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## Feature Report

***“The Long Arm: How U.S. Law Enforcement Expanded its Extraterritorial Reach to Counter WMD Proliferation Networks”***. By Aaron Arnold and Daniel Salisbury; Published by Managing the Atom Project, Belfer Center; Feb. 2019

<https://www.belfercenter.org/publication/long-arm>

The networks of middlemen and intermediaries involved in the illicit procurement of weapons of mass destruction (WMD)-related goods and technologies often operate outside of the United States, which presents several legal and political challenges regarding U.S. trade control enforcement activities. This report considers the extraterritorial efforts of U.S. law enforcement in counterproliferation-related activities and their implications. In other words, how does the United States contend with violations of its weapons of mass destruction (WMD)-related trade controls in overseas jurisdictions, and what are the implications for broader U.S. and international nonproliferation efforts, as well as wider international security and economic concerns?

In recent decades, North Korea and Iran have demonstrated a keen ability to exploit lax governance and oversight in various countries to illicitly procure WMD-related and dual-use goods and technologies—i.e., goods and technologies that have both WMD and civilian applications—in the international marketplace. Even countries with sophisticated indigenous capabilities, like China, India, and Pakistan, continue to illicitly procure these goods and technologies through black and grey markets. Illicit suppliers and middlemen, for example, have frequently used circuitous routes, acquiring goods through third countries and transshipping them in order to avoid the scrutiny of law enforcement, intelligence, and regulatory agencies. In order to address these gaps, the United States, in concert with international partners, has taken significant steps to ensure states make concrete commitments to implement supply-side controls in order to prevent the spread of WMD-related goods and technologies. The United States has promoted stronger controls on illicit trade through law enforcement and intelligence cooperation, industry outreach, and capacity-building and training efforts. In principle, while other countries face similar challenges with extraterritorial enforcement, the United States has been the most aggressive.

Despite international commitments to implementing national trade controls, significant gaps in financial, supply-chain, and logistical systems remain, mainly due to political and legal differences between foreign jurisdictions. In response, U.S. law enforcement has adopted a wide range of counterproliferation activities to contend with jurisdictional hurdles. Take, for example, the case of Karl Lee—a “principal contributor” to Iran’s ballistic missile program. Karl Lee (aka Li Fang Wei) is a China-based businessman who, since the early 2000s, according to U.S. prosecutors, supplied Iran’s ballistic missile program with advanced technologies and controlled materials, such as graphite, specialty metal alloys, gyroscopes, accelerometers, and various machine tools and manufacturing equipment. Some of the goods, like graphite, appear to have been produced in his factory located in Dalian, China. In 2014, open source records suggested that Lee expanded his manufacturing operations beyond graphite, to include fiber optic gyroscopes—a critical component used in missile guidance systems. The Karl Lee case helps to illustrate a particularly tough problem when it comes to WMD proliferation: jurisdiction. That is, what can the United States do to counter networks and middlemen that traffic in WMD-related goods and technologies who are located in foreign jurisdictions where authorities are unwilling to work with U.S. officials or their allies?

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# NUCLEAR WEAPONS

National Nuclear Security Administration (Washington, D.C.)

## **W76-2 Supports National Security Initiative Requested by the President in the 2018 Nuclear Posture Review**

Author Not Attributed

Feb. 25, 2019

WASHINGTON – The Department of Energy’s National Nuclear Security Administration (DOE/NNSA) successfully completed the First Production Unit (FPU) of the W76-2 warhead Feb. 22 at the Pantex Plant in Amarillo, Texas.

The W76-2 FPU represents NNSA’s ability to achieve a significant program milestone in support of a national security initiative requested by the President in the 2018 Nuclear Posture Review.

“NNSA is fully committed to meeting the requirements of our partners at the Department of Defense,” said Dr. Charles P. Verdon, NNSA’s Deputy Administrator for Defense Programs. “The W76-2 will allow for tailored deterrence in the face of evolving threats.”

The W76-2 program is a modification of the W76-1 warhead to provide a low-yield, sea-launched ballistic missile warhead capability.

NNSA is on track to complete the W76-2 Initial Operational Capability warhead quantity and deliver the units to the U.S Navy by the end of Fiscal Year 2019.

Click here to learn more about NNSA’s mission to maintain the U.S. nuclear weapons stockpile.

<https://www.energy.gov/nnsa/articles/nnsa-completes-first-production-unit-modified-warhead>

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Breaking Defense (Washington, D.C.)

## **Navy’s New Nuke Sub on Track; Early Problems Fixed**

By Paul McLeary

Feb. 26, 2019

CAPITOL HILL The head of the Navy’s Columbia-class nuclear submarine program says that the program, despite earlier concerns over cost, schedule, and industrial base issues, is set to meet its goal of a first deployment in 2031, putting the service’s most expensive and consequential program on track.

The boats will come just in time to replace the fourteen aging Ohio-class ballistic missile submarines, which will be over 40 years old by time they’re replaced, making them the oldest subs the US Navy has ever taken to sea.

All of the Ohios were all commissioned between 1981 and 1997, and the US hasn’t built another SSBN since, leading to some slack in the industrial base.

Rear Adm. John Tammen, who directs the Navy’s Undersea Warfare Division, said today at the Heritage Foundation that “our nuclear industrial base has been somewhat stagnant for awhile,” but



with work starting soon on the Virginia payload modules (which increase cruise missile capacity in attack submarines), “we see the industrial base ramping up pretty quickly here.”

In the coming years, the planned 12 Columbia submarines will be tasked with carrying about 70 percent of the nation’s strategic nuclear weapons capability in their weapons bays, making it possibly the most mobile, and survivable leg of the nuclear triad. But the boats, part of a \$128 billion program to upgrade the nation’s nuclear posture, will enter service at a critical time for the Navy, as it struggles to build more hulls to reach its 355-ship goal while also spending more to refit and repair existing ships to extend their lifespans.

Navy leadership has said that the increase in funding they received over the past two years will have to be sustained to pull this off. Building new Ford-class aircraft carriers, Columbia subs, and brand-new classes of frigates and cruisers — all while bringing the F-35 into the force — will pose a challenge to Navy spending.

The program has very little wiggle room on schedule, as the Ohio subs will have to be retired as soon as the Columbia boats come on line.

Tammen said he’s working with Newport News and Electric Boat to accelerate work schedules on the subs where he can. “You see it in the shipbuilding plans. There are gap years in the Columbia schedule so if we can pull work into those gap years,” the schedules can be sped up.

A scare last year with the subs’ missile tubes threatened to push the timeline back, but Tammen said Tuesday that there is enough slack in the early going that all is well, despite the snafu.

What happened was the Navy’s primary submarine builder, Electric Boat, hired a subcontractor to help with the welding of its missile tubes. After the tubes were delivered some inconsistencies were found in the welding, leading to a halt to the tubes’ installation. The company admitted in November that the faulty work would cost a relatively paltry \$27 million to fix over the course of the next year.

Speaking at the annual Naval Submarine League conference on late last year, George Drakeley, the civilian in charge of the Navy’s submarine programs called the incident a “debacle,” adding that fixing the issue is “is going to be harder than we thought.” The problem also affects the Royal Navy’s new Dreadnought-class submarines, which use the same Common Missile Compartment as the American Columbia. But it appears to have been a relatively easy and cheap problem to fix.

<https://breakingdefense.com/2019/02/navys-new-nuke-sub-on-track-early-problems-fixed/>

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# US COUNTER-WMD

Defense News (Washington, D.C.)

## Raytheon Will Participate in Army Missile Defense Radar ‘Sense-off’

By Jill Aitoro

Feb. 21, 2019

WASHINGTON — Raytheon will participate in a missile defense radar “sense-off” to test designs that could be included in the U.S. Army’s Integrated Air and Missile Defense system under development.

The Army announced plans for the sense-off in October, resetting the approach for the Lower Tier Air and Missile Defense Sensor, or LTAMDS, program that has struggled to bring about a new radar for well over a decade.

The sense-off is “separate and distinct” from contracts awarded to Raytheon and Lockheed Martin last fall to come up with design concepts for a new missile defense radar, according to Bob Kelly, Raytheon’s director for integrated air and missile defense in the company’s Integrated Defense Systems division, who spoke with reporters Thursday.

According to an Oct. 29 notice posted to the Federal Business Opportunities website, the sense-off will take place this spring at White Sands Missile Range, New Mexico. Each vendor with a radar will have roughly two weeks on the range to demonstrate capabilities. A down-select will happen by the end of the year.

“We can meet the timeline for both the sense off and initial operational capability in fiscal year 2022,” Kelly said.

However, it’s unclear what this means for the prior technology development program. Kelly said that effort remains relevant, with the contract ongoing, but referred any further questions about its status to the Army.

“Our developmental efforts — what we do for one, it serves the other as well,” he said. “We were both [Raytheon and Lockheed Martin] going to develop prototypes. But with the sense-off, we’re doing it faster,” and with more competitors.

The sense-off strategy accelerates the timeline by a couple of years, Kelly said.

The other lingering question is whether the LTAMDS will include 360-degree coverage — a high priority for the Army, but seemingly one downsized in importance for the LTAMDS effort.

“The threshold is not for a 360-degree radar,” Kelly said, adding that Raytheon’s base design does include the capability. “We have a lot of scalability in our system, so if the Army decides they don’t want [360-degree coverage], we can give them the opportunity in the future to upgrade.”

The Raytheon-made Patriot air and missile defense radar was first fielded in the 1980s, and the Army attempted to replace the system with Lockheed Martin’s Medium Extended Air Defense System through a co-development effort with Germany and Italy. But that program was canceled in the U.S. after closing out a proof-of-concept phase roughly six years ago.

Since then, the Army has studied and debated how to replace the Patriot radar with one that has 360-degree detection capability, while Raytheon continues to upgrade its radar to keep pace with current threats. It is acknowledged that there will come a point where that radar will not be able to go up against future threats.

“The Patriot remains exceptional” today, Kelly said. “LTAMDS is looking out beyond tomorrow.”

<https://www.defensenews.com/land/2019/02/21/raytheon-will-participate-in-army-missile-defense-sense-off/>

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Homeland Preparedness News (Washington, D.C.)

## **Researchers Update Guidance for First Responders on Treating Chemical Exposure**

By Dave Kovaleski

Feb. 25, 2019

Researchers have developed a new tool and updated guidance to help first responders and emergency managers determine how best to decontaminate a massive number of people after chemical exposure.

The updated guidance on chemical decontamination, called Primary Response Incident Scene Management or PRISM, incorporates new scientific evidence in what it refers to as the “triple protocol” – which involves disrobing and conducting dry decontamination, wet decontamination using the ladder pipe system with high volume/low pressure water deluges from fire trucks, and technical (or specialist) decontamination. The researchers say these three steps remove 99.9 percent of chemical contamination.

“When we began working with the University of Hertfordshire six years ago, our goal was to provide emergency managers and first responders with scientific evidence and guidance they needed to make fundamental and fast decisions on how to save the greatest number of lives in chemical emergencies,” said Biomedical Advanced Research and Development Authority (BARDA) Director Rick Bright. “Building on the first ground-breaking studies and guidance, we now have a larger body of scientific evidence that is incorporated into the latest guidance, and we have made it even easier for responders to use in preparing for disasters and on the scene in an emergency.”

BARDA developed the updated guidance along with the University of Hertfordshire in the United Kingdom.

The triple protocol approach is faster and more effective than traditional methods for treating chemically contaminated patients, the researchers contend. Further, immediate “dry” decontamination using any available absorbent material can be highly effective as a stand-alone procedure, removing up to 99 percent of contamination.

“Disrobing and dry decontamination are steps that can be taken by the affected individuals themselves under the direction of response personnel, without waiting for equipment set up,” Bright noted. “The addition of dry decontamination to the overall response also minimizes the accumulation of hazardous material in the subsequent decontamination steps.”

The guidance recommends that first responders have enough absorbent materials available on emergency response vehicles so that emergency dry decontamination can begin as quickly as possible. Further, they should make sure that there are enough washcloths and towels for use in wet decontamination, and blankets or temporary clothes to protect patients from hypothermia afterward.

Also, experts from BARDA, the National Library of Medicine (NLM) at the National Institutes of Health, and the University of Hertfordshire created a decision-support tool called ASPIRE or the Algorithm Suggesting Proportionate Incident Response Engagement. The tool is designed to help



responders determine which decontamination approaches will work best in a given situation. With the ASPIRE tool, emergency management planners and responders can tailor decontamination plans and emergency responses based on the chemical and the type of exposure, how quickly the chemical evaporates, and the amount of time that has passed since exposure.

Both ASPIRE and the updated guidance are integrated into the Chemical Hazards Emergency Medical Management (CHEMM) online resource manual created by NLM and the Office of the Assistant Secretary for Preparedness and Response within the U.S. Department of Health and Human Services. They will also be incorporated into the latest edition of the CHEMM mobile app.

<https://homelandprepnews.com/countermeasures/32654-researchers-update-guidance-for-first-responders-on-treating-chemical-exposure/>

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## US ARMS CONTROL

USA Today (McLean, Va.)

### **Trump-Kim Summit Day 1: Nuclear Weapons (and Michael Cohen)**

By David Jackson

Feb. 27, 2019

HANOI – President Donald Trump opened an historic second summit with Kim Jong Un here Wednesday by pledging to push for North Korean denuclearization, even as he faced a political firestorm at home that threatens to eclipse any progress.

"I think it'll be very successful," Trump said as he and Kim posed for the cameras, proclaiming that he and his North Korean counterpart have a "great relationship." At another photo opportunity, Kim said he is certain of an outcome "that will be welcomed by all people," and "I will do my best to make that happen."

But Trump's diplomatic efforts come as his former personal attorney, Michael Cohen, is expected to allege "criminal conduct" by the president in his first public testimony later Wednesday before Congress.

Trump met with Kim for a brief private conversation, followed by a "social dinner," all marking their first face-to-face encounter since the two met in Singapore last summer.

The ceremonial events, splashed across U.S. television screens early Wednesday morning, are expected give way to more substantive talks on the second and final day of the summit Thursday.

Simply put, Trump is trying to get Kim to commit to specific steps to eliminate nuclear weapons programs, while Kim wants Trump to lift economic sanctions that are crippling his impoverished nation.

In urging denuclearization, Trump told Kim that "some people would like to see it go quicker, but you're satisfied, I'm satisfied." He also suggested giving up nuclear weapons would draw economic assistance, telling Kim that North Korea has "unbelievable, unlimited potential," and "I look forward to watching it happen and to helping it to happen."

Asked about another goal – formally ending the Korean War – Trump told reporters, "we'll see."

Meanwhile, Trump and other White House officials, mindful that the visit to Vietnam is competing for public attention among millions of Americans, attacked Cohen in the hours before the Kim meeting.

Trump tweeted that Cohen "did bad things unrelated to Trump," and "is lying in order to reduce his prison time."

Michael Cohen was one of many lawyers who represented me (unfortunately). He had other clients also. He was just disbarred by the State Supreme Court for lying & fraud. He did bad things unrelated to Trump. He is lying in order to reduce his prison time. Using Crooked's lawyer!

— Donald J. Trump (@realDonaldTrump) February 27, 2019

Some foreign policy analysts said they worry that Trump will be too willing to strike a bad deal with Kim in order to draw attention from his domestic problems, including Cohen's testimony.

"Congress should have postponed Cohen testimony, and Potus should not be tweeting about Cohen from Hanoi," tweeted Richard Haass, president of the Council on Foreign Relations.

Trump appeared annoyed when reporters asked him about Cohen at one of the summit photo opps. The White House later restricted reporter access to the dinner with Trump, Kim, and their aides.

The president did say he plans to hold a news conference after Thursday's meetings with the North Korean leader.

Trump also spent some pre-meeting time launching a Twitter attack on one of his congressional critics, Sen. Richard Blumenthal, D-Conn., and claiming he discussed the senator's exaggerations about his war record in a meeting with Vietnam officials.

Tweeting that "I have now spent more time in Vietnam than Da Nang Dick Blumenthal," Trump added that "his war stories of his heroism in Vietnam were a total fraud - he was never even there. We talked about it today with Vietnamese leaders!"

Trump did not serve in the military during the Vietnam years, claiming college and medical deferments that included bone spurs in his foot.

The tumult back in Washington – lawmakers are also busy with a measure, approved by the Democratic-controlled House, to repeal Trump's border wall emergency – threaten to overshadow the work in Hanoi.

The president's troubles only add to the pressure to deliver results with Kim, who has signaled an interest in stronger relations with the United States but declined to dismantle his nuclear program.

In the days leading up to the summit, Trump appeared to lower expectations, claiming he is "in no rush" for denuclearization as long as Pyongyang continues to suspend missile tests.

Hours before the sit-down with the North Korean leader, Trump held largely ceremonial meetings with the leaders of Vietnam, and said their country can be a model for Kim, whom he described as "my friend."

"Vietnam is thriving like few places on earth. North Korea would be the same, and very quickly, if it would denuclearize," Trump tweeted early in the day.

More than four decades after the Vietnam War, the Vietnamese view the summit as an opportunity to assert themselves on the world diplomatic stage. Heavily promoting the Trump-Kim summit, light poles in Hanoi are festooned with the flags of the U.S., North Korea and Vietnam, mounted on a shield featuring an image of a handshake.

Large posters advertising the summit proclaim Hanoi as "The City For Peace."

Trump and Kim met at the Sofitel Legend Metropole Hotel, an Art Nouveau masterpiece that harkens back to French colonial days in Hanoi. Past guests at the hotel have ranged from the comedian Charlie Chaplin to current Russian President Vladimir Putin.

Among the issues on the Trump-Kim agenda:

What exactly is 'denuclearization'

Trump and aides have demanded that North Korea identify and destroy facilities used to make nuclear weapons. Kim, however, believes denuclearization should cover the entire region – including U.S. weapons systems designed to protect ally South Korea.

Economic sanctions standoff

Kim says he will not take major steps toward denuclearization until the United States and other countries lift at least some of the sanctions that have crippled North Korea's economy.

Trump has said sanctions will not be removed until Kim starts to denuclearize, though he has also held out the possibility of other economic assistance.

Chairman Kim realizes, perhaps better than anyone else, that without nuclear weapons, his country could fast become one of the great economic powers anywhere in the World. Because of its location and people (and him), it has more potential for rapid growth than any other nation!

— Donald J. Trump (@realDonaldTrump) February 24, 2019

The economy is one of the reasons the U.S. agreed to meet in Vietnam. It hopes North Korea will follow the model of its communist ally, which developed a quasi-capitalist sector after economic reforms in the 1980s.

North Korea-U.S. relations

While neither leader is expected to open an embassy in the other's country, negotiators are discussing "liaison offices" that could be used to improve communications between the two governments.

A formal end to the Korean War

Trump has been open to a treaty to formally end the Korean War, which is technically ongoing even though hostilities were suspended with an armistice in 1953.

Negotiators are working on what aides called a "peace declaration," a non-binding political statement to affirm North and South Korea are no longer at war.

The history: How the North and South negotiated a truce in Korean War

Sung-Yoon Lee, a Korea expert with the Fletcher School at Tufts University, said Kim wants to do just enough to satisfy Trump – "like retiring an exhausted nuclear site he no longer needs" – while retaining a weapons program he depends on for survival.

"Two steps forward and one step back is still progress for North Korea," he said.

Olivia Enos, a policy analyst with the Asian Studies Center at The Heritage Foundation in Washington, said she hopes Trump and his team tread cautiously. Give too much, she said, and the U.S. will lose its leverage and get little in return.

"The president's willingness to compromise threatens to undermine the administration's maximum pressure strategy that brought Kim Jong Un to the negotiating table in the first place," she said.

While analysts worried that Trump might give up too much to Kim, Cohen planned to mention the president's Vietnam trip in his testimony.

In a prepared statement first reported late Tuesday by Politico, Cohen cited the deferments Trump received during the Vietnam War.

"You think I'm stupid, I wasn't going to Vietnam," Cohen quotes Trump as saying.

In his prepared testimony, Cohen adds: "I find it ironic, President Trump, that you are in Vietnam right now."

<https://www.usatoday.com/story/news/politics/2019/02/27/trump-kim-summit-day-1-nuclear-weapons-and-michael-cohen/2924934002/>

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The Hill (Washington, D.C.)

## **General Warns about Weapons Not Covered by Nuclear Arms Pact with Russia**

By Rebecca Kheel

Feb. 26, 2019

The general in charge of the U.S. nuclear arsenal said Tuesday he remains a "big supporter" of a treaty that caps the number of deployed nuclear warheads allowed by the United States and Russia, even as he expressed concern that new styles of weapons are not covered by the pact.

"It is still my view, I've said it multiple times, I'm a big supporter of the New START agreement," said Gen. John Hyten, commander of U.S. Strategic Command. "I want, ideally, in my view, all nuclear weapons to be part of the next phase of the New START and not just the identified weapons in the New START Treaty."

Hyten was testifying before the Senate Armed Services Committee alongside the commander of U.S. Northern Command.

New START, which was signed by former President Obama, caps the number of nuclear warheads the United States and Russia can deploy at 1,550 each. There are also limits on the number of deployed intercontinental ballistic missiles (ICBM), submarine-launched ballistic missiles (SLMB) and heavy bombers equipped for nuclear warheads, as well as the number of deployed and non-deployed launchers for each.

The treaty expires in February 2021, but there is an option to extend it for another five years after that.

Nonproliferation advocates have expressed concern that President Trump will let the treaty expire after he withdrew from a separate arms treaty with Russia.

At the beginning of February, Trump officially announced he would withdraw from the Intermediate-range Nuclear Forces (INF) Treaty, which bans ground-launched ballistic and cruise missiles with certain ranges.

Current and former officials broadly agree Russia has been in violation of the INF Treaty for years, but there have been no reports of New START violations.

When Trump announced the INF withdrawal, the administration said no decision had been made on New START.

Trump has previously said New START is “just another bad deal” made by the Obama administration. And critics of the agreement say Russia cannot be trusted to comply with it if Moscow has already violated the INF Treaty.

Hyten, who reiterated Russia has been in violation of INF for five years, said he has talked with Trump about both New START and INF.

In his testimony, Hyten said one of the important aspects of New START is the inspection requirements, which allow the United States and Russia to examine each other’s nuclear forces.

“It gives me insight, though the verification regime, to their real capabilities,” he said. “The INF Treaty, for example, doesn’t have a verification regime anymore.”

Without New START, he said, there is “really nothing” the U.S. intelligence community can do “that can replace the eyes-on, hands-on ability to look at something.”

The issue, though, is the treaty only covers weapons that existed when it was put in place. That means technology Russia is working on, including hypersonic missiles and submarine drones, won’t be covered, Hyten said.

But Hyten also noted the United States could bring up adding those weapons to the treaty at what’s known as the Bilateral Consultative Commission, where the United States and Russia discuss issues related to the implementation of the treaty.

“I want Russia in every treaty,” he said. “I want Russia in the INF Treaty. I want Russia in the New START treaty. I support those treaties, but they have to be parties to those treaties. It takes two to participate in treaties, at least.”

<https://thehill.com/policy/defense/431655-general-expresses-concerns-about-weapons-not-covered-by-nuclear-arms-pact-with>

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Japan Times (Tokyo, Japan)

## **Global Arms Control Architecture ‘Collapsing’ with Russia-U.S. INF Pullout, Says U.N. Chief Antonio Guterres**

By AFP-JIJI

Feb. 26, 2019

GENEVA - The international arms control system is facing collapse, the United Nations chief said Monday, as he urged Russia and the U.S. to stop the imminent demise of a crucial nuclear treaty.

Secretary-General Antonio Guterres used an address to the U.N.’s Conference on Disarmament to warn that one of the cornerstones of diplomatic achievement over the last half century — arms control — was in “grave danger.”

“I will be blunt. Key components of the international arms control architecture are collapsing,” Guterres said.

The United States has already begun the process of withdrawing from the Intermediate-Range Nuclear Forces (INF) treaty, in response to Moscow’s deployment of the 9M729 missile, prompting Russia to announce its own withdrawal.

“We simply cannot afford to return to the unrestrained nuclear competition of the darkest days of the Cold War,” Guterres said.

“I call on the parties to the INF Treaty to use the time remaining to engage in sincere dialogue on the various issues that have been raised,” he added. “It is very important that this treaty be preserved.”

The collapse of the 1987 treaty, which banned ground-launched missiles with a range of 500 to 5,500 kilometers, has sparked fears of a new arms race in Europe.

The U.S. withdrawal is not set to take effect until August, giving a six-month window to save the treaty, but few expect that to happen and NATO has warned the world should ready itself for the pact to be scrapped.

Guterres recalled that despite a mutual lack of trust, the U.S., the former Soviet Union and later Russia agreed to a series of arms control agreements through a commitment to strict verification, which became “one of the hallmarks of international security.”

He voiced hope that nations would recommit to the principles of verification and compliance to forge urgently needed deals covering nuclear weapons and new technologies like “hypersonic weapons that could be used to launch attacks at unprecedented speed.”

U.N.-backed negotiations are underway to govern the use of so-called killer robots — weapons that can deploy lethal force without a human making the final decision to launch a strike.

But those talks have moved at a glacial pace, with activists accusing major powers of dragging their feet.

Guterres warned that new technologies are changing the arms control landscape “in ways we do not yet understand and cannot even imagine.”

“We need a new vision for arms control in the complex international security environment of today,” he added.

<https://www.japantimes.co.jp/news/2019/02/26/world/global-arms-control-architecture-collapsing-russia-u-s-inf-pullout-says-u-n-chief-antonio-guterres/>

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The Hill (Washington, D.C.)

## **UN Nuclear Watchdog: Iran Maintains Compliance with 2015 Pact**

By Tal Axelrod

Feb. 22, 2019

The United Nations’ nuclear watchdog confirmed Friday that Iran remained within key parameters set in the 2015 nuclear pact it signed with the U.S. and other world powers.

The news that Iran is respecting the nuclear limits, contained in a confidential report from the International Atomic Energy Agency (IAEA) that was uncovered by Reuters, comes as the Trump administration has renewed U.S. sanctions on the country after deciding to withdraw from the deal last year.

Trump has repeatedly criticized the deal as a “disaster” since he began campaigning for president in 2015, saying it did not effectively deal with Iran’s ballistic missile program or support for armed groups in the Middle East.

He also claimed it would only delay Iran from attaining a nuclear weapon, rather than prevent it.



The IAEA certified that Iran was complying with the deal as recently as August. Tehran has maintained its nuclear program is solely for defensive purposes.

The White House reimposed stringent sanctions after its withdrawal from the deal in the hopes that Iran would come back to the negotiating table to work out a new one.

European signatories of the deal, including Germany, France and Britain, have sought to blunt the effects of those sanctions by improving trade relations with Iran, a decision that infuriated White House officials.

Vice President Pence broadsided European allies last week, calling for them to cut off trade with Tehran and pull out of the nuclear pact themselves.

"The time has come from our European partners to withdraw from the Iran nuclear deal and join us as we bring the economic and diplomatic pressure necessary to give the Iranian people, the region and the world the peace, security and freedom they deserve," he said at the Munich Security Conference.

<https://thehill.com/policy/international/middle-east-north-africa/431144-un-nuclear-watchdog-iran-maintains-compliance>

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## COMMENTARY

The Hill (Washington, D.C.)

### **Bravado Could Escalate India-Pakistan Attacks to Nuclear Level**

By Simon Henderson

Feb. 27, 2019

The Pakistani and Indian air forces clashed this morning, with both Islamabad and New Delhi claiming victories. Forty Indian paramilitaries died in a Feb. 14 suicide bomb attack in Indian Kashmir, and the Indian Air Force may have destroyed a terrorist base and training camp in Pakistan in retaliation on Feb. 26. Is there going to be further escalation between the two nuclear-armed neighbors? Possibly. Will there be a nuclear element? That, I am sorry to have to say, also is possible.

Welcome to South Asia, where the rival militaries have gamed for years a nuclear war that isn't quite Armageddon — the war to end wars — but an exercise in bravado, national pride and humiliating the other side.

India first tested a so-called "peaceful nuclear device" in 1974. A Hindu nationalist government tested another in 1998, prompting Pakistan to test two devices in the following weeks. (Don't believe the larger, exaggerated numbers flung around for the number of tests. There was a lot of spin then, as there is now.)

If only the Indian and Pakistani militaries confined their competitive machismos to the absurd theater of the end-of-day lowering of their national flags at the Wagah border crossing, when rival soldiers chosen for height and military stiffness bid to outperform each other.

Even a limited nuclear exchange between the two rivals would produce anything between 10 million and 100 million casualties, mostly civilian, in the cities of the Punjab province which straddles the border. The discrepancy in the figures is a consequence of the mathematical variable

of at what height nuclear bombs are detonated. The smaller figure suggests detonation high in the air. If it is on the ground, or close, the blast flings a huge amount of dirt into the atmosphere, which means that, although you might survive the blast, the subsequent radioactive fallout would kill you in the weeks following.

The Pakistani military's fear is that the Indian army has an overwhelming advantage, in terms of men and tanks, so may mount a "Cold Start" conventional attack that quickly could seize the major Pakistani city of Lahore and effectively win a war without employing nuclear weapons. As a consequence, whereas India, initially at least, developed strategic nuclear weapons designed to reach all of Pakistan, the latter's military switched to tactical nuclear weapons to stop dead any Cold Start Doctrine adventure.

But how easy would it be to halt Indian tank divisions pouring across the desert in the flat border region south of the mountainous terrain of Kashmir, where the current action is taking place? It may sound that I have strange friends, but I know people who have "run the numbers" on this. The answer is that it would take more than 20 Pakistani nuclear weapons to blunt an Indian attack.

The conventional wisdom is, or certainly was, that nuclear weapons create a balance of terror between rivals. That logic may have applied in the days of the Cold War between the United States and Soviet Union, but it no longer is valid — at least between India and Pakistan.

Behind the scenes, officials in Washington, London, Paris, Berlin, and perhaps elsewhere, almost certainly are trying to deescalate the latest Kashmir crisis. Over the years, there have been numerous carefully orchestrated Track II meetings between retired senior members of the rival militaries, designed to produce mutual understanding and thwart imaginable crises.

Elements of the resulting script are obvious. Pakistan denied any link to the original terrorism attack. There was then a forced pause as first Pakistan and then India played host to previously planned visits by Saudi Crown Prince Mohammad bin Salman, aka MbS. India finally launched retaliatory air attacks, which Pakistan claimed merely destroyed hilly forest areas.

Does the crisis stop here? Is honor satisfied? Adherence to any sketched-out game plan appears a little loose. A retired Pakistani general said his nation's flag would be planted in New Delhi, the Indian capital. Another official said Pakistan would retaliate at a time and place of its choosing.

This doesn't sound good. A working assumption is that the Pakistani military, which operates separately and usually above any civilian administration in Islamabad, started the crisis. Possible motivation was concern about peace talks in Afghanistan, which they habitually think work in India's strategic favor.

The last major border crisis, in the Kargil heights in 1999, was orchestrated by Pakistan, thinking that India would not escalate it into a nuclear exchange. But Pakistan badly underestimated Indian determination. Although it blunted Indian air attacks with hastily-gifted North Korean anti-aircraft missiles, in the end its forces were annihilated by Indian artillery. Pakistan never publicly admitted the real number of its casualties.

Today, Prime Minister Imran Khan was chairing a meeting with the authority that oversees Pakistan's nuclear arsenal but also offered talks with India to ease tensions.

National pride and honor can be tricky variables, especially when not accompanied by common sense.

Simon Henderson is the Baker Fellow and director of the Bernstein Program on Gulf and Energy Policy at the Washington Institute for Near East Policy.

<https://thehill.com/opinion/international/431671-bravado-could-escalate-india-pakistan-attacks-to-nuclear-level>

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Bulletin of the Atomic Scientists (Chicago, Illinois)

## **Missing from the 2019 Missile Defense Review: Cybersecurity**

By Lauren Borja

Feb. 22, 2019

The 2019 Missile Defense Review promises to create US “missile defense programs to counter the expanding missile threats posed by rogue states and revisionist powers to us, our allies, and partners, including ballistic and cruise missiles, and hypersonic vehicles.” It expands the role of current defense systems that defend against global threats, while pursuing unproven technology. But one important criterion for US missile defenses is entirely absent from the Missile Defense Review: cybersecurity.

The protection of critical computer systems, networks, and data can be achieved through both technical and social means. Good cybersecurity includes robust computer software and hardware, prudent engineering standards, and vigilant cyber hygiene—the procedures and practices required of network users to keep information and data on the network secure. Sometimes people assume that the security of a network is based entirely on the way it has been constructed; however, it is also important to consider how individuals interact with the network when assessing its security. Best practices usually include regularly installing system updates, using multi-factor authentication, enforcing compartmentalized [“need to know”] user permissions, establishing strong password rules and multi-authorization procedures, ensuring that firewalls are properly installed, updating both “white lists” and “black lists,” and not connecting unknown data storage devices—such as CDs and thumb drives—to a network.

These activities may sound mundane, but poor cyber hygiene has compromised many secure networks, including some classified US military networks. In 2008, the National Security Administration detected a rapidly-spreading computer virus on computers inside the Pentagon. William Lynn, who was the Deputy Defense Secretary at the time, wrote in *Foreign Affairs* that the virus was inserted “when an infected flash drive was inserted into a US military laptop at a base in the Middle East.” This lapse in cyber hygiene took the US Defense Department 14 months to fix.

After this incident, one would expect cybersecurity to be at the top of the list of concerns of the 2019 Missile Defense Review. But in fact, the review does not discuss how to address cyber vulnerabilities in existing missile defense systems, or how to prevent cyberattacks from occurring in these systems in the future.

By ignoring cybersecurity concerns, the Trump administration’s plans will contribute to the problems that currently plague US missile defense systems: Such systems are often overpromised, overbudget, and behind schedule. The history of missile defense systems accidents shows that these systems are often rushed into the field before errors in their software and hardware have been fixed. And subsequent poor cyber hygiene in US missile defense systems leaves them increasingly vulnerable to cyberattack. In other words, expanding US missile defense systems while ignoring cybersecurity will likely lead to increased—not decreased—security concerns.

Software problems in US missile defense. Even in the absence of cyberattacks, software problems exist within US missile defense systems. In 2003, the Patriot missile defense system, employed to

defend against missiles during the Iraq War, was responsible for the death of three airmen in three separate friendly-fire incidents. The first incident involved a Patriot missile mistakenly targeting and destroying a British Tornado fighter plane. Its two crew members were killed instantly. In the second incident, a US F-16 fighter plane fired on a Patriot missile system after it erroneously targeted his aircraft. The third fatality occurred when a Patriot system shot down a US F/A-18 fighter plane, killing the pilot.

The summary of the ensuing official fact-finding report identified some of the problems that led to these incidents. Chief among them: the Patriot missile system had trouble distinguishing between friendly and enemy aircraft, a defect which had been previously observed in training exercises.

Documentation from operational tests of the Patriot missile system around the same time as the accident revealed a history of false identifications. Records from as late as 2001—a mere two years before the system was used in combat during the Second Persian Gulf War—described problems with target identification in the missile defense system. In 2002, the same researchers recommended more operational testing, even while noting the army's immediate need for hundreds more missiles for the already-deployed Patriot systems.

Evidently these priorities—making the system available quickly, and building a system that is safe to operate—were in conflict for the Patriot missile defense system. As later accidents revealed, availability was prioritized over safety, and systems were sent into the field with significant software and hardware problems.

Current systems within missile defense, such as their command and control networks, continue to be deployed with significant known vulnerabilities, according to a 2018 Government Accounting Office (GAO) report. (Command and control networks link decision makers, sensors, and weapons systems; they enable the planning, management, and operations of various missile defense systems.)

According to the report, many of the computers used to coordinate missile defense operations use Windows XP, an outdated and vulnerable operating system for which Microsoft no longer releases updates. (It was originally launched in 2001, an eternity in the world of computing, where six months is considered an entire generation.) Computers running outdated operating systems have provided easy targets for hackers. For example, the WannaCry ransomware attack in May 2017 specifically targeted computers running unpatched Microsoft operating systems. The United Kingdom's National Health Service was among the hardest hit; a report published contemporaneously criticized the organization's continued reliance on Windows XP.

While the US Missile Defense Agency (the organization responsible for overseeing all of the US' missile defense system) says that no cyberattacks have been detected as of 2017, vulnerabilities in the operating system have been exploited by the opposing team in internal cybersecurity exercises. The agency acknowledges that if "known deficiencies are exploited, mission capabilities like [missile defense] planning, radar control, track reporting, and situational awareness may be significantly degraded."

The same GAO report says that these cyber vulnerabilities will be fixed in the next planned upgrade of the command and control infrastructure, which is scheduled to occur in all global command centers by sometime in 2019. The GAO notes, however, that the updated version faces technical challenges and cost increases which could lead to delays in scheduled deliveries. Fixing the cybersecurity issues before this planned upgrade has been deemed "cost prohibitive," although the Missile Defense Agency had not specified the exact amount to the GAO at the time of the report.

In the 2019 Missile Defense Review, software is mentioned only once, and then merely as a way to add new capabilities to existing missile defense systems, such as countering hypersonic missiles.

Poor cyber hygiene in US missile defense. But bad as they are, the problems with faulty software and poor hardware in missile defense technology pale in comparison with the larger systemic problems within the missile defense development program. A report by the Defense Department's Inspector General, released in late 2018, found that many of the facilities that support US missile defense systems lacked basic cyber hygiene practices, proper security controls, and rudimentary data safeguards. These "exploitable weaknesses" could allow "US adversaries to circumvent [ballistic missile defense system] capabilities, leaving the United States vulnerable to deadly missile attacks."

The heavily redacted report described many of the unacceptable security practices at facilities that handle ballistic missile defense system data. Vulnerabilities that required immediate patches were left unaddressed for years, even after multiple warnings by cybersecurity teams. Two-factor authentication was not enforced, which could have led to unauthorized access to technical information about missile defense systems stored on classified networks. Unencrypted technical data was transmitted on missile defense system networks and stored on removable media storage devices. Finally, missile defense networks were not monitored for intruders or suspicious behavior—which should have been a part of standard operating procedures. Technology that monitors user behavior can help defend against threats from both outside (such as cyberattacks) and inside (such as the leaking of classified information by employees).

Six principles. All of these problems can harm the security of missile defense systems. Computer science experts know this, and so to create a secure computing system, they recommend following six principles: availability, reliability, safety, integrity, confidentiality, and maintainability.

Unfortunately, it appears that missile defense systems still struggle to achieve these principles. According to the authors of the 2018 redacted Inspector General's report, the unacceptable cybersecurity controls outlined above may have "disclose[d] critical details that compromise the integrity, confidentiality, and availability of [missile defense system] technical information." As the accidents mentioned earlier demonstrate, critical safety concerns have occurred as a result of faulty software. The fact that these errors were left in place in deployed systems without being addressed calls into question the trustworthiness of the entire enterprise. Remarkably, the 2019 Missile Defense Review does not address any of these issues.

Complaints about the cost and feasibility of US ballistic missile defense systems have been around for decades. Currently fielded systems, such as the ground-based midcourse system, have been described as "expensive and unreliable." But rather than fixing them and learning from mistakes in the already deployed systems, the United States government has been focused on proposing entirely new systems, such as space-based missile interceptors.

The tendency of missile defense systems to run behind schedule and over budget also has an impact upon their cybersecurity. These factors have led to missile defense systems being fielded before their mission-critical cyber vulnerabilities were fixed. The pressures created by these tendencies can also limit the time and money used to patch debilitating cyber vulnerabilities in systems that are currently in use.

Ignoring cybersecurity in both missile defense technology and the 2019 Missile Defense Review is a grave mistake. By not addressing existing concerns, it is hard to see how such defenses can provide dependable security for the United States. Instead of delivering on its promises, the 2019 Missile Defense Review is more likely to increase vulnerabilities within US missile defense systems. Faulty cybersecurity is yet another reason why dependable missile defense systems struggle to become a reality.

<https://thebulletin.org/2019/02/missing-from-the-2019-missile-defense-review-cybersecurity/>

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Atlantic Council (Washington, D.C.)

## **Try Taming Rather Than Laming Iran's Missile Program**

By Greg Thielmann

Feb. 25, 2019

From its early days, the Trump administration has sought to isolate and weaken the Islamic Republic of Iran, using Iran's missile and space launch programs as a key justification.

In addition to withdrawing from the Joint Comprehensive Plan of Action (JCPOA) in May 2018, expanding extensive trade sanctions, and severely restricting travel to the US by Iranians, the Trump White House "has also accelerated a secret American program to sabotage Iran's missiles and rockets," according to a recent report in The New York Times.

Such "scorched earth" policies are shortsighted and counterproductive. The United States should instead focus on forestalling Iran's ability to arm its missiles with nuclear warheads and discouraging it from extending the missiles' range.

Ballistic missiles have long played a role in shaping US attitudes toward Iran. Officially, the United States is opposed to the possession of any missiles capable of carrying a nuclear payload by any country other than the five nuclear weapons states designated in the 1968 nuclear Non-Proliferation Treaty (NPT). In reality, exceptions are made for America's friends: Israel, India, Saudi Arabia and South Korea, among them. But for those deemed hostile to America such as Iran, Washington has zero tolerance for either ballistic missiles or space-launch vehicles. Washington's visceral opposition to Iran's ballistic missile program is heightened by Iran's historical connections with North Korea, its supply of missiles to Hezbollah in Lebanon and Houthi rebels in Yemen, as well as its regular comments about Israel's destruction.

However undesirable in terms of US interests, Iran's emphasis on missiles is understandable. Iranians remember the missile salvos they suffered from Iraq during the 1980-1988 war when the United States tilted toward Saddam Hussein. Tehran is also well aware that three of its regional neighbors—Israel, Saudi Arabia and Pakistan—have long-range ballistic missiles and two—Israel and Pakistan—maintain nuclear arsenals. Although Iran is party to the NPT, Israel and Pakistan are not.

Until very recently, there has been no limit on the flow of sophisticated conventional weapons from the United States and Europe into regimes that are avowed enemies of Iran, such as Israel and Saudi Arabia (which enjoys a special relationship with nuclear-armed Pakistan).

But these realities are not considered exculpatory or even relevant for Washington. Indeed, President Donald Trump's National Security Advisor John Bolton and Israel's Prime Minister—and Trump booster—Benjamin Netanyahu openly advocate for war with Iran.

However, objectively assessed, Iran is less threatening to core US interests than it has been for many years. As the International Atomic Energy Agency regularly assesses, Iran continues to comply with the JCPOA, making any near-term nuclear threat in the Middle East much less likely.

Likewise, Iran's projected capability to attack the US mainland—11,000 km distant—with Intercontinental Ballistic Missiles (ICBMs) in the mid-term future is fading. When a US National Intelligence Estimate (NIE) projected foreign ballistic missile threats in 1999, it included North Korea, Iran and Iraq. The estimate warned, "Iran could test an ICBM that could deliver a several-



hundred kilogram payload to many parts of the United States in the last half of the next decade.” Throughout that decade and even beyond, most US intelligence agencies continued to project that Iran would probably test an ICBM by 2015.

Yet as the twentieth anniversary of that seminal NIE approaches, Iran has not deployed or even tested any ballistic missiles with a range over 2,000 kilometers. Although Iran has the largest arsenal of short- and medium-range ballistic missiles in the region, Tehran’s civilian and military leaders declare no need to acquire longer-range missiles, choosing instead to enhance the accuracy and survivability of its conventionally armed ballistic missile force.

The value for Iran of these weapons is heightened by the country’s lack of a powerful fleet of modern aircraft or modern and mobile ground forces. Given such circumstances, it would seem naïve and nonsensical to expect Iran, even under a less ideological government, to abandon its most reliable deterrent against intimidation and attack.

Critics of Iran have focused on its satellite launch advances.

In 2009, Iran became the ninth country to succeed in putting a domestically built satellite into orbit using its own launcher. The Trump administration has repeatedly sought to equate space launch vehicles with long-range ballistic missiles, but outside experts disagree. Michael Elleman of the International Institute for Strategic Studies notes that Iran’s space rockets, Safir and Simourgh, “are optimized for satellite-launch missions, not as weapons-delivery systems” and are “ill-suited for conversion to ballistic missiles.” Although many aspects of developing space launch vehicles can be applied to ballistic missiles, the Iranian rockets are not stalking horses for ICBMs as the Trump administration implies.

Welcoming the scientific and environmental contributions of Iranian satellite launches would be a positive step toward a future-oriented and less contentious relationship between Iran and the West. Such a process could start small, with common sense gestures such as sponsoring technical/academic exchanges between universities and granting scholarships for young Iranian astro-physicists.

When a more rational administration policy toward Iranian missiles becomes possible—probably not until the end of the Trump/Bolton era—a more ambitious framework of cooperation can be devised and implemented.

The US and Europe could offer conditional assistance to Iran’s space-launch program in exchange for Tehran’s commitment not to develop or deploy longer-range military missiles (i.e. with ranges greater than 2,000 km).

The involvement of NASA, the European Space Agency, and Western firms would increase the transparency of Iranian Space Agency activities and minimize the risks of technology diversion to the military sector. Welcoming and enabling Iranian scientific advances would give substance to the US government’s rhetoric proclaiming goodwill toward the Iranian people. Most importantly, collaboration would yield economic and scientific benefits for all parties.

Iran’s formal acceptance of a ceiling on the range of its missiles would also remove the specter of Iranian ICBMs, substantially increasing prospects for avoiding huge US expenditures on missile defense programs and the predictable reactions of Russia that such programs would generate.

The United States can offer cooperation on Iran’s space program without abandoning its overriding objective of inhibiting missile proliferation. Such an offer could alter the dangerous current trajectory of US-Iran relations, leading instead to mutual benefits.

Greg Thielmann is a 25-year veteran of the US Foreign Service who retired as office director in the State Department’s Bureau of Intelligence and Research. He subsequently served as a staff member

of the Senate Select Committee on Intelligence and as a senior staffer of the Arms Control Association. Follow him on Twitter: @GregThielmann.

<https://www.atlanticcouncil.org/blogs/iransource/try-taming-rather-than-laming-iran-s-missile-program>

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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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