operating out of Japan, Korea, Hawaii, Alaska and Guam. The job afforded him a chance to closely observe China's military buildup on contested islands within the South China Sea. He also led the air campaign against the Islamic State as head of Air Forces Central Command.

In his paper, Brown emphasized that a "good enough today" mentality will not prevail in a future fight with an adversary, particularly on those, like China, that have developed their capabilities while the U.S. focused on counterinsurgency missions in the Middle East.

"We must be prepared to address our competitors' attempts to hold the U.S. Homeland at risk with unconventional, conventional, and even nuclear force," Brown said. "As a Service, decisions on our missions and capabilities must be informed by how they fare against our understanding of competitors' theories of victory, ways of war, and force development strategies."

Brown focused on China as a rapidly changing threat aiming to eclipse America's standing on the global stage. As the PACAF commander, Brown last year said the Air Force should pursue different avenues, such as evasive or deceptive measures, to stifle competitors including China, instead of always relying on its most expensive weapons as a deterrent.

Brown in his document that these tactics are especially vital in an "environment that includes, but is not limited to, declining resources, aggressive global competitors, and rapid technology development and diffusion."

Therefore, "the U.S. Air Force must accelerate change to control and exploit the air domain, while also underwriting national security through nuclear deterrence to the standard the nation expects and requires."

### Long Road Ahead

Like his predecessor, now-retired Gen. David Goldfein, Brown described the task at hand as a "journey," one that should leverage partnerships with sister services like the newly created Space Force, partners and allies, and industry.

"I can't do this alone; the aspect of this is, we are in competition in our national security and it doesn't end after my tenure or for several chiefs of staff after me. And so we're going to be thinking about this on a regular basis," he said during the call.

Like Goldfein, Brown said the service must rely on those in the ranks, empowering them to make decisions and preparing them for more expeditionary deployments. The future environment will require multi-capable airmen with fundamental skills who react nimbly in fast-paced situations and who "demonstrate value in the diversity of thought, ingenuity, and initiative," he said.

As a whole, the service "has got to move faster," Brown said Monday.

"We got to move at the pace, at least the same pace that our adversaries are moving -- and so that's why we've got to adjust ... and be willing to change and ready to change in the same way," he said.

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<https://www.military.com/daily-news/2020/08/31/air-forces-new-top-general-calling-radical-change-how-service-fights.html>

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## US COUNTER-WMD

Military.com

### **The Next Major Battlefield Threat Facing US Troops May Be Undetectable**

By Matthew Cox

Sept. 2, 2020

As the world contends with the COVID-19 pandemic, civilian and U.S. military experts alike are voicing worries that combat units are ill-equipped to detect powerful new bioweapons that are likely to become a reality on the future battlefield.

Since the pandemic struck, the active-duty military has fared far better than the general population, thanks in significant part to its youthful population. While Defense Department-connected coronavirus cases have now surpassed 50,000, only six U.S. troops have died from the disease.

Nonetheless, COVID-19 has illustrated the ability of a biological threat to sideline military assets and cripple readiness. Early in the pandemic, the aircraft carrier Theodore Roosevelt had to pause deployed activities to contend with a massive outbreak that infected about 1,200 sailors; elsewhere, many combat training rotations were put on hold as units isolated for months to prevent spread of the disease.

The military has learned to adapt with new safety protocols, and operations are returning to a new normal. But experts say that COVID-19 was only a wakeup call: a harbinger for the next new threat that may not be a naturally occurring pandemic, but a sophisticated bioweapon that troops may not be able to detect or deter until it's too late.

Over the past decade, the joint force has focused its attention on the threat of cyberattacks from countries like Russia and China that can devastate communications, GPS and other battlefield tech. But the military's ability to operate on a chemical-biological battlefield is still calibrated for the last war, when the chemical weapons threat was the predominant focus.

"I am a lot more afraid of the biological threat than I am of the chemical threat," Dr. Peter Emanuel, senior research scientist for bioengineering at Army's Combat Capabilities Development Command's Chemical Biological Center, told Military.com. As the executive agent for the Defense Department, the Army is responsible for overseeing chemical and biological warfare defense programs for the services.

"My job is to make sure that the U.S. warfighter is safe on the battlefield that is contested. ... When I am faced with a chemical threat, I have a lot of tools in my toolbox to give to the senior leaders," Emanuel said. "But when I am faced with a biological threat, I have very few."

A new age of biological weapons is now far more likely with recent advances in synthetic biology, a scientific revolution that could be a Pandora's Box that gives rise to deadly new strains of pathogens that are easily duplicated, scientists say.

The Pentagon is playing a significant role in Operation Warp Speed, a massive effort by government and private organizations that involves synthetic biology to develop and deliver 300 million doses of a COVID-19 vaccine by January 2021.

"That's how a vaccine is being made; we are using synthetic biology, purposely engineered biology to make the vaccine that is going to save the world," said Emanuel, the Army's lead for synthetic biology. But he worries that "super weapons" can emerge as easily as life-saving cures, he said.

"The same technology that is going to save you with a vaccine when Operation Warp Speed is complete," Emanuel said, "is the same technology that can create the next threat."

And there are very few short-term solutions to countering this new threat that can be accelerated with more money from Congress, experts maintain. Despite the warnings, there is little evidence that the Army has launched any initiatives to assess its readiness for the future bio threat.

#### Warnings Before COVID-19

The last time warnings emerged of U.S. adversaries possessing deadly biological and chemical weapons was in the lead-up to the 2003 invasion of Iraq, but fears that then-Iraqi leader Saddam Hussein would release weapons of mass destruction were based on faulty intelligence.

To prepare for such an attack, soldiers and Marines crossed into Iraq wearing chemical-biological protective suits known as Mission Oriented Protective Posture (MOPP) gear. U.S. combat units, believing the threat was real, inoculated troops against known pathogens such as smallpox and anthrax. Experts say that troops were likely more prepared then because they were dealing with known threats.

When COVID-19 hit nearly two decades later, it educated the world about how effective a global pandemic can be at creating an atmosphere of terror and helplessness while wreaking economic havoc.

The threat landscape is shifting as it becomes more likely that synthetic biology will allow scientists to alter pathogens such as anthrax, making them more resistant to traditional vaccinations and detection, experts say.

Scientists have been warning that natural pathogens distributed through trade and transportation are only a few of the perils that go along with this new biological revolution.

"Bioweapons have been with us a long time, but because of the revolution in biology that is going on, we have the capacity to make new, more powerful bioweapons that could evade all of our capacity to diagnose them and to treat them," Tara O'Toole, executive vice president of the not-for-profit scientific investment organization In-Q-Tel, testified at a November 2019 hearing before the Senate Armed Services Committee's subcommittee on emerging threats and capabilities.



"And it is very unlikely, given the difficulty of gathering intel on these programs, that we will have advance tactical knowledge of what weapon we might be facing or even where it might come from," she added.

O'Toole, the former undersecretary of Homeland Security for Science and Technology from 2009 to 2013, told lawmakers that the threat of new bioweapons and bioterror exists because of the advances that have been made in the life sciences in the past 40 years, which are now more accessible across the Internet.

"More and more people are going to have access to this technology as it becomes a foundational technology of the 21st century economy," according to the transcript of O'Toole's testimony.

Emanuel calls this the "democratization of science," meaning that the "first time you do something in science, it's very difficult, and then it becomes substantially easier as people have seen how you can do it."

In synthetic biology, scientists are applying the principles of engineering to biology to turn bacteria microbes into biomanufacturing, he said.

"As biotechnology becomes more mature and synthetic biology becomes the new thing, the democratization of biology now presents us with a conundrum -- Pandora's Box is open," Emanuel said. "I think that one of the concerns that has been bounced around ... is now that people have seen the power of biology to seize control of the global economy; does that make biology a more attractive weapon? Could the people that are intent on ill purpose suddenly rethink their ill-will to employ this technology? And that is a pretty scary thought."

From 2009 to 2019, the Government Accountability Office identified challenges in America's ability to detect and respond to biological events, highlighting vulnerabilities in biodetection technologies, biological laboratory safety and security, and emerging infectious disease surveillance, according to a June 2019 report.

In September 2018, the White House released the National Biodefense Strategy, which established a Biodefense Steering Committee including agencies such as the Defense Department, Department of Homeland Security, State Department and the Environmental Protection Agency.

But Dan Gerstein, a former Army officer and senior researcher at Rand Corp., says the U.S. is nowhere near ready to deal with future biological threats.

"I testified about a year and a half ago in front of the National Commission on Biodefense, and I followed a group of government guys. And the government guys were all happy to talk about how we coordinate and we share information and this and that," Gerstein, a former acting under secretary at DHS, told Military.com.

"I was the next one up, and I looked at the group and said, 'I hate to say this, but I'm like the turd in the punchbowl,' and I sort of laid into it. We are not ready. We don't have vaccines, we don't have protocols, we don't have [effective] biosurveillance."

**Biodetection: the U.S. Military's Weak Link**

Unlike a natural virus such as COVID-19, an effective biological weapon would cause exposed individuals to start showing signs of infection in hours, not weeks, said Gerstein, who holds a Ph.D in biodefense.

"If you had a properly prepared biological weapon -- think about a state-sponsored weapon -- it wouldn't act like a normal disease," he said. "You would have massive numbers of people who have received an overwhelming dose and ... you would actually see disease, in some cases, occur in hours."

When Gerstein was a signal brigade commander in the early 2000s, chemical-biological warfare training was always more focused on chemical weapons.

"The sensors are actually pretty good for chemical, and if you emplace them according to doctrine, you should get a warning," he said. "The problem with biological is, we are just not very good at detecting it, and so we have always worried."

One of the main bio-detection systems in the U.S. military's inventory is the Joint Biological Point Detection System, which is a box about the size of a dishwasher that fits inside combat vehicles like the Stryker Nuclear, Biological and Chemical Reconnaissance Vehicle.

It's designed to provide early warning and identification of aerosolized biological warfare agents. But the system is only somewhat effective against known agents, Thomas Spoehr, a retired Army lieutenant general and director of Heritage Foundation's Center for National Defense, told Military.com.

"They detect only a set number of biological agents; they detect anthrax, because that is a very powerful biological weapon, and they detect plague and some others," said Spoehr, who is a former commandant of the Army's Chemical, Biological, Radiological and Nuclear (CBRN) School at Fort Leonard Wood, Missouri.

"If somebody was to engineer something new that your [system] wasn't set up to detect, you wouldn't get a positive reading," he said.

So a new bioweapon could be created if an adversary, such as a state-sponsored terrorist group, had the scientific technical support to engineer a synthetic new strain of a deadly virus, Gerstein said.

"You have to be able to know what you are targeting and, with biology, you get strains that change ... and that causes problems; it's much more difficult than it is for, say, a chemical warfare agent," he said. "One strain of anthrax will be found by the detector; another strain may not.

"A guy in a cave is not going to be able to do this now," he added. "What about state-sponsored bio-terrorists -- probably very easy."

The main weakness of current biodetection technology is that it has very little standoff capability, Emanuel said.

"For chemical detection, I can actually detect chemicals with discrimination at distance," he said. "That means that I don't have to walk right up to a chemical and touch it in order to be like, 'That is going to kill me.'

Current biodetection is tied to wet chemistry, or analysis of substances in the liquid phase, Emanuel said.

"The difference between a bacteria that is just going to live in your mouth and going to be fine ... and anthrax or plague or a virus like AIDS or COVID-19, is really just a couple of clicks of a molecule, and so it's very difficult for me to differentiate or discriminate a good bio from a bad bio," he said. "The state of technology is, you are linked to wet chemistry. I have to go over and stick a swab down your throat and then put it in a little tube and then run a machine. The further away I get [from] touching a bacteria or a virus, the less fidelity I get. From across the room, forget it."

Congressional language in the House Appropriations Committee's fiscal 2021 defense appropriations bill shows lawmakers expressing encouragement for the Defense Threat Reduction Agency's (DTRA) effort to develop a prototype sensor providing real-time detection of aerosolized biological threat agents.

In reality, DTRA's prototype is still in the very early stages of development, Emanuel said.

"If the detector proves effective, it will take many years before it is validated, produced and fielded to the U.S. military," he explained. "The reality is that we are limited in what current equipment is capable of performing."

Military.com asked the Army if the service is taking any steps to assess and possibly improve its biological agent detection capabilities based on threats emerging in the post-COVID-19 world, and was referred to the Defense Department.

Spoehr believes that the Pentagon has its hands full dealing with the massive response to the pandemic.

"I think in terms of the DoD's response to this, they have adapted on the fly," Spoehr said. "In terms of long-term response, it's too early. My guess is they are taking the posture of, 'Hey, let's get through this and then we will do an after-action report and figure out whether we need to change anything.'"

"Nothing long-term has changed yet; I suspect it's going to change ... but we may not see that for months."

Another concern among experts is what will happen once America moves beyond the hold of COVID-19.

Julie Gerberding, co-chair of the Commission on Strengthening America's Health Security at the Center for Strategic and International Studies, touched on the problem when she testified, along with O'Toole, at the November 2019 Senate Armed Services hearing.

"When biothreats are recognized, policymakers do allocate emergency resources, but ... once the crisis fades and public attention subsides, urgency morphs into complacency, investments dry up, attentions shift and a false sense of security takes hold," she said in the transcript of the hearing.

It's not just about money, Emanuel said.

"You can't just throw money at this particular problem; it's a combination of three things," he said. "It's a combination of guided intent, money ... and science making some specific advances on fundamental problems."

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<https://www.military.com/daily-news/2020/09/02/covid-19-may-force-pentagon-pay-attention-major-weak-spot-bioweapons.html>

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Honolulu Civil Beat (Honolulu, Hawaii)

## **Will Hawaii's \$1.9 Billion Missile Radar System Get Built?**

By Kevin Knodell

Aug. 31, 2020

When the Pentagon announced in February that it was defunding the \$1.9 billion Homeland Defense Radar-Hawaii, local activists celebrated it as a victory. But in June, the Senate Armed Services Committee added a full funding provision as it made its markup for the Fiscal Year 2021 National Defense Authorization Act.

James Rodrigues, a local activist with the group Malama Makua, said he felt blindsided when he learned the radar's funding had been restored. He accused Hawaii's congressional delegation of resurrecting a dead project.

"We participated in the community meetings, submitted testimony and stopped the radar," he said.

The Pentagon zeroed out funding after challenges finding a location led to significant delays and cost increases and drafted a report to look at alternative options. Critics have argued the project would harm the environment and cultural sites — and might not even effectively protect Hawaii from modern missile threats.

One of the sites for the proposed radar is at Kaena Point near Makua Valley. Members of the local organization Malama Makua oppose the construction of the radar.

But while the project has come up against fierce opposition from local activists, it also has strong supporters. As tourism dwindles amid the pandemic, the state is desperately looking for ways to put people to work. Both the construction and operation of the radar offer lucrative opportunities for local contractors.

Sen. Mazie Hirono, who called the radar her "top priority in the NDAA this year," said that while the Trump administration had cut funds for the radar, the project never stopped "as far as the people who actually pay attention to missile defense" were concerned.

### Location Setbacks

Hirono said that the 2018 missile false alarm in Hawaii underscored how exposed many residents feel when it comes to missile threats.

That missile scare happened during a time of heightened tension between the United States and North Korea as President Donald Trump and North Korean leader Kim Jong Un sparred on Twitter over nuclear weapons. Trump has since met with Kim and lavished praise on the leader, but tensions on the Korean Peninsula remain high.

The Missile Defense Agency awarded Lockheed Martin a contract for \$585 million in December 2018 to develop, build and deliver the radar with work being done in New Jersey and Hawaii. But the facility itself is going to be considerably more expensive. In 2019, the estimated cost was about \$1 billion. Officials are now referring to it as a \$1.9 billion project.

Agency spokeswoman Heather Cavaliere said the price increased during the siting process as planners evaluated the likely challenges of building the radar over rugged terrain, as well as the logistics of moving supplies and contractors.

The MDA conducted an initial siting study that evaluated 46 sites on Oahu and Kauai. The agency settled on three sites along Oahu's North Shore for inclusion in the environmental impact statement

process. Two were at the Army's Kahuku training area, but one was struck from the list due to likely logistical problems and high costs.

The third was the Kuaokala Ridge near the U.S. Air Force Kaena Point Satellite Tracking Station. Rodrigues said that he and fellow activists did a tour of the site and found a heiau, a traditional Hawaiian temple.

Rodrigues also noted that the nearby Makua Valley is home to over 40 endangered species. More than 80% of the endangered species on Oahu can be found on land controlled by the military.

In October, the MDA began revisiting the possibility of placing the radar at the Navy's Pacific Missile Range Facility on Kauai's west side. But in December, Defense Secretary Mark Esper ordered the MDA to postpone the program.

He directed planners to conduct a study of a range of sensor options, including the HDR-H, that could be placed around the Pacific for missile detection. Cavaliere said the final version of that report was delivered to Esper in May.

When Hirono grilled Esper about funding during congressional testimony in March he told members of the Senate Armed Services Committee that defunding the project didn't necessarily mean it was canceled, but that "if I develop a system and can't put it somewhere, it has no effect. It's wasted money."

Without the radar, Hawaii depends on the mobile SBX radar — a program that has been controversial — and other ship-based radars for missile detection.

"The whole missile defense saga has been a long, drawn-out and expensive one," said Dan Grazier, a veteran and military researcher at the Project on Government Oversight. "Any of these programs should warrant scrutiny."

### Filling The Gap

Hirono said that U.S. technology has to evolve in response to North Korea's pursuits. She said that country is "quite single-minded about their pursuit of long range missiles and their technology I'm sure is evolving."

And then there's China, which has increasingly clashed with the U.S. and its neighbors in the South China Sea. China has worked to develop new hypersonic missiles designed to go through American missile defense systems as it seeks to widen its influence in the Pacific.

"We don't get to choose the threats we face," said Tom Karako, director of the Missile Defense Project at the Center for Strategic and International Studies. "All those threats are not distant — they're real and very possible."

But those opposed to the radar argue that these new technologies make the HDR-H obsolete before it's even built, and that the military is already looking to space-based missile sensor systems that would quickly replace it.

The military readily admits that the radar won't be able to detect the latest hypersonic missiles.

"As a matter of U.S. policy, our homeland missile defenses are not designed to defeat the large and sophisticated Russian and Chinese strategic missile arsenals," Cavaliere said, but added that the HDR-H fits into a broader defense system.

While space likely is the future, Karako said, the present missile defense system has limitations.

"It's all about the problem you're trying to solve," he said of the utility of the Hawaii radar. "If that problem is stopping a North Korean ICBM, then that's what it's for."



## Lockheed Martin

Karako noted North Korea's missiles aren't believed to have hypersonic capabilities like the latest Chinese and Russian models — at least not yet — and that the HDR-H should be perfectly capable of detecting them and “fills the gap” until new space systems are ready.

Evaluating the value of the radar comes down to weighing “resources, time and risk,” he said. Space-based systems are likely still three to five years out, he added, but the Pentagon doesn't seem to believe the HDR-H itself will be completed for at least three years either.

Rodrigues argued that essentially means the military would be building a radar that would quickly become redundant on lands that Native Hawaiians hold as sacred. “We're so militarized here on Oahu we take for granted all we've lost,” he said.

## Longterm Commitment

Lockheed will likely subcontract a significant portion of the \$1.9 billion to local companies for excavation, construction, electrical work, plumbing, site security and other tasks.

“That's a lot of money, a lot of jobs,” said Jason Chung, vice president of the Hawaii Military Affairs Council. “Then there is the manning, service and maintenance component, which goes beyond the \$1.9 billion build cost.”

Chung said that would mean long term jobs for cybersecurity specialists, engineers and others. “The defense industry is helping Hawaii to grow jobs in the STEM field,” he said, adding that “can offer high-paying jobs and the opportunity to remain home in the islands.”

Some local activists have pledged to disrupt construction of the project and said they're willing to get arrested. Hirono said that she understands that there continues to be local opposition but insists critics will get the chance to speak.

“There will be public input, and there will be a process that will be followed,” she said. “But I certainly wanted to keep this on track.”

Grazier said that when Congress pays for projects in increments as they are being built and developed — a process called “concurrency” — it can turn them into projects that become “too big to fail” after money has already been spent.

Grazier said he is skeptical of military programs that are touted for their economic value and require constant upgrades. “Those are red flags that I look for,” he said.

Hirono said defense dollars play a large role in Hawaii's economy, but bristles at the idea that the HDR-H is for anything other than keeping Hawaii safe. As geopolitical tensions escalate across the Pacific, Hirono said Hawaii needs the radar.

“I think we need space sensors, but I think we also need sensors that are closer to Earth,” Hirono said. “So it's not one or the other.”

<https://www.civilbeat.org/2020/08/will-hawaiis-1-9-billion-missile-radar-system-get-built/>

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# US ARMS CONTROL

Defense News (Washington, D.C.)

## **Ball's in Russia's Court on New START Extension, Says DoD Official**

By Joe Gould

Sept. 2, 2020

WASHINGTON — The United States and Russia have shown a willingness to extend the New START nuclear pact before it expires next year, but the ball is now in Russia's court, a Pentagon official said Wednesday.

New START, which limits each country to no more than 1,550 deployed nuclear warheads and 700 deployed missiles and bombers, expires Feb. 5 unless the two sides agree to extend it for five years. The 2010 pact is the last remaining bilateral nuclear arms control agreement between the Cold War adversaries.

U.S. representatives, in recent talks with Russia in Vienna, said Washington would consider an extension if there were a new framework to include Russia's range of unconstrained nonstrategic nuclear weapons and the implementation of stronger verification measures, as well as the inclusion of China in future talks. The U.S. team offered Moscow proposals to that effect.

"Now we're waiting to see if Russia has the political will now to come and talk to us about it," Robert Soofer, deputy assistant secretary of defense for policy for nuclear and missile defense, said during an Air Force Association event on Wednesday.

At the crux of the impasse: Russia supports an unconditional extension but says it will not agree to changing New START. China, whose nuclear arsenal is dwarfed by that of the U.S., has said it has no interest in joining the negotiation, and Russia has also refused to force China to the table.

Russia has said if China is included, France and the U.K. — which have nuclear arsenals in the hundreds — must also join.

On Wednesday, Soofer did not rule out five-way talks, though it's unclear whether that reflects the position of U.S. negotiators.

"I won't speak for allies, but you may eventually see a much larger multilateral approach as opposed to just the three-way approach that we, we think about it right now," Soofer said.

On Tuesday, the Pentagon reported that China likely seeks to double its stockpile of nuclear warheads in the next decade as part of its global ambitions. China is also moving toward a more ready "launch-on-warning" posture for its missiles with an expanded silo-based force, raising questions about its "no-first-use" policy.

Soofer, who doesn't believe China would maintain such a policy in extreme circumstances, argued that the move by Beijing was yet another reason to get it to the negotiating table. China, meanwhile, is closing the gap with Russian and U.S. nuclear capabilities, he said.

"At the end of the day, they may be worse off by increasing the size of their nuclear forces, if this precipitates a response or an increase by the U.S. and Russia," Soofer said. "And so the approach right now is: Let's talk."

Aside from the geopolitics, there are Washington politics too. Though Soofer offered a lengthy defense for current U.S. nuclear modernization efforts, he said the cost will eventually double from

3.5 percent of defense spending and spark fights involving Congress and the Defense Department. (An exit from New START may cost even more.)

“This is going to put a lot of pressure on the services, no doubt,” Soofer said. “On Capitol Hill, as the numbers go up, there’s more of an opportunity for those who take a more simple approach to deterrence to argue, ‘Well, we can’t afford this.’”

Still, modernizing America’s nuclear triad has support in the White House, and to a good degree in Congress, evidenced by the House and Senate passing defense policy bills this year that fully fund each leg.

Soofer speculated that even if President Donald Trump’s rival, Joe Biden, were elected, support would remain “solid” for the triad, the F-35 Joint Strike Fighter and the Long Range Standoff Weapon, which is a nuclear-capable, air-launched cruise missile.

“I don’t foresee [internal debate over the nuclear triad] occurring under a Trump administration over the next four years, but if there were to be a new administration, depending on who is appointed in a position of authority to make these decisions, you may have these types of discussions,” Soofer said.

A Biden administration, he said, would likely host arguments over a no-first-use policy and whether to proceed with a nascent nuclear-armed, submarine-launched cruise missile, which is meant to deter Russia from using its tactical nuclear weapons. (Biden reportedly advocated for a no-first-use policy as vice president and on the campaign trail.)

After surviving a debate in Congress earlier this year, the Air Force’s Ground Based Strategic Deterrent program is on track for an award by the end of September, Soofer said. The program has avoided pandemic-related delays that have stricken other military efforts.

Northrop Grumman is expected to win an estimated \$85 billion to design and build the missile — after Boeing declined to move forward following Northrop’s acquisition of solid-fuel rocket motor-maker Orbital ATK.

GBSD is set to replace the Minuteman III intercontinental ballistic missiles in the mid-2020s. The Pentagon’s top acquisition official, Ellen Lord, has said there is “no margin” to do another service life extension for the Minuteman III, which was fielded in the 1960s and has gone through only minimal upgrades over its 50 years of use.

<https://www.defensenews.com/congress/2020/09/02/balls-in-russias-court-on-new-start-extension-says-dod-official/>

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38 North (Washington, D.C.)

## **Two Hands Are Better Than One**

By Leon V. Sigal

Sept. 2, 2020

Book Review: Kim Jong Un and the Bomb: Survival and Deterrence in North Korea

Kim Jong Un and the Bomb: Survival and Deterrence in North Korea

By Ankit Panda. Oxford University Press, 2020. 416 pp.

Tiring of being told “on the one hand...on the other hand,” US President Harry Truman once expressed his wish for a one-handed economist. A similar wish would be fulfilled by many strategic analysts in Washington today. Ankit Panda, a Stanton Senior Fellow at the Carnegie Endowment for International Peace, exemplifies that one-handedness in his new book, *Kim Jong Un and the Bomb*.

Panda’s analysis is unequivocal: Ever since the Korean War, the Kim dynasty has been determined to develop nuclear weapons and the intercontinental ballistic missiles (ICBMs) to deliver them against the United States and never intends to give them up. The North needs them to ensure the regime’s survival by deterring any attempt to attack or subvert it.

Panda’s assessment, widely shared around Washington, is plausible enough, but it ignores the counterevidence and airbrushes all the ambiguities out of the picture. Why did Pyongyang stop reprocessing plutonium in 1991—before it had any nuclear weapons—and not resume extracting nuclear fuel until 2003? Why in 1994 did it agree to verifiably shut down its functioning Yongbyon reactor and scrap two larger reactors then under construction in return for two less proliferation-prone reactors—reactors that would make it dependent for their operation on cooperation with the United States for years?[1] Why did it again disable its nuclear facilities at Yongbyon in 2008 even though its uranium enrichment efforts were not yet operational? Why did Kim Jong Un unilaterally halt tests of nuclear weapons and longer-range missiles in 2018—stopping short of demonstrating a proven miniaturized thermonuclear device and an ICBM to deliver it—and has yet to resume them? Without addressing such questions, how can anyone be so sure what Kim Jong Un wants?

Yet Panda makes no effort to address them. He pays only cursory attention to the details of negotiations between Pyongyang and Washington prior to the Trump administration, then provides a sketchy version of Trump’s nuclear diplomacy, all to underscore Kim’s unwillingness to disarm.[2] In an echo of John Bolton, he disparages the value of dismantling the Yongbyon reactor as “not the prize it might once have been” (276), ignoring the dismantlement of other plutonium, tritium, and highly enriched uranium (HEU) facilities at Yongbyon under discussion in the run-up to Hanoi. He claims, for instance, “The talks process ended in February 2019 in Hanoi with a North Korea walk-out and no deal” (22). It was Trump, of course, who abruptly departed.

Through it all, Panda misses the North’s emphasis on reaching a fundamental accommodation with the United States. He ignores the possibility that the DPRK wanted to hedge against China’s rise as well as reduce its political and economic security and dependence on Beijing by seeking an end to US enmity, and thereby an end to the US nuclear threat.

Nor does Panda ask how nuclear arming will deal with the regime’s economic insecurity. Instead, he implies that self-reliance would suffice, quoting Kim’s reaffirmation of economic orthodoxy after the Hanoi Summit failed to yield sanctions relief, commanding the party to “vigorously advance socialist construction by dint of self-supporting national economy.”[3] Panda notes slackening enforcement of sanctions by China and Russia and adds, “For now, it seemed, the regime could

breathe easy—even if its people would continue to tighten their belts” (283). So much for regime survival.

Panda is much better at examining the details of the North’s weapons development. He has mined intelligence assessments and interviewed officials to come up with a primer on the North’s nuclear and missile history. Although he uncritically accepts what may be quantitative overestimates of its weapons, he does raise occasional doubts. For instance, he acknowledges that many of its missiles may not be indigenous but imported from Russia and modified with components from abroad and considerable tinkering in the North. Panda repeatedly asserts that the North has an ICBM “that has the ability to strike anywhere on the continental United States of America with a thermonuclear warhead” (2). Yet a rocket capable of reaching the lower 48 states is not an ICBM unless it has a flight-tested reentry vehicle, which he eventually acknowledges it does not yet possess.

He also lays out a sophisticated interpretation of what North Korea’s strategy of deterrence might be. To deter the buildup of an American expeditionary force, as deployed in the war against Iraq, Panda writes, “North Korea would have to convey a willingness to introduce nuclear weapons early and before any actual use of force against it by the United States and its allies.” But to “go first and go big” would have “terrifying consequences”: for Kim “to contemplate first use” would necessitate a “total crisis.” Panda imagines Kim’s calculus:

Even if my missiles are not destroyed [by Stealth fighters], enhanced American cyber and electronic warfare might sever me from my ability to command my nuclear forces. So I should ready my short-, medium-, and intermediate range ballistic missiles, mate them with nuclear warheads, and prioritize valuable targets (83).

While targeting Andersen Air Force Base on Guam, US headquarters at Yokosuka and the Terminal High Altitude Area Defense (THAAD) battery in Seongju County, South Korea, Kim would hold his ICBMs in reserve in hopes of deterring nuclear retaliation.

Panda recognizes the dangerous implications of this strategy for instability in an intense crisis. He also appreciates the limitations of US intelligence to pinpoint the location of all the mobile missiles in the North, which would be essential for a preemptive attack, as well as the shortcomings of US missile defenses. He fears that coexistence with a nuclear-armed North Korea may gradually erode South Korean and Japanese trust in the reliability of US deterrence, leading them to acquire nuclear forces of their own.

These considerations lead Panda to call for arms control negotiations with the DPRK to ease the perils of nuclear coexistence. Yet his one-handedness now traps him in a series of contradictions. “An arms control approach to North Korea need not cast aside the longer-term goal of total disarmament,” he concludes, which “has a vanishingly small probability of ever materializing” (303). That calls into question his repeated assertion that this goal is certainly unattainable. He embraces “a three-step cap-reduce-eliminate formula” (306):

The first objective might be to limit the production and supply of nuclear weapons fuel and warheads; from there, the focus might shift to limiting Kim’s expansive array of delivery systems for these bombs; then the United States could seize the remaining window in which indigenous launch and reentry technology is still developmental (307).

He ends with an astounding claim, “Make no mistake: such an approach would restructure nearly three decades of U.S. policy toward Pyongyang from the ground up” (306). A closer reading of the negotiating history would have avoided such an inaccuracy.

What’s in this for Kim Jong Un? The one-handed approach leaves Panda no rationale for Kim to acquiesce. Panda sees sanctions relief as a sufficient inducement for the first objective. That ignores the North’s longstanding desire for a fundamental change in what it calls the “US hostile policy,”



which would start with a scaling down of joint exercises, a peace process in Korea beginning with an end-of-war declaration and ending with a formal treaty, and full diplomatic relations, perhaps with an exchange of liaison offices as a first step.

There is much merit in Panda's work but he could use another hand.

[1]

Christopher Lawrence, "Normalization by Other Means—Technological Infrastructure and Political Commitment in the North Korean Nuclear Crisis," *International Security* 45, no.1 (Summer 2020): 1-50.

[2]

For a different perspective, Leon V. Sigal, "Paved with Good Intentions: Trump's Nuclear Diplomacy with North Korea," *Journal for Peace and Nuclear Disarmament*, 3, no.1 (April 21, 2020): 163-182.

[3]

"Report on 4th Plenary Meeting of 7th Central Committee of WPK," KCNA, April 11, 2019.

<https://www.38north.org/2020/09/lsigal090220/>

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BBC (London, U.K.)

## **Iran Nuclear Deal: Why US 'Snapback' Sanctions on Iran Could Fail**

By Marc Weller

Sept. 1, 2020

Even before he was elected, President Donald Trump called the Iran nuclear settlement of 2015 "the worst deal ever".

The US pulled out of the complex arrangement in May 2018 and has now attempted to trigger a "snapback" - or re-imposition - of comprehensive UN sanctions against Iran that would scupper the entire deal.

Why does the deal matter?

The nuclear deal is the result of complex negotiations led by the US over many months. In essence, it requires Tehran permanently to renounce the development of nuclear arms, along with an acceptance of verification by the International Atomic Energy Agency (IAEA).

In return, the UN Security Council removed all previous sanctions on Iran. Instead, it imposed a fresh set of more limited sanctions. These would expire automatically in three stages, in parallel with Iranian compliance.

The first tranche of Security Council sanctions concerning conventional arms transfers is set to expire in a few weeks' time.

Restrictions on ballistic missiles are to run until 2023, with the remaining limits on nuclear transfers becoming obsolete 10 years after the conclusion of the deal, in 2025, subject to IAEA safeguards.

Why do the limits on Iran's uranium enrichment matter?

How did it all start?

When Washington withdrew from the deal, it pointed to Iranian attempts to destabilise its region, in particular in Lebanon, the Palestinian territories, Syria and Yemen. The US also alleged Iran was pursuing a nuclear programme likely to jeopardise the global non-proliferation regime.

The US re-imposed its own comprehensive set of sanctions unilaterally and started to threaten companies of third states with punitive measures unless they, too, complied.

Iran asserted this was a material breach of the deal. However, rather than ceasing participation in return, it continued compliance and claims to have invoked its dispute settlement procedure.

After a year of supposed fruitless settlement attempts, in 2019 Iran started a process of "reduced compliance" in answer to the US action. In particular it has enhanced its uranium production in excess of the permitted limits.

There were also Iranian tests of "space vehicles" which many consider disguised test launches of nuclear-capable ballistic missiles, along with violations of the restrictions on conventional arms transfers, in particular in relation to the Yemen conflict.

How did the other participants respond?

The deal was concluded between Iran and six states - the US, UK, France, Germany, Russia and China - with the EU supporting implementation.

EU states have tried to offset the losses caused for Iran by the US sanctions, in an effort to keep Tehran interested in compliance with its part of the bargain.

However, in January the European states in turn invoked the dispute settlement mechanism in view of Iran's by then seriously reduced compliance. China and Russia have sided with Iran, arguing that the US unilateral withdrawal is a material breach of the arrangement.

What is the legal status of the nuclear deal?

It was concluded as a political arrangement - and most agree that it is not in itself a treaty governed by international law. This was due to Iran's concerns about its own sovereignty, given the explicit and permanent renunciation of nuclear weapons.

Moreover, the Obama administration would not have been able to conclude a binding treaty, given the difficulties of Senate ratification.

The deal is not without legal effect, however. The principle of good faith requires states not to act against their own commitments, even if not strictly legally binding in the first instance. Moreover, the deal was endorsed by UN Security Council Resolution 2231, with reference to Article 25 of the Charter, which obliges states to comply with Council decisions.

The provisions concerning the lifting and imposition of sanctions were adopted expressly under the mandatory enforcement provisions of Chapter VII of the UN Charter.

What is the snapback?

International law provides for binding agreements, but is weak on their enforcement. In this case, this defect was cunningly turned on its head. While being unable to conclude a binding treaty, the US insisted on a very powerful enforcement mechanism of the undertakings of Iran, whether strictly binding or not.

The difficulty was that once the comprehensive sanctions were lifted, a fresh decision in the Security Council to impose new ones, in case of Iranian non-compliance, would have been required.

The same would have been needed in order to extend the sanctions imposed under resolution 2231 beyond their respective sunset clauses.

The US was aware, after the controversy over a so-called "second resolution" concerning Iraq before the US invasion of 2003, that other states might veto such a step. Hence, the US sought to reverse this power imbalance through the snapback provision.

Uranium enrichment process chart

Transparent line

How does the snapback work?

After invoking the dispute settlement mechanism, a "participant state" in the deal can allege an instance of "significant non-performance" by Iran. After 30 days, such a claim will result in the automatic re-imposition of all UN sanctions as they existed before the deal became operative, unless the Council adopts a resolution that would suspend that effect.

If no individual Council member proposes such a suspensive resolution within 10 days, the Council President must put one forward. The US could easily veto such a draft and the full set of sanctions would automatically "snap back", effectively terminating the nuclear deal with Iran.

How far has the process gone?

In early August the US put forward a resolution that would have simply extended the arms embargo provided for in the deal indefinitely, instead of expiring this autumn. This step in itself suggests that the US may have had hesitations relating to its snapback argument.

However, that proposal was overwhelmingly defeated in a Council vote. Last week, US Secretary of State Mike Pompeo formally invoked the snapback procedure.

How has the Security Council responded?

The other participants in the deal immediately wrote to the Council president, stating that the US had withdrawn from it and could thus not rely on the snapback procedure. This view was supported by virtually all other members of the Council, other than the Dominican Republic, which has reflected the US position throughout.

The Council president then said that, given the large majority of views expressed in this sense, he did not feel in a position to take further action on the US application.

What are the positions of the sides?

The US and Iran have both submitted extensive legal arguments in favour of their respective positions.

The US argues that it has not violated the deal as it is not legally binding. Moreover, paragraph 10 of Security Council Resolution 2231 names the US as a "participant state". According to Washington, that definition is independent of actual participation in the underlying arrangement.

Hence the US retains formal participant status even after having ceased to participate. Accordingly, Washington can invoke the snapback process reserved for "participant states", as the obligations contained in the deal, and the snapback provision in the Security Council resolution, are claimed to be entirely separate.

On the other hand, all the other states involved assert that the US cannot rely on the snapback, because it has withdrawn from the deal and is no longer a "participant" - you cannot eat your cake and have it too, as the Russian UN ambassador put it.

Who is right?

When withdrawing from the deal, President Trump expressly decided to end "the participation of the United States" in the arrangement. This unhappy phrasing, repeated by Secretary of State Pompeo, makes it difficult to argue that the US remains a participant only for the purposes of the snapback.

John Bolton himself, National Security Advisor at the time of the withdrawal, asserts that this view is "legally incorrect", as do all the other participant states and the EU.

The finding of the Security Council president, undoubtedly based on legal advice, also points in that direction. Moreover, the admittedly ingenious US attempt to isolate the definition of "participant state" from the question of which states are actually participating in the deal does not work.

Clearly the deal and the snapback mechanism contained in Resolution 2231 are interrelated - the latter only exists to enforce the former.

That connection is also confirmed by the fact that, according to the underlying deal which must inform the interpretation of Resolution 2231, states wishing to invoke the snapback must first try the dispute settlement procedure that is part of the deal. That procedure is only available to states actually participating.

Hence, the US has excluded itself from the snapback mechanism. That result is in line with the logic of the relevant provisions: the snapback was designed to ensure the integrity of the arrangement, not as a tool to unhinge and destroy it.

Could the US have avoided this result?

Ironically, if the US had played by the rules negotiated by the Obama administration, it could have achieved its aims. Instead of withdrawing as a participant state in 2018, it could have alleged serious non-compliance and engaged in the required dispute settlement attempts. These having remained unsatisfactory for the US, it could then have triggered the snapback, while still being unquestionably a "participant state".

Afterwards the US could have resigned from the deal, leaving the comprehensive Security Council sanctions in place indefinitely. When seen from this perspective, John Bolton's verdict that the US administration is acting "foolishly" is difficult to dismiss out of hand.

What happens next?

It has been suggested by a former UN assistant secretary-general for legal affairs that the Council might simply refuse to accept the snapback proposal onto its agenda.

More likely, the Security Council may simply ignore the invocation of the snapback, arguing that Washington no longer has the standing of a participant state.

That, however, leaves the real concern about Iranian "reduced" compliance, which is now turning more critical, unaddressed. If no diplomatic solution is found over the next few months, the entire deal will remain in jeopardy, snapback or no snapback.

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<https://www.bbc.com/news/world-middle-east-53984818?xtor=AL-72-%5Bpartner%5D-%5Bmicrosoft%5D-%5Bheadline%5D-%5Bnews%5D-%5Bbizdev%5D-%5Bisapi%5D>

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# COMMENTARY

Middlebury Institute (Monterey, Calif.)

## **The CTBT and the 2020 NPT Review Cycle**

By Sarah Bidgood

Aug. 31, 2020

The following is an excerpt from the CTBTO Spectrum

When the Comprehensive Nuclear-Test-Ban Treaty (CTBT) was concluded in 1996, US President Bill Clinton called it the “longest sought, hardest fought prize in arms control history.” This characterization proved both more prescient—and more premature—than he could have imagined at the time. While 168 countries have ratified the CTBT as of February 2020, eight of the 44 states that must do so in order for it to enter into force have not. This situation has remained unchanged since 2012, when Indonesia became the 36th Annex 2 State to become a party to the Treaty.

In spite of these circumstances, the CTBT has played a crucial role in the development of a robust global norm against nuclear testing in the nearly 24 years since its conclusion. One unintended consequence of this outcome, however, is the current lack of urgency surrounding the Treaty’s entry into force. In part because a return to widespread nuclear testing has seemed so unlikely in recent years, efforts to persuade the eight remaining Annex 2 states to pursue ratification have been unsuccessful. As a result, the CTBT is neither legally binding or enforceable today, a situation that places the non-proliferation community at a significant disadvantage.

This is especially the case today, given that the international security situation is both more dangerous than it was a year ago and rapidly deteriorating. The traditional arms control architecture is eroding, and the norm against nuclear testing could potentially follow suit. Faced with the challenges posed by North Korea’s nuclear weapons program, the unraveling of the Joint Comprehensive Plan of Action (JCPOA), and a return to arms racing, practitioners and experts should consider how the CTBT can help address the world’s most pressing nuclear threats. Reaffirming the Treaty’s contributions to the non-proliferation regime would be an important first step toward reinvigorating support for its entry into force today.

The upcoming 2020 Review Conference of Treaty on the Non-Proliferation of Nuclear Weapons (NPT) could constitute a target of opportunity for this endeavor. Here, States Parties will have the chance to underscore the CTBT’s relevance to new and longstanding challenges while highlighting its mutually reinforcing relationship with the NPT. They could do so in an especially compelling way when it comes to addressing North Korea’s nuclear weapons program. If North Korea signed and ratified the CTBT, this would provide a legally binding assurance that Kim Jong Un planned to uphold the nuclear test moratorium he unilaterally declared in April 2018. Proposals to this effect were included in the 2018 NPT Chair’s Factual Summary and the 2019 Chair’s working paper, both of which urged the DPRK to sign and ratify the CTBT. Delegates should revisit this language as they look for practical recommendations that could attract widespread support when they meet in New York later this year.

<https://www.nonproliferation.org/the-ctbt-and-the-2020-npt-review-cycle/>

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Breaking Defense (Washington, D.C.)

## **Lessons for the Pacific from The European Deterrence Initiative**

By Bradley Bowman and Maj. Scott Adamson

Aug. 28, 2020

In the last week, China has fired an array of missiles near the Paracel Islands, clearly intended to shape the attitudes and actions of the United States and our fellow Pacific friends and allies. The U.S. Commerce Department has slapped sanctions on two dozen companies involved in China's illegal destruction of Pacific coral reefs as it builds military bases on them. China says it doesn't need to recognize international law — accepted by every other country on earth — because it doesn't think it had enough influence in shaping it. What must be done to ensure China is a responsible international actor, one its neighbors don't need to need fear? Congress thinks the Indo-Pacific Deterrence Initiative will help. What should the Pentagon do? Read on! The Editor.

Benjamin Franklin famously wrote, “an ounce of prevention is worth a pound of cure.” While Franklin was certainly not thinking of national security policy, the United States would be wise to apply the principle to deterring aggression from Beijing.

Leaders of the Senate and House Armed Services Committees appear poised to do just that by establishing a Pacific Deterrence Initiative (PDI) in the forthcoming fiscal year 2021 National Defense Authorization Act (NDAA).

The Pentagon should consider lessons from a similar effort in Europe, sparked when the U.S. failed to apply Franklin's principle before Russia's 2014 invasion of Ukraine and illegal annexation of Crimea. Distracted elsewhere and confused regarding Putin's intensions, Washington allowed the military deterrence of Moscow in eastern Europe to atrophy. Putin saw his opportunity and sprang into action.

Following Moscow's aggression in Crimea and fighting in eastern Ukraine, the United States belatedly created the European Reassurance Initiative, later called the European Deterrence Initiative (EDI). According to testimony in February from Gen. Tod Wolters, the commander of U.S. and NATO forces in Europe, EDI has increased “forward-stationed and rotational forces,” funded exercises and training, built partner capacity, and improved prepositioned stocks and vital military infrastructure.

EDI, Wolters says, has been “critical to our deterrence and posture successes.”

That is exactly what the United States must do without delay in the Indo-Pacific.

Some in the Pentagon are concerned that a PDI might reduce the Department of Defense's flexibility, but it is past time to substantively align U.S. budgets and programs with rhetoric regarding the importance of the Pacific. As Rep. Mac Thornberry, ranking member of the House Armed Services Committee, has said: “It is time to put our money where our mouth is.”

To do that effectively in the Pacific, three lessons from Europe are particularly instructive. The first is: waste no time in getting started. Before Moscow's aggression in Ukraine, Washington dithered and ignored warning signs. Russia's 2008 invasion and occupation of large portions of Georgia, as well as subsequent military reforms, should have set off alarms.

The United States must not make the same mistake when it comes to the Chinese Communist Party's activities in the Indo-Pacific.

The warning signs regarding the CCP are already manifest in Hong Kong, along the border with India, in the South China Sea, and in the seas and skies surrounding Taiwan. The top U.S. military

officer in the Indo-Pacific has warned that the U.S. military balance of power with China continues to become “more unfavorable.”

Washington should not wait for Beijing to invade Taiwan or attack U.S. vessels in the South China Sea to get ready.

Washington also should not delay because building the kind of deterrence referenced by General Wolters takes time. Finite budgets and industry capacity contribute to protracted timelines when procuring necessary stocks of pre-positioned equipment.

Similarly, the need for defense cooperation agreement negotiations, host nation approvals, and contractor capacity extends the duration required to build necessary infrastructure. In the case of the EDI, only a handful of the more than 70 authorized EDI military construction projects have been completed since the program began in 2015. These frequent delays are exacerbated when military construction funds are diverted to other projects.

There is no reason to believe that PDI won't take years as well. Washington should not expect that it can reverse decades of neglect in the Indo-Pacific with one or two annual appropriations.

That brings us to EDI's second lesson for a similar effort in the Pacific.

Congress has authorized and funded EDI using the Overseas Contingency Operations (OCO) account. OCO was originally intended to fund short-term expenses associated with post-9/11 conflicts. But the continued use of OCO for major multi-year initiatives represents a ploy to bypass budget limits associated with the base budget. This approach comes at a cost in terms of program predictability, prioritization, and assessment.

Largely stemming from OCO's one-year term, versus the base budget's five-year outlook, the abridged planning cycle curbs valuable program oversight performed by Congress, undercuts messaging to allies and adversaries, and hinders the Pentagon's ability to measure progress as part of the regular planning, programming, budgeting, and execution (PPBE) process.

Admittedly, funding the PDI through the base budget will require Congress to actually establish priorities and pursue bipartisan consensus. That is exactly what is required to ensure the PDI's long-term success.

A third lesson learned from EDI is the importance of investing in less glamorous but vital capabilities, those related to infrastructure and logistics. To deter additional Russian aggression in eastern Europe, the U.S. has used EDI to invest in airfields and other infrastructure necessary to transport and support combat forces. In his February testimony, Wolters suggested those critical investments have been essential in building credible U.S. deterrence.

That is exactly what the U.S. and its partners in the Indo-Pacific need to do to deter and defeat Beijing's aggression. A recent report by Indo-Pacific Command emphasizes the role of infrastructure in “distributing forward-deployed forces across the breadth and depth of the battle space.” That will require investment in the first and second island chains to facilitate the survival, mobility, dispersal, and lethality of U.S. forces.

High profile weapons systems built in the districts and states of well-positioned members of Congress will always get the political support they need. But the PDI is crucial because it will ensure that the vital supporting infrastructure required in the Pacific also has the needed political support.

As Washington moves to create a PDI, there is much to learn from the experience in Europe. If Washington applies those lessons appropriately, Americans can finally reap the benefits of Franklin's sage advice.

Bradley Bowman is senior director for the Center on Military and Political Power at the Foundation for Defense of Democracies, where Maj. Scott Adamson is a visiting military analyst. Views expressed or implied in this commentary are solely those of the authors and do not necessarily represent the views of the U.S. Air Force or any other U.S. government agency.

<https://breakingdefense.com/2020/08/lessons-for-the-pacific-from-the-european-deterrence-initiative/>

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European Leadership Network (London, U.K.)

## **How Emerging Technologies Impact the Future of Nuclear Risk and Arms Control**

By Madeline Zutt and Michel Onderco

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Last month marked the 75th anniversary of the U.S. nuclear bombing of the Japanese cities of Hiroshima and Nagasaki. Decades later, the world is still grappling with the presence of nuclear weapons and their associated risks. Although nuclear weapons have not been used in conflict for decades, the risk of their use persists. Around the world, countries are still building and modernizing nuclear arsenals. U.S. President Trump in a recent interview with Axios, argued that nuclear weapons are “in terms of the real world” “a much bigger problem than global warming”. Rapid advances in cyberspace and emerging technologies such as artificial intelligence (AI) and hypersonic weapons compound the risks of close calls, mishaps and misunderstandings in the nuclear domain.

Why we should worry about these technologies

Advances in both AI and cyber pose significant threats to the command and control networks responsible for the deployment of nuclear weapons. An effort to jam a network could, for instance, be interpreted as an indication of an impending nuclear attack. Making nuclear early warning systems and decision-making more automatic also brings risks. Human beings can make ethical judgments and question orders from superiors in a way machines cannot. Moreover, no technology is immune to failure. In the nuclear field where the stakes are incredibly high these failures can be particularly catastrophic.

Of the new technologies, hypersonic weapons are particularly problematic for the nuclear realm. These new weapons, which can deliver conventional or nuclear payloads, differ from intercontinental ballistic missiles (ICBMs). Their speed and manoeuvrability enable them to have unpredictable flight paths, which can evade traditional missile defence systems. A target thousands of miles away can be hit in a matter of minutes, severely shortening the time for the target country to decide its response. This new class of weapons received significant attention in 2019 when Russian President Vladimir Putin announced that Russia had deployed its own hypersonic glide vehicle known as the Avangard. Russia, China and the United States are rushing to develop their own hypersonic capabilities in what many are calling a new “arms race”. While the United States has expressed its desire to have a fully operational hypersonic weapon by 2022, both China and Russia appear to be ahead.

What our research tells us

As researchers at Erasmus University Rotterdam, we recently surveyed 400 security experts from around the world as part of a larger research project funded by the Dutch Ministry of Foreign Affairs that tries to ascertain how experts view the impact of emerging technologies on nuclear

deterrence and nuclear disarmament. The experts ranked hypersonic weapons as the most impactful disruptive technologies in the nuclear realm, followed by cyber.

Experts see the main risk associated with hypersonic weapons to be their severe shortening of the time within which a targeted party will receive, interpret and respond to a warning. While this finding is not revolutionary, it underscores how experts in the nuclear field view the impact of this type of weapon. The hypersonic missile's ability to carry both nuclear and conventional warheads adds to its disruptive potential, as misunderstandings are easy to imagine. A missile with a conventional warhead could easily be assumed to be one with a nuclear warhead. This ambiguity, together with the hypersonic weapon's high speed, could provide strong incentives for countries to develop dangerous nuclear postures or even to attack preemptively for fear that it will be struck with a nuclear warhead.

Experts who cited cyber as the most disruptive technology in the nuclear field saw that cyber technologies can have a number of destabilizing effects on nuclear deterrence. In particular, they noted that, given the increased entanglement of nuclear and non-nuclear capabilities, it is easy to imagine that cyber interference of dual-use early warning systems could lead a conventional conflict to escalate unintentionally to a nuclear crisis.

#### Why we need to change the way we think about arms control

The dangers of these emerging technologies do not necessarily come from the intrinsic properties of the technologies themselves but rather from the applications of these technologies in the nuclear realm. Since these technological advances are happening against the backdrop of crumbling arms control agreements, and increasingly dangerous rhetoric from bellicose leaders, reducing nuclear risk is again urgent. Risk reduction today will have to address the threats posed by new technologies.

Regulating a technology such as hypersonic missiles is comparatively more straightforward because it can be done using traditional arms control tools. These include quantifying, tracking and checking items, where verification is conceptually easier and more straightforward. When it comes to hypersonic weapons in the nuclear realm, the question is "only" about finding the political will to engage in arms control.

Cyber risks appear less amenable to the traditional approach to arms control that has dominated the post-Cold War period. Quantifying and controlling capabilities cannot be simply and neatly exported to the cyber realm (or to artificial intelligence). Moreover, given the decentralized nature of cyberspace and the multiplicity and diversity of actors, security challenges in cyberspace will most likely not be amenable to traditional state-centric arms control measures that have been in place for much of the twentieth century.

One cannot quantify or track intangible cyber activities the same way one can count and limit tangible nuclear hardware like missiles. For this reason, we're going to need a profound cultural shift in the way we think about "arms control" measures, especially if we wish to bring emerging tech into NPT discussions. Future arms control measures are going to have to be less about regulating capabilities and more about placing restrictions on certain types of behaviour. While formal arms control measures can be adapted to include new technologies (like hypersonic glide vehicles), informal arms control measures are probably best suited to deal with enabling dual-use technologies like cyber and AI (including their impact in the nuclear realm). These more informal arrangements should, for example, include multi-stakeholder discussions and agreements on the acceptable parameters of AI or cyber use within the nuclear realm. The OSCE's confidence-building measures that aim to limit conflict caused by cyber technologies could serve as a useful example. Finding a way to scale regional efforts like this one up to the international level will prove crucial.

None of this will be quick, and it certainly will not be easy. However, if we want to be able to respond effectively to the new class of threats emerging technologies pose to the nuclear field, we have to start thinking more creatively about arms control.

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Bulletin of the Atomic Scientists (Chicago, Illinois)

### **A Call for Antiracist Action and Accountability in the US Nuclear Community**

By Katlyn M. Turner, Lauren J. Borja, Denia Djokić, Madicken Munk, Aditi Verma

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The recent depraved killings of George Floyd, Breonna Taylor, Ahmaud Arbery, and Rayshard Brooks ignited widespread protests across the United States, representing a renewed outrage at centuries of white supremacy, colonialism, and state-sanctioned oppression of and brutality against Black people. While not new, this sweeping public outcry and swelling national movement has catapulted conversations about systemic racism into mainstream awareness with an exceptional sense of urgency.

As part of the ensuing national racial reckoning, institutions within the US nuclear community—academic departments, think tanks, advocacy groups, national laboratories, and others—have issued statements condemning systemic racism. (Several institutions within the nuclear community, at the time of writing this article, had still not produced a statement.) But the nuclear community must go beyond acknowledgement alone if it genuinely aims to dismantle long-standing structural inequalities. For these institutions, the true work of becoming antiracist still lies ahead: accepting and rectifying their own complicity in the problem.

A commitment to dismantling systemic racism and becoming antiracist requires openness, willingness to listen and change, and, above all, accountability—on an individual, organizational, epistemological, and institutional level. However, the nuclear community may find it difficult to hold its own institutions and community accountable for systemic racism.

Recent conversations around racism in the field are often limited to security policy and strategy or the militarization of the police force. These discussions illustrate that many are able to critique injustice outside of their own institutions, but miss the more fundamental problem hiding in plain sight in the nuclear community: that its history, logics, and culture “produce or sustain racial hierarchy,” which, by scholar Ibram X. Kendi's definition, means it is racist.



Accountability starts with understanding how systemic racism in the nuclear field is produced and sustained in two different, yet entangled ways. Epistemic racism concerns itself with how the field was built, normalizing colonialist dehumanization, erasure, and exploitation of people of color. Institutional racism, by contrast, involves the mechanisms within the nuclear community that even today create and sustain barriers precluding Black and non-Black professionals of color from full participation, inclusion, and professional advancement. Only by deeply understanding how these traditions of injustice came to be, persist, and thrive within the nuclear community today can its members commit to being antiracists.

Epistemic racism in the nuclear field, from past to present. In the early-to-mid twentieth century, colonialism was thriving globally—and even widely regarded as beneficial to the people of the Global South. In the United States, the “separate but equal” doctrine was widely accepted on the left and right of the political spectrum, and Jim Crow cast a reign of terror and trauma over Black Americans. Ideas about a supposed biological hierarchy of different races and ethnicities were not seen as controversial. Additionally, assimilationism—the idea that a dominant set of cultural and behavioral norms (namely, the norms of the white, Western, and Christian colonial powers) were the “correct” ones to live by, that minorities should strive to assimilate to these norms in order to be granted full participation and citizenship in society, and that those intentionally deviating from those norms were a punishable threat to social order—was accepted, encouraged, and legal.

At the time of its inception, the nuclear field was not immune to these racist and colonial ideas; rather, such norms, politics, and attitudes were ingrained from the outset within its research practices, policies, legal frameworks, and culture. For example, the Manhattan Project—the largest united scientific undertaking of its time—created many of its production facilities by displacing vulnerable minority communities, often without compensation. Many such US nuclear facilities, particularly those for the weapons program, were built without consent on indigenous land, displacing or poisoning those who lived in the vicinity.

Racist policies and attitudes remained entrenched in the US nuclear weapons enterprise as it built, tested, and ultimately used nuclear weapons. The women who worked on uranium enrichment at what would become Oak Ridge National Lab were forced to keep the color line: Black women who were employed at the Y-12 National Security Complex lived in racially segregated facilities, and generally had lower paying jobs at the facility than whites. During the Trinity test, the United States detonated the world’s first weapon of mass destruction on land bordering the Mescalero Apache Reservation in New Mexico. The language and rhetoric around the nuclear detonations at Hiroshima and Nagasaki in Japan were steeped in racist and dehumanizing ideas about Japanese people and culture. These racist ideas were difficult to disentangle from the military threat of Japan as an enemy of the United States and the West and became entrenched in the institutionalized but false narrative that nuclear weapons helped win World War II.

After World War II, as the United States and other nations moved to expand their nuclear weapons capabilities and started to use nuclear technology for electricity production, colonial and racist policies continued to frame the field. Nuclear weapons relied on uranium mined from countries such as Congo, Niger, South Africa, Gabon, Madagascar, and Namibia. Nations with a thriving nuclear energy industry and weapons program such as France continually contested the “nuclearity”—the degree to which a country’s activities count as being nuclear—of these countries to justify denying them economic benefits or occupational protections in exchange for mined uranium. As a result, the health and environmental costs of uranium mining were excluded from calculations on the cost of nuclear power, and workers did not receive protections against radiological hazards.



To date, although nuclear weapons have only been used once in a hot war, weapons were detonated with abandon in colonial (or former) territories of the United States, United Kingdom, France, Russia, and China in the name of nuclear weapons testing. While these testing sites were considered “remote” by European and American standards, they were not at all so to the predominantly Indigenous and people of color living in the Pacific Islands, Algeria, and Australia. Even judging by the norms of the time, the actions of the nuclear-armed nations were dismissive of and dehumanizing to people of color around the world.

When the capabilities of nuclear technology expanded to include commercial electricity production, the majority of the countries that reaped the benefits of nuclear energy were in the Global North. While the ostensible goal of Eisenhower’s Atoms for Peace program launched in 1953 was to share and spread the benefits of nuclear technology globally, it was also to control its distribution. The program sought to supply nuclear technologies to developing nations and police their use in order to prevent nations from developing their own indigenous nuclear technology and the capability to build nuclear weapons. Eisenhower’s promise to help developing countries use nuclear energy for peaceful purposes therefore served as a premise for the United States to purposely structure the subsequent nuclear governing bodies, in particular the International Atomic Energy Agency and later treaties and conventions, to uphold its preferred global order, which was advantageous to Western nations.

Perhaps the most lasting legacy of global colonialist attitudes in the nuclear field is the policy and discourse surrounding the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The nonproliferation regime of the NPT privileges “order” and security for the Western countries over justice, while leaving little space for considerations of race. The very notion of nuclear weapon and non-weapon states, and some of the language deployed to characterize this divide, perpetuates Western hegemony and dominance over the Global South. The existing nonproliferation regime lends credence and legitimacy to colonial attitudes about nuclear technology by legitimizing the possession of nuclear weapons by the United States, United Kingdom, France, Russia, and China while controlling the possession of both weapon and energy technology by other countries through a complex and intrusive international framework of safeguards and technology control. The NPT further gives nuclear weapon states a “big stick” over non-nuclear weapon states to lend legitimacy to military actions such as regime change against them. Finally, while the NPT calls for the weapon states to pursue “general and complete disarmament,” no nuclear weapon state has meaningfully complied with its treaty obligations to disarm—with the result that it indefinitely preserves an inequitable and unjust world order. (Despite early significant reductions in global nuclear warheads, progress has stalled and the rhetoric and policies of recent years have pointed toward nuclear modernization and arsenal expansion rather than disarmament.) Not only did the nonproliferation regime create an unjust and inequitable world order, it did so on the basis of a deeply flawed premise that proliferation could be prevented through supply-side technology controls.

The nuclear weapon states often minimize nuclear security causes championed by members of the Global South. At the 1955 Bandung Conference, representatives from 29 Asian and African countries called for disarmament and an end to the nuclear arms race, fully 15 years before the NPT came into effect. After France’s first nuclear test in 1960, widespread protests across the African continent condemned nuclear weapons testing in Algeria. Despite the outcry, the French government continued nuclear weapons testing at its Centre Saharien d’Expérimentations Militaires until 1966. To this day, France has not adequately compensated Algerian victims for the radioactive legacy of these tests. When South Africa’s apartheid government began to fray in the 1980s, it and the United States feared that its Western-aided nuclear program would fall into the hands of local liberation movements headed by African National Congress leaders. These fears

played an important role in the apartheid government's decision to unilaterally dismantle its weapons program and sign the NPT.

Most recently and notably, the United States dismissed and pressured its allies into dismissing the Treaty on the Prohibition of Nuclear Weapons, whose negotiation was presided over by Costa Rican Ambassador to the United Nations Elayne Whyte Gómez. Many established voices in the US nuclear community echoed the claim that the ban treaty would undermine the nuclear nonproliferation regime, despite the fact that it is fully in line with states' NPT commitments to disarm. Additionally, the International Campaign to Abolish Nuclear Weapons received the 2017 Nobel Peace Prize for its "groundbreaking efforts" to establish the treaty, signaling the treaty's gravity and importance and the statement it makes about peace and nuclear weapons. The minimization and delegitimization of the treaty's early success—82 parties have signed on to date, all but five from the Global South—is part of a historic pattern of dismissing the united efforts and voices on nuclear policy from the Global South.

In the United States, the imprint of the norms and values of the dominant class that shaped the field at the dawn of the nuclear age are omnipresent, even though they often go unquestioned and unnoticed. For example, the radiological safety standards used today draw on knowledge produced from deliberately cruel human experiments, mostly carried out on Black, Indigenous, and people of color. The contributions of Black leaders and artists to anti-nuclear movements are often ignored or forgotten. Serious environmental contamination from US military nuclear activities affecting Indigenous communities such as the Yakama Nation near Hanford, Washington—which made plutonium for the bomb dropped on Nagasaki and the entire US nuclear weapons program through 1987—is barely mentioned in a footnote of a Congressional report. During the Cold War, the US Navy recruited Black laborers from the historically Black neighborhood of Bayview-Hunters Point in San Francisco, California to clean the radioactive contamination from its ships that were brought home from nuclear tests in the Pacific Ocean. Black and Indigenous communities in the United States have disproportionately borne the burden of pollution from nuclear fuel cycle facilities such as uranium mines and mills. Yucca Mountain Repository, the nation's primary site for permanent commercial nuclear waste disposal, was chosen without the consent of the indigenous communities that would be affected (or even of the state of Nevada itself). Even when consent is given, a moral hazard persists when economically disadvantaged Indigenous communities are targeted with financial incentives, as in the case of siting a radioactive waste storage site on Goshute tribal land.

While most of the world's commercial nuclear reactors are still situated in the Global North, the nuclear facilities that are found in the Global South are often legacy and waste-bearing facilities. Many position nuclear energy as a necessary technology in meaningfully reducing carbon emissions and mitigating climate change, yet most countries in the Global South—which are projected to disproportionately bear the impact of climate change—do not experience commensurate economic or infrastructural benefits from nuclear energy. The dominant narrative surrounding the future use of nuclear energy in these Global South nations is founded on the purported technological prowess and moral superiority of Western nations, the inevitability of the Global North as a technology supplier to vast potential markets in the Global South, and the industrial and institutional backwardness of the Global South nations. These perspectives are problematic because they undermine the institutional and legal infrastructure of and disregard the locally produced technology development and innovation practices of the Global South. Furthermore, claims that technological fixes will address climate injustices obscure the complex relationship of the nuclear fuel cycle with aspects of race, gender, and socioeconomic status.

Today it is widely accepted that colonialism was and is harmful, that racism is real and wrong, that climate change is real and imminent, and that equity is something policymakers at all levels should strive for. However, these values are not reflected in the nuclear field, obscuring the complicity of

nuclear technology and policies in racial inequity. Rather, the homogeneity in the nuclear community ensures that the way the field is taught, produces research, and makes policy is constricted to a single frame of reference overwhelmingly informed by the experiences and perspectives of a historically dominant class. As a result, not only are certain forms of knowledge that acknowledge the racist history of the field not valued and therefore rarely produced, but, even when produced, they are erased from the intellectual canons of the nuclear community entirely.

Mechanisms of institutional racism in the US nuclear community. Institutional racism in the nuclear community, particularly in the United States, operates through multiple mechanisms that pervade its professional environments. Black as well as non-Black professionals of color face systemic racism in the nuclear community because of deeply established, rigid hierarchies within its institutions.

Gatekeeping mechanisms—official as well as informal—give these institutions control over professional entry and advancement within the field. Academic institutions, for example, are a major pathway for professionals to enter and advance in the nuclear community. As a result, universities wield significant power to limit or enhance the participation of Black, Indigenous, and people of color in the field. In that regard, they continue to perpetuate racial inequity in quantifiable ways. To highlight one metric, Black students receive disproportionately fewer degrees in nuclear fields, and the disparity grows larger at the graduate level. In 2016, Black students received 4.0 percent of bachelor's, 1.6 percent of master's, and 0.6 percent of doctorate degrees in nuclear engineering—percentages that are substantially below those for all science, technology, engineering and math degrees. These indicators significantly trail national population statistics for Black Americans.

Institutional and cultural mechanisms act to push scholars from underrepresented groups out of the academic pipeline. In the United States, nuclear knowledge is produced in predominantly white spaces, where professionals of color must confront racial biases and structural racism daily.

In order to understand the complexities of how white privilege has obscured the full participation of all professionals in the nuclear field, it is important to consider the intersectionality and interlocking interactions of race, gender, and socioeconomic status within these institutions, as it is difficult to untangle these factors in elite and historically exclusive environments such as academia. Racial and gendered microaggressions, such as gaslighting, censoring, and shutting down points of view push Black women in undergraduate departments of science, technology, engineering, and math out of these fields in large numbers. Women in engineering experience persistent marginalization through formal and informal interactions, but are prevented from transforming their experiences of discrimination into critiques of engineering education. As a result, engineering disciplines maintain the façade of meritocracy while turning potential critics into agents of cultural reproduction. Beyond academia, many people of color, especially women of color, face discriminatory cultures that constrain advancement within nuclear professional environments.

Such exclusionary practices have created an atmosphere where the only way to survive within the nuclear community is to conform to the narrow cultural bounds staked out by its demographic makeup. Three historically black universities have undergraduate classes or degree-granting programs in nuclear engineering, and many minority serving institutions partner with the National Nuclear Security Administration to bring awareness to careers in science, technology, engineering, and math at national labs. However, nuclear education at the graduate level occurs primarily at predominantly white institutions. Graduate school admissions decisions at elite institutions are fraught with bias and barriers to entry, with admissions committees relying on metrics that are poor indicators of graduate student success and that exhibit persistent gender and ethnic differences in evaluating candidates.

Beyond graduate school, these institutions also host temporary post-baccalaureate and post-graduate fellowships, which, although deemed prestigious, offer little job security. Pursuing multiple fellowships, which is often required before acquiring a tenure-track professorship or more secure positions outside of academia, requires finding external health insurance or additional funding to bridge appointments. As a result, persistence and survival in the nuclear field is predicated on having a socioeconomic safety net, which is only accessible to those privileged with intergenerational wealth, mainly distributed along racial lines.

Few nuclear engineering departments in the United States have Black tenured or tenure-track faculty members, if any. Black, Hispanic, and Indigenous professionals are underrepresented in research positions at national laboratories, especially in management and leadership roles. Of the 67 past presidents of the American Nuclear Society, only one—J. Ernest Wilkins, Jr.—identified as African American. A recent study found that, since 1970, only five women of color (out of 36 total women) have held leadership positions in the nuclear security policy field within the US government. Furthermore, Black, Hispanic, and Indigenous professionals are grossly underrepresented at recurring technical and policy conferences in the nuclear field. Leaders at organizations often prefer to mentor junior colleagues who are most similar to themselves, which leads to decreasing numbers of women and women of color within the top institutional ranks.

As remedial measures, many campuses have adopted diversity, equity, and inclusion initiatives. These initiatives often ask Black and non-Black professionals of color to perform work that is unpaid, unacknowledged, and often resisted, amounting to an invisible “time tax.” Some diversity efforts at universities target interdisciplinary scholars, proposing positions specifically for faculty with joint appointments split among disparate departments. However, tenure-track faculty with joint appointments tend to encounter conflicting departmental expectations and differing but required academic service and teaching between departments. Faculty of color with joint appointments have also seen unique barriers in tenure review that are not experienced by faculty with appointments in a single department. Without equitable inclusion in these systems, intersectional scholars will continue to face barriers upon entry to these academic spaces.

The exclusion of Black professionals and experiences in the nuclear community creates a privileged bubble that prevents insiders from seeing their field in racial terms. This would not be the first time when those not impacted by discrimination are ignorant to its presence. But this bubble is already obvious to many of the Black and brown professionals in the field:

It’s always struck me, as a person of color, that it’s often brown people and black people that are on the negative receiving end of a lot of our national security policies.... We detonated some of our strongest weapons in Bikini Atoll and in Micronesia and the Marshall Islands. It wasn’t the suburbs of Montana that we were doing that in. Whether it’s criminal justice policy or national security policy, when we talk about who is a valuable life, black and brown people are the last in the line of that list.

Mutually reinforcing, the mechanisms of epistemic and institutional racism in the nuclear field work in concert to erase the scholarship, history, and perspectives of people of color. Consciously or unconsciously, leaders in the nuclear field perpetuate epistemic racism through these institutionally racist practices, reinforcing the field’s narrow logics and paradigms. In that way, these leaders act as gatekeepers of knowledge regarding the racial injustices of the field and impede epistemic diversity. Because of that, future scholars and professionals in the nuclear field may be unaware of how racism and colonialism intertwine with the technologies and policies that they work on, ultimately precluding rectification of racial injustices in the field. Both epistemic injustices and institutional racism must be acknowledged and addressed jointly in earnest to create a truly antiracist future in the nuclear community.

A starting point for accountability and action. Antiracism begins with accountability, honesty, and vulnerability. Many have already leveled similar critiques against the nuclear community. We are not the first to call for changes in the nuclear community after a nationally-recognized incident of police brutality against Black people. We are not the first to call for the nuclear community to shift its focus or expand its definition of expertise in the field. We are not the first to call for a new definition of security to address concerns of people of color. We are not the first to call out the inherent intellectual racism created by exclusively considering a Western imperialist viewpoint or how race is a central but unacknowledged force in politics. We are not the first to criticize hollow statements of solidarity or incremental action on racism. But these injustices continue to be ignored and perpetuated.

We need to not only push for epistemic and institutional transformation within the nuclear field, but also look within our own institutions and personal lives to examine and oust whiteness from its privileged position within the nuclear community. While no single person can change everything, each of us has the power to take antiracist action based on our own unique position, privilege, and influence. For example, only leaders with decision-making power can make changes to admissions, hiring, and promotion structures in nuclear institutions. But individuals at all levels of an organization can commit to “calling in”—as opposed to calling out—their peers when they hear racist ideas or actions being perpetuated.

So what antiracist actions can we take?

It is time for organizations to take on a committed, multi-year prioritization of racial inclusion. One way is to start collecting and publishing data on diversity hiring, retention, and promotion within our organizations. We should, with consent, collect and publish demographic attendance data on recurring events. Numbers are not a panacea—for example, measuring the gender representation and wage gap alone has done little to reduce them. Data are only a starting point for nuclear institutions in identifying the points of failure and countering the mechanisms of how leadership constrains both the activities and professionals it deems unworthy of staying in the field.

To prioritize racial inclusion, we need to consider how policies within our institutions impede the success of a diverse nuclear community. Short-term, low-pay appointments that offer little or no benefits, such as unpaid internships or even post-graduate fellowships, are untenable for professionals without a social and economic safety net, especially for those with dependents. In academia, institutions must ensure that workload and performance are evaluated equitably, especially in the tenure and promotion process. Employers need to consider revisiting job requirements and support structures to allow professionals to develop translational skills for expanding career options—and not penalize them for doing so.

The geographic location of an institution, especially if situated in a historically or predominantly white community, may create additional barriers for nuclear professionals who are Black, Indigenous, or people of color. Institutions should adopt policies, such as flexible hours or telecommuting, that allow employees to fully participate without asking them to live within an unwelcoming or unaffordable community.

Beyond expanding the nuclear community pipeline, our institutions should acknowledge, give space and time to, and fund diverse forms of scholarship. Being antiracist requires actively acknowledging the racist and colonialist epistemologies endemic to the nuclear field. Currently, entrenched biases within the nuclear community lead to the undervaluing of work from the perspective of other fields. Valuable insights on justice and equity can be found in existing scholarship on critical race theory, in science and technology studies, and in postcolonial and feminist studies, to name just a few. Inviting scholars from these fields to give cross-disciplinary talks or workshops in a nuclear institution is another one of the many straightforward measures that can be taken. We should



reshape our institutional policies to explicitly create supportive multidisciplinary spaces for critical studies and training with a focus on the nuclear field.

At the individual level, there are many steps that we can take to be allies to Black and non-Black professionals of color. We must listen and acknowledge the concerns of our colleagues of color in a non-defensive way; educate ourselves on antiracism—without seeking validation for doing so; and take the time to educate peers on antiracism rather than expecting professionals of color to do this work. We must actively create a culture where colleagues of color are safe, welcome, and encouraged to call attention to racism in the workplace.

As mentors, we should provide insight and guidance on the norms and unwritten expectations of the field, amplify the work of people of color, and offer to write them letters of recommendation. We must not dismiss these efforts as activism or as distracting from other forms of work. People with established positions, such as tenured professors, managers, or directors, should be at the forefront of constructing an antiracist culture within their organizations. Last, people at all levels should seek to humanize their colleagues of color instead of finding ways to dismiss them for their responses to racism in the workplace.

The issues laid out here are not exhaustive, nor do they necessarily reflect the realities of all Black or non-Black professionals of color in the US nuclear community. These suggestions are just a starting point for a profound and long-overdue reckoning with the racist and colonialist past and present of the nuclear field. We hope that this serves as a call for meaningful commitment and concrete action toward dismantling systemic racism—both epistemic and institutional—in the US nuclear community.

Lauren J. Borja co-wrote this piece while a fellow at the Center for International Security and Cooperation (CISAC).

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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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