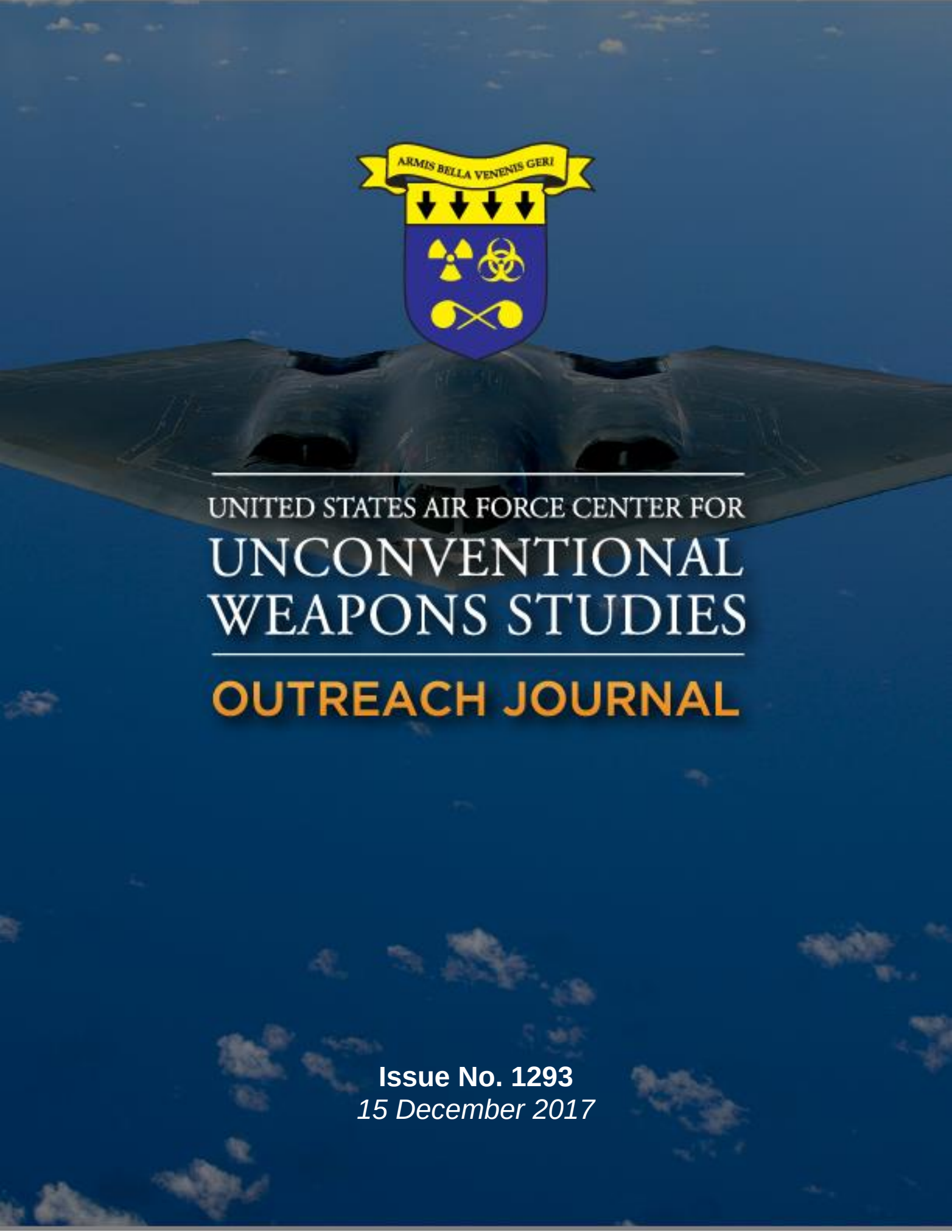

UNITED STATES AIR FORCE CENTER FOR

UNCONVENTIONAL WEAPONS STUDIES

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Featured Item

"*Russian Compliance with the Intermediate Range Nuclear Forces (INF) Treaty: Background and Issues for Congress*". Written by Amy F. Woolf, published by the Congressional Research Service; December 6, 2017

https://fas.org/sgp/crs/nuke/R43832.pdf

The United States and Soviet Union signed the Intermediate-Range Nuclear Forces (INF) Treaty in December 1987. Negotiations on this treaty were the result of a "dual-track" decision taken by NATO in 1979. At that time, in response to concerns about the Soviet Union's deployment of new intermediate-range nuclear missiles, NATO agreed both to accept deployment of new U.S. intermediate-range ballistic and cruise missiles and to support U.S. efforts to negotiate with the Soviet Union to limit these missiles. In the INF Treaty, the United States and Soviet Union agreed that they would ban all land-based ballistic and cruise missiles with ranges between 500 and 5,500 kilometers. The ban would apply to missiles with nuclear or conventional warheads, but would not apply to sea-based or air-delivered missiles.

The U.S. State Department, in the 2014, 2015, 2016, and 2017 editions of its report Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments, stated that the United States has determined that "the Russian Federation is in violation of its obligations under the [1987 Intermediate-range Nuclear Forces] INF Treaty not to possess, produce, or flight-test a ground-launched cruise missile (GLCM) with a range capability of 500 km to 5,500 km, or to possess or produce launchers of such missiles." In the 2016 report, it noted that "the cruise missile developed by Russia meets the INF Treaty definition of a groundlaunched cruise missile with a range capability of 500 km to 5,500 km, and as such, all missiles of that type, and all launchers of the type used or tested to launch such a missile, are prohibited under the provisions of the INF Treaty." The 2017 compliance report describes the types of information the United States has provided to Russia in pressing its claim of noncompliance, but it does not share the details of that claim in the report. Press reports from February 2017 indicate that Russia has now begun to deploy the new cruise missile.

The Obama Administration raised its concerns about Russian compliance with the INF Treaty in a number of meetings during the past few years. These meetings made little progress because Russia continued to deny that it had violated the treaty. In October 2016, the United States called a meeting of the Special Verification Commission, which was established by the INF Treaty to address compliance concerns. During this meeting, in mid-November, both sides raised their concerns, but they failed to make any progress in resolving them. The United States has also begun to consider a number of military responses, which might include new INF-range systems, both to provide Russia with an incentive to reach a resolution and to provide the United States with options for future programs if Russia eventually deploys new missiles and the treaty regime collapses. It might also suspend or withdraw from arms control agreements, although several analysts have noted that this might harm U.S. security interests, as it would remove all constraints on Russia's nuclear forces.

The United States could also consider a number of options for how it might respond now that Russia has begun to deploy new INF-range cruise missiles. It could develop and deploy new military capabilities—including, possibly, new land-based INF-range missiles or new missile defense capabilities—to offset the threat posed by new Russian INF-range missiles. The United States could also take other steps with its allies to assure them of the U.S. commitment to their defense.

The Trump Administration has not yet identified a path forward for the INF Treaty, although Secretary of Defense Mattis did address it during his nomination hearing. Congress is likely to continue to conduct oversight hearings on this issue, and to receive briefings on the status of Russia's cruise missile program. It may also consider legislation authorizing U.S. military responses and supporting alternative diplomatic approaches.

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US NUCLEAR WEAPONS

Defense News (Vienna, VA)

Trump Announces Pick for Nuclear Weapons Czar

By Aaron Mehta

December 12, 2017

WASHINGTON — U.S. President Donald Trump has announced his intent to nominate Lisa Gordon-Hagerty as undersecretary for nuclear security at the Department of Energy, the top job for managing America's arsenal of nuclear warheads.

The job includes filling the role of administrator for the National Nuclear Security Administration, a semiautonomous department within the Department of Energy. While the Defense Department manages the delivery systems of the nuclear force — ships, planes and missiles — NNSA has oversight over the development, maintenance and disposal of nuclear warheads.

The agency is currently run by Frank Klotz, the retired Air Force general who has been in the job since 2014. Klotz is the rare Obama-era appointee who was kept on when the Trump administration took office, although not without drama; after initial media reports that Klotz had been asked to resign during the transition, incoming Secretary of Energy Rick Perry reversed that decision and asked Klotz to remain in place.

While Klotz has received generally positive reviews from the nuclear community, Gordon-Hagerty brings a history of experience in nuclear issues, starting from her very first job as a physicist at Lawrence Livermore National Laboratory.

She is currently involved in leading two consulting firms: Tier Tech International and LEG Inc. Previously, Gordon-Hagerty served as the director for combating terrorism on the White House National Security Council for more than five years, stretching from the end of the Clinton administration into the Bush administration. She also previously worked at DOE, including as acting director of the Office of Nuclear Weapons Surety and a six-year stint as the director of DOE's Office of Emergency Response. She also has experience on Capitol Hill.

In addition, Gordon-Hagerty sits on the board of experts for the Federation of American Scientists, a well-respected group specializing in nuclear issues.

If formally nominated and confirmed, Gordon-Hagerty will have her hands full with a series of major modernization efforts underway, which could be altered by the results of the upcoming Nuclear Posture Review.

NNSA is engaged in a quintet of major warhead programs, including the W76-1 Life Extension Program, which will extend the life on the U.S. Navy's Trident II (D5) submarine-launched ballistic missile; the B61-12 Life Extension Program, which seeks to combine a number of B61 bomb variants into a more modernized nuclear gravity bomb; the W80-4 Life Extension Program, whose goal is to provide a warhead for a future long-range standoff missile that will replace the U.S. Air Force's current air-launched cruise missile; the IW-1 Life Extension Program, which is meant to create an interoperable warhead for various systems; and the W88 Alteration 370, which will replace the arming, fuzing and firing subsystem for the W88 warhead for the Trident II.

In addition, she will have to deal with a backlog of deferred maintenance that Klotz has warned could exceed $3.7 billion, as well as supporting nonproliferation efforts in North Korea and Iran.

https://www.defensenews.com/space/2017/12/12/trump-announces-pick-for-nuclear-weapons-czar/

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Aviation.ca (Calgary, Alberta)

Boeing Emphasizes Affordability, Modularity in New ICBM Design

By Boeing

November 30, 2017

ARLINGTON, Va., Nov. 30, 2017 – Boeing's [NYSE: BA] Ground Based Strategic Deterrent (GBSD) program successfully completed its first key review with the U.S. Air Force, validating program technical requirements prior to the design and development phase of America's next intercontinental ballistic missile system.

The November review established the baseline for the GBSD, which will replace the Minuteman III intercontinental ballistic missile (ICBM) and continue the nuclear deterrence mission for generations to come.

Boeing completed the System Requirements Review about two months after being awarded $349 million to mature the GBSD system design under a Technology Maturation and Risk Reduction contract.

"The Air Force set clear system design requirements early in the acquisition process," said Frank McCall, Boeing director of Strategic Deterrence Systems and GBSD program manager. "Thanks to this straightforward guidance, the Boeing team was able to focus on options that would meet those requirements and provide the capability needed to deter an evolving threat."

"We concentrated on modularity and affordability to enable efficient government ownership of the system through 2075 and beyond," McCall added.

Boeing's design addresses the replacement of the entire ICBM system, including new flight systems, weapon system command and control (WSC2), and launch systems within existing Minuteman silos.

Now that the requirements baseline has been set, Boeing will move through a series of cost-capability studies, weighing affordability against configuration options to come up with a GBSD solution that is capable, flexible and affordable.

Boeing will present its Preliminary Design Review to the Air Force in 2020.

https://www.aviation.ca/2017112922617/news/international/us/boeing-news-releases/22617-boeing-emphasizes-affordability-modularity-in-new-icbm-design

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Hilltop Times (Hill Air Force Base, Utah)

Flight Tests Help Qualify Nuclear Bomb for US, NATO Aircraft

By Leah Bryant

November 22, 2017

KIRTLAND AIR FORCE BASE, N.M. — The Air Force recently completed a series of initial tests to qualify a nuclear gravity bomb for multiple U.S. and NATO aircraft.

The B61-12, the follow-on to the family of B61 nuclear gravity bombs, is a key component of the U.S. nuclear deterrence strategy. Employed by a variety of U.S. and NATO aircraft, the B61-12 will also support extended deterrence commitments with U.S. allies and partners.

"This is the first major Air Force nuclear warhead modernization effort since the mid-1980s," said Col. Dustin Ziegler, Air Delivered Capabilities director for the Air Force Nuclear Weapons Center at Kirtland. "It is a major effort for AFNWC, paving the way for future nuclear modernization programs like the Ground-Based Strategic Deterrent and the Long Range Standoff weapon."

The testing program is a cooperative effort between the AFNWC and the National Nuclear Security Administration. The NNSA is performing a life extension program on the aging family of B61 nuclear bombs, while the Air Force, with the Boeing Company as the primary contractor, is developing a guided tail-kit assembly, or TKA.

The TKA will be paired with the life-extended B61 to produce the B61-12. The B61-12 will include improved safety, security, and reliability from the legacy variants. The first weapon qualification flight test was flown in March by an F-16, demonstrating the weapon's use with current fighter aircraft.

"We have an aggressive test schedule to drop 26 unarmed bombs in less than a year, from both F-15E and B-2 aircraft," said Col. Paul Rounsavall, AFNWC B61-12 senior materiel leader at Eglin AFB, Florida. "We are off to a great start."

Last week, three F-15E aircraft dropped unarmed B61-12s under different flight conditions, demonstrating the aircraft capability to employ the weapon. In July and August, F-15E aircraft dropped a total of four unarmed B61-12s.

"These tests showed the great teamwork provided by AFNWC's government and contractor team, in overcoming multiple challenges to provide proof of the tail kits reliability," Rounsavall said.

"The F-15E has been the workhorse platform during the development of the B61-12, with continual development of its software interface," said Col. Tim Bailey, F-15 system program manager. "It will continue to be the primary testing platform for qualification and reliability testing.

In June, the B61-12 was carried on a B-2 aircraft during a flight test, to demonstrate that the B-2 software integrating the guided B61-12 was on track, Rounsavall said.

"This test was a significant step in our program to integrate the B61-12, the first guided nuclear gravity bomb, onto the B-2 aircraft, and gave us confidence that we are on track to field this capability to Air Force Global Strike Command," said Col. Bill Patrick, B-2 system program manager. "I'm very proud of our combined B-2 team and their hard work at providing the warfighter with the tools they need to provide an effective and reliable nuclear deterrent."

"With the first production planned for early in the fiscal year 2020, we still have challenges ahead, but the interagency team, and all the multiple Air Force participants, have proven up to the task," Ziegler said. "The program has really energized the entire U.S. nuclear complex, and I'm excited about the future as we continue to modernize the U.S. capability to meet the deterrent needs of the 21st century."

Several Air Force units have contributed to the testing program, including the B-2 program office at Wright-Patterson AFB, Ohio; the F-15 program office at Robins AFB, Georgia, and Wright-Patterson AFB; the F-16 program office at Hill AFB, Utah; and multiple developmental and operational test squadrons from Eglin AFB; Edwards AFB, California; Barksdale AFB, Louisiana; Nellis AFB, Nevada; and Whiteman AFB, Missouri.

"The B61-12 design is proving to be solid, and we anticipate great results over the next several years of testing," Ziegler said.

Headquartered at Kirtland AFB, the Air Force Nuclear Weapons Center is responsible for synchronizing all aspects of nuclear materiel management on behalf of Air Force Materiel Command in direct support of Air Force Global Strike Command. The center has about 1,100 personnel assigned to 17 locations worldwide, including Eglin AFB; Hanscom AFB, Massachusetts; Hill AFB; Tinker AFB, Oklahoma; and Ramstein Air Base, Germany.

http://hilltoptimes.com/2017/11/22/flight-tests-help-qualify-nuclear-bomb-for-us-nato-aircraft/

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Scout Warrior (Brentwood, TN)

Air Force Tests Massive B-2 Stealth Upgrade

By Kris Osborn

November 19, 2017

The stealthy B-2 is slated to fly alongside the Air Force's new High-Tech B-21 - Bomber into the 2050s.

The Air Force is now testing new, high-tech sensors, software, electronics and other enemy radar-evading upgrades for its B-2 stealth bomber to preserve its stealth advantages and enable the aircraft to operate more effectively against increasingly capable modern air defenses.

The massive upgrade, designed to improve what's called the bomber's Defensive Management System, is described by Air Force developers as "the most extensive modification effort that the B-2 has attempted."

The Defensive Management System is a technology designed to help the B-2 recognize and elude enemy air defenses, using various antennas, receivers and display processors to detect signals or "signatures" emitting from ground-based anti-aircraft weapons, Air Force Spokesman Capt. Michael Hertzog said in a written statement several months ago.

The modernized system, called a B-2 "DMS-M" unit, consists of a replacement of legacy DMS subsystems so that the aircraft can be effective against the newest and most lethal enemy air defenses.

"This system picks up where mission planning ends by integrating a suite of antennas, receivers, and displays that provide real-time situational awareness to aircrew. The DMS-Modernization program addresses shortcomings within the current DMS system," Hertzog added.

Upgrades consist of improved antennas with advanced digital electronic support measures, or ESMs along with software components designed to integrate new technologies with existing B-2 avionics, according to an Operational Test & Evaluation report from the Office of the Secretary of Defense.

The idea of the upgrade is, among other things, to inform B-2 crews about the location of enemy air defenses so that they can avoid or maneuver around high-risk areas where the aircraft is more likely to be detected or targeted. The DMS-M is used to detect radar emissions from air defenses and provide B-2 air crews with faster mission planning information - while in-flight.

Air Force officials explain that while many of the details of the upgraded DMS-M unit are not available for security reasons, the improved system does allow the stealthy B-2 to operate more

successfully in more high-threat, high-tech environments – referred to by Air Force strategists as highly "contested environments."

Many experts have explained that 1980s stealth technology is known to be less effective against the best-made current and emerging air defenses – newer, more integrated systems use faster processors, digital networking and a wider-range of detection frequencies.

Upon its inception, the B-2 was engineered to go against and defeat Soviet air-defenses during the Cold War; the idea was to operate above enemy airspace, conduct attack missions and then return without the adversary even knowing the aircraft was there. This mission, designed to destroy enemy air defenses, was designed to open up a safety zone or "air corridor" for other, less stealthy aircraft to conduct attacks.

In order to accomplish this, B-2 stealth technology was designed to elude lower-frequency "surveillance" radar – which can detect the presence of an aircraft – as well as higher-frequency "engagement" radar precise enough to allow air defenses to track, target and destroy attacking aircraft, developers explained.

It is widely believed that modern air defenses such as these are now able to detect many stealth aircraft, therefore complicating the operational equation for bombers such as the B-2, senior Air Force officials have acknowledged.

These newer air defense technologies are exhibited in some of the most advanced Russian-built systems such as the S-300 and S-400. In fact, according to a report from Dave Majumdar in The National Interest and reports in the Russian media, the Russians are now engineering a new, more effective S-500 system able to hit some stealthy targets out to 125 miles or further.

In fact, The National Interest once cited a Russian media report claiming that "stealth" technology was no longer useful or relevant – a claim that is not believed to be true at all, or is at least unambiguously disputed by many experts and developers familiar with stealth technology.

For this reason, many senior Air Force developers have explained that – moving into the future – stealth technology is merely one arrow in a metaphorical "quiver" of offensive attack capabilities used by the B-2.

Nonetheless, Hertzog explained that upgraded B-2 stealth technology will have a much-improved operating ability and "strategic advantage" against a vastly wider range of air defenses.

"With necessary upgrades, the B-2 can perform its mission regardless of location, return to base safely, and permit freedom of movement for follow-on forces, including other long range strike platforms. Modifications such as the DMS-M are necessary to preserve this strategic advantage against 21st century threats," Hertzog added.

The DMS-M upgrade does not in any way diminish the stealth properties of the aircraft, meaning it does not alter the contours of the fuselage or change the heat signature to a degree that it would make the bomber more susceptible to enemy radar, developers said.

Many advanced air defenses use X-band radar, a high-frequency, short-wavelength signal able to deliver a high-resolution imaging radar such as that for targeting. S-band frequency, which operates from 2 to 4 GHz, is another is also used by many air defenses, among other frequencies.

X-band radar operates from 8 to 12 GHz, Synthetic Aperture Radar, or SAR, sends forward and electromagnetic "ping" before analyzing the return signal to determine shape, speed, size and location of an enemy threat. SAR paints a rendering of sorts of a given target area. X-band provides both precision tracking as well as horizon scans or searches. Stealth technology, therefore, uses

certain contour configurations and radar-absorbing coating materials to confuse or thwart electromagnetic signals from air defenses.

These techniques are, in many cases, engineered to work in tandem with IR (infrared) suppressors used to minimize or remove a "heat" signature detectable by air defenses' IR radar sensors. Heat coming from the exhaust or engine of an aircraft can provide air defense systems with indication that an aircraft is operating overhead. These stealth technologies are intended to allow a stealth bomber to generate little or no return radar signal, giving air dense operators an incomplete, non-existent or inaccurate representation of an object flying overhead.

Also, the B-2 is slated to fly alongside the services' emerging B-21 Raider next-generation stealth bomber; this platform, to be ready in the mid-2020s, is said by many Air Force developers to include a new generation of stealth technologies vastly expanding the current operational ranges and abilities of existing stealth bombers. In fact, Air Force leaders have said that the B-21 will be able to hold any target in the world at risk, anytime.

While many senior Air Force officials have made this point in recent years, the ability of the B-21 to strike anywhere in the world, was something emphasized by Lt. Gen. Arnold Bunch, Military Deputy, Office of the Assistant Secretary of the Air Force for Acquisition, told Scout Warrior last year in an exclusive interview.

Naturally, many of the details of these stealth innovations are, by design, not available for public discussion – according to Air Force and Northrop Grumman developers.

The DMS-M program achieved a key acquisition milestone last year, authorizing the program to enter what's called the Engineering Manufacturing and Development (EMD) phase.

"Major efforts during the EMD phase include the system Critical Design Review, completion of hardware and software development efforts, Integrated Test, and Initial Operational Test and Evaluation. Three aircraft will be modified during EMD to support the successful completion of this phase," Hertzog explained.

The program plans on achieving 2019 Full Rate Production following this phase in 2019.

The total Research Development, Test and Evaluation funding for B-2 DMS-M is $1.837B to develop four units, Hertzog added.

The B-2 is engineered and built by Northrop Grumman; the major subcontractors on the program are BAE (receivers), Ball Aerospace and L-3 Randtron (antennas), and Lockheed Martin (display processors).

Total procurement funding for the B-2 DMS-M program is $832M to procure 16 additional units.

The Air Force currently operates 20 B-2 bombers, with the majority of them based at Whiteman AFB in Missouri. The B-2 can reach altitudes of 50,000 feet and carry 40,000 pounds of payload, including both conventional and nuclear weapons.

The aircraft, which entered service in the 1980s, has flown missions over Iraq, Libya and Afghanistan. In fact, given its ability to fly as many as 6,000 nautical miles without need to refuel, the B-2 flew from Missouri all the way to an island off the coast of India called Diego Garcia – before launching bombing missions over Afghanistan.

https://scout.com/military/warrior/Article/Air-Force-Tests-B-2-Stealth-Sensor-Electronics-Upgrade-101455170

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US COUNTER-WMD

Defense News (Vienna, VA)

US Army Anti-Missile Command System Successful in More Complex Soldier Test

By Jen Judson

December 12, 2017

WASHINGTON — The second soldier test of a Northrop Grumman-developed anti-missile command-and-control system demonstrated it can perform in a highly complex and joint environment, according to Kenn Todorov, company vice president for missile defense solutions in its missions systems sector.

The Soldier Checkout Event, or SCOE, follows another successful one conducted in August. "This is really a master's level sort of exercise. The first one was maybe just an undergraduate level," Todorov told Defense News.

The second checkout was a live-air exercise which took place over three weeks in October at Yuma Proving Ground, Arizona, and involved soldiers from Fort Sill, Oklahoma, and a task force with the Marine Corps.

Fort Sill soldiers used Northrop's Integrated Air and Missile Defense Battle Command System, or IBCS — being developed for the U.S. Army's future Integrated Air and Missile Defense system — to direct Army air and missile defense sensors and weapons in "complex, multi-domain air defense operations," according to a company statement.

Todorov said Yuma Proving Ground provided a "realistic environment" for the system to be put through its paces.

The checkout included maintaining tracks on objects when sensors working alone are unable and could discern dozens of airborne platforms from unmanned aircraft systems, fighter aircraft, attack helicopters, attack aircraft, tankers, early warning aircraft, tilt-rotor aircraft and electronic attack aircraft, and then tag them as friend or foe.

"I think this SCOE II did really take things to the next level in complexity and the different kinds of tracks, different speeds, different altitudes," Todorov said. "If there was any doubt in our mind that we had addressed this software, you know the software was going to perform beautifully in a complex environment."

The checkout proved that IBCS will not only be an effective system for the U.S. Army, but as a joint asset and — as is the case with Poland, which is planning to buy IBCS to beef up its defenses against Russia — will prove effective against adversaries that are equipped to bring complexity to the battlefield, according to Todorov.

The second soldier checkout also proved IBCS can maintain a complete picture of the battlefield even when sensors and weapons systems networked into the system are under electronic attack or down for another reason.

There were "a lot of electronic attack elements that were put to the test," Todorov said, including sensors being shut down due to simulated electronic attack.

"Through the use of IBCS, because we were now linking feeds and tracks from different sensors, if another sensor wasn't subject to that sort of element of the attack, it would maintain situational awareness on either the threat or the asset," Todorov explained. "So sort of proving the value of this networked, open architecture approach."

IBCS showed it has the ability to "maintain the picture for the war fighter, which is really the exciting part for me as someone who's been out in a [combined air operations center] in a joint fight and watching the air defense commander try to struggle with systems that would go down either in an exercise or sometimes real world if there was spoofing going on, and now this system lets you work around that," Todorov said.

Todorov retired from his military career when he was deputy director of the U.S. Missile Defense Agency.

The test, again, proved out ease-of-use of the system. Some soldiers from the first checkout in August participated, but some new soldiers were brought in and rapidly trained.

The next IBCS milestone is another soldier checkout expected in the spring that will continue to test the system in different mission threads.

https://www.defensenews.com/land/2017/12/12/us-army-anti-missile-command-system-successful-in-more-complex-soldier-test/

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Homeland Preparedness News (Washington, DC)

House Panel Explores US Ability to Counter Weapons of Mass Destruction

By Aaron Martin

December 11, 2017

Leaders of the Department of Homeland Security (DHS) testified before a congressional panel on Thursday about the United States' ability to counter weapons of mass destruction and additional emerging threats.

U.S. Rep. Dan Donovan (R-NY), the chairman of the House Homeland Security Subcommittee on Energy, Preparedness, Response, and Communications, convened the hearing. DHS restructuring and potential organizational changes like the creation of the Countering Weapons of Mass Destruction (CWMD) Office, were covered.

"The scope of threats our nation faces each day continues to change and evolve," Donovan said. "We know that terrorist groups hope to employ new weapons, including chemical, biological, radiological and nuclear (CBRN) agents, to attack innocent people and cause destruction. It's critical that our security agencies are able to protect the homeland, and I'll be using the insight gathered to develop policies that help DHS further improve preparedness and response measures."

James McDonnell, the assistant DHS secretary for countering weapons of mass destruction, William Bryan, the acting DHS undersecretary for science and technology, and Chris Currie, the director of emergency management, national preparedness and critical infrastructure protection at the Government Accountability Office (GAO), were among the hearing's witnesses.

Witnesses voiced support for the creation of the CWMD Office. DHS leadership acknowledged plans to work with Congress to formalize the new division and to ensure its capable of confronting threats.

Creation of the office, DHS officials testified, would also improve U.S. defense against CBRN threats, enhance the strategic direction, allow for seamless sharing of best practices and reforms, and reduce agency overlap.

The hearing also explored the evolving scientific techniques used to manufacture biological weapons, including Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) technology.

https://homelandprepnews.com/stories/25686-house-panel-explores-us-ability-counter-weapons-mass-destruction/

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Scout Warrior (Brentwood, TN)

F-35 Sensor Performs Ballistic Missile Defense Missions

By Kris Osborn

December 7, 2017

The F-35's Distributed Aperture Sensor (DAS) has performed airborne identification and target tracking of a ballistic missile in a test off the coast of Hawaii as part of ongoing development of the 5th-generation aircraft's ability to conduct airborne ballistic missile defense missions.

Northrop Grumman and the Pentagon's Missile Defense Agency conducted a demonstration, using a ground-based DAS and a DAS-configured gateway aerial node to locate a ballistic missile launch and flight path. Target tracking information was sent using advanced data links to relay information between the aerial gateway and ground-based command and control locations.

According to Northrop engineers and weapons developers involved with the test, a sensor on the ground transmitted its tracking information to the DAS-equipped Airborne Gateway, which formed a three-dimensional space track which could be transmitted to San Diego.

"DAS can perform its mission whether airborne in an F-35 or other aircraft, as well as on the ground or in a ship. In this case, the two DAS sensors in the air and on the ground, respectively, were able to individually recognize the ballistic missile event and generate a two-dimensional track," Northrop experts told Warrior.

Described as multi-function array technology, the DAS system uses automated computer algorithms to organize and integrate target-relevant data from missile warning systems, radar, night vision and other long-range sensors; the array is able to track a BMD target from the air at distances up to 800 nautical miles. Such a technology, quite naturally, enables a wider sensor field with which to identify and track attacking missiles.

"DAS communicated precise BMD data from Pacific Missile Range in Hawaii to a test-bed location in San Diego. Seconds after launch, the DAS sensor categorized the rocket and located a ballistic missile launch," said John "Bama" Montgomery, 5th Generation Derivatives and Improvements, Northrop Grumman. "This re-organizes, re-imagines and re-shapes the battlespace."

Although the test was in 2014, it has only now been determined that the F-35 can perform BMD - due to years of analysis and test data examination, Northrop developers said. Such a defensive technical ability is of great relevance currently, as many express concern about North Korea short and medium range ballistic missile threats.

An airborne DAS, networked with ground-based Patriot and THAAD (Terminal High Altitude Area Defense) weapons, could offer a distinct tactical advantage when it comes to quickly locating incoming missile threats. Air sensors in particular, could be of great value given that, in some envisioned threat scenarios, it is unclear whether there would be enough interceptors to counter a massive North Korean ballistic missile barrage into South Korea. Accordingly, air based detection

and target tracking, it seems, could go a long way toward better fortifying defenses - as they might increase the time envelope during which command and control could cue interceptors to locate and destroy attacking enemy missiles.

Using early applications of artificial intelligence, computers and aircraft relied upon advanced algorithms to organize sensor information - which was then transmitted to a pilot.

As a key element of the F-35s much-discussed "sensor fusion technology," the DAS draws upon a 360-degree sensor field of view generated by six cameras strategically placed around the aircraft. The sensor autonomously fuses data from all of the sensors into a single field of view for the pilot.

"With an automated picture, we can get the pilot everything he needs without him needing to go through every step," Bama said.

Using F-35 DAS sensor technology, emerging technology can perform BMD sensing functions without needing to rely purely upon space-based infrared systems. Using LINK 16 and other data-link technologies, an F-35 can relay targeting data to other 5th and 4th-Generation aircraft as well as ground stations. Montgomery explained that MDA laboratory-generated detection, tracking and discrimination algorithms were able to provide 3-D tracking information.

An MDA statement said program officials have been evaluating system performance based upon telemetry and other data obtained during the test.

As part of this emerging technical configuration, it has been determined that the F-35s DAS can perform a wide range of non-traditional ISR functions to include not only BMD but other kinds of air or ground-fired enemy weapons. This includes an ability to detect artillery fire, enemy fighter aircraft, incoming air-launched missiles and, of course, ground launched rockets and missiles.

"DAS provides imagery. Instead of looking through a tube, this is a broader perspective of the combat environment, allowing a pilot to act more decisively. It provides a protective bubble to ensure that no aircraft can approach an F-35 without the F-35 knowing it is there," Montgomery added.

Weapons developers describe this technical advance in terms of something entirely compatible with ship-based Aegis radar, which is also configured to perform BMD functions. Aegis radar was used to track the ballistic missile target as well.

In fact, F-35 BMD sensor technology aligns closely with the Navy's now-deployed Naval Integrated Fire Control - Counter Air (NIFC-CA), an integrated system which uses ship-based Aegis radar, an airborne platform relay sensor and an SM-6 missile to track and destroy approaching enemy cruise missiles at distances beyond the horizon.

The concept is to give commanders a better window for decision-making and countermeasure applications when faced with approaching enemy fire. The Navy's layered ship defense system, involving SM-3s, ESSMs, SeaRAM, Rolling Airframe Missiles and closer-in systems such as Close-in-Weapons System using a phalanx area weapon, can best track and destroy targets when a flight path of an attacking ballistic missile can be identified earlier than would otherwise be the case.

The Navy and Lockheed have specifically demonstrated this system using an F-35 as an airborne sensor relay platform. NIFC-CA can be used both offensively and defensively, as it draws upon the SM-6s active seeker which can discern and attack fast-maneuvering targets.

The Navy is already building, deploying and testing a fleet of upgraded DDG 51 Arleigh Burke-class destroyers with NIFC-CA - as a way to bring an ability to detect and destroy incoming enemy anti-ship cruise missiles at farther ranges from beyond the horizon.

The technology enables ship-based radar to connect with an airborne sensor platform to detect approaching enemy anti-ship cruise missiles from beyond the horizon and, if needed, launch an SM-6 missile to intercept and destroy the incoming threat, Navy officials said.

NIFC-CA has previously operated using an E2-D Hawkeye surveillance plane as an aerial sensor node; it has also been successfully tested from a land-based "desert ship" at White Sands Missile Range, N.M. from an F-35 Joint Strike Fighter. Should the Navy's future plans materialize, the system would expand further to include the F/A-18 and F-35C.

NIFC-CA gives Navy ships the ability to extend the range of an interceptor missile and extend the reach sensors by netting different sensors of different platforms -- both sea-based and air-based together into one fire control system, Navy developers told Warrior.

NIFC-CA was previously deployed on a Navy cruiser serving as part of the Theodore Roosevelt Carrier Strike Group in the Arabian Gulf.

Operating NIFC-CA from an F-35B improves the sensor technology, reach, processing speed and air maneuverability of the system; previous tests have also assessed the ability of the system to identify and destroy air-to-air and air-to-surface targets. A report from earlier this year from the U.S. Naval Institute news quoted Lockheed officials saying an "at-sea" assessment of this NIFCA-CA/F-35 pairing is planned for 2018.

NIFC-CA has previously operated using an E2-D Hawkeye surveillance plane as an aerial sensor node; the use of an F-35B improves the sensor technology, reach, processing speed and air maneuverability of the system; the test also assessed the ability of the system to identify and destroy air-to-air and air-to-surface targets. A multi-target ability requires some adjustments to fire-control technology, sensors and dual-missile firings; the SM-6 is somewhat unique in its ability to fire multiple weapons in rapid succession. An SM-6 is engineered with an "active seeker," meaning it can send an electromagnetic targeting "ping" forward from the missile itself - decreasing reliance on a ship-based illuminator and improving the ability to fire multiple interceptor missiles simultaneously.

Unlike an SM-3 which can be used for "terminal phase" ballistic missile defense at much farther ranges, the SM-6 can launch nearer-in offensive and defensive attacks against closer threats such as approaching enemy anti-ship cruise missiles. With an aerial sensor networked into the radar and fire control technology such as an E2-D Hawkeye surveillance plane or F-35, the system can track approaching enemy cruise missile attacks much farther away. This provide a unique, surface-warfare closer-in defensive and offensive weapons technology to complement longer range ship-based ballistic missile defense technologies.

Once operational, this expanded intercept ability will better defend surface ships operating in the proximity or range of enemy missiles by giving integrating an ability to destroy multiple-approaching attacks at one time.

NIFC-CA is part of an overall integrated air and missile defense high-tech upgrade now being installed and tested on existing and new DDG 51 ships called Aegis Baseline 9.

The system hinges upon an upgraded ship-based radar and computer system referred to as Aegis Radar –- designed to provide defense against long-range incoming ballistic missiles from space as well as nearer-in threats such as anti-ship cruise missiles, he explained.

Developers said integrated air and missile defense provides an ability to defend against ballistic missiles in space while at the same time countering air threats to naval and joint forces close to the sea.

The NIFC-CA technology can, in concept, be used for both defensive and offensive operations, Navy officials have said. Having this capability could impact discussion about a Pentagon term referred to as Anti-Access/Area-Denial, wherein potential adversaries could use long-range weapons to threaten the U.S. military and prevent its ships from operating in certain areas -- such as closer to the coastline.

Having NIFC-CA could enable surface ships, for example, to operate more successfully closer to the shore of potential enemy coastines without being deterred by the threat of long-range missiles.

Defensive applications of NIFC-CA would involve detecting and knocking down an approaching enemy anti-ship missile, whereas offensive uses might include efforts to detect and strike high-value targets from farther distances than previous technologies could. The possibility for offensive use parallels with the Navy's emerging "distributed lethality" strategy, wherein surface ships are increasingly being outfitted with new or upgraded weapons.

The new strategy hinges upon the realization that the U.S. Navy no longer enjoys the unchallenged maritime dominance it had during the post-Cold War years.

During the years following the collapse of the former Soviet Union, the U.S. Navy shifted its focus from possibly waging blue-water combat against a near-peer rival to focusing on things such as counter-terrorism, anti-piracy and Visit, Board Search and Seizure, or VBSS, techniques.

More recently, the Navy is again shifting its focus toward near-peer adversaries and seeking to arm its fleet of destroyers, cruisers and Littoral Combat Ships with upgraded or new weapons designed to increase its offensive fire power.

The current upgrades to the Arleigh Burke-class of destroyers can be seen as a part of this broader strategic equation.

The first new DDG 51 to receive Baseline 9 technology was the USS John Finn or DDG 113. The ship previously went through what's called "light off" combat testing in preparation for operational use and deployment.

The very first Arleigh Burke-class destroyer, the USS Arleigh Burke or DDG 51, is now being retrofitted with these technological upgrades as well.

NIFC-CA technology is also being back-fitted onto earlier ships that were built with the core Aegis capability. This involves an extensive upgrade to combat systems with new equipment being delivered. This involves the integration of new cabling, computers, consoles and data distribution systems.

Existing destroyers and all follow-on destroyers will receive the Aegis Baseline 9 upgrade, which includes NIFC-CA and other enabling technologies. For example, Baseline 9 contains an upgraded computer system with common software components and processors, service officials said.

In addition, some future Arleigh Burke-class destroyers such as DDG 116 and follow-on ships will receive new electronic warfare technologies and a data multiplexing system which, among other things, controls a ship's engines and air compressors, developers said.

The Navy's current plan is to build 11 Flight IIA destroyers and then shift toward building new, Flight III Arleigh Burke-class destroyers with a new, massively more powerful radar system.

The new radar, called the SPY-6, is said by Navy officials to be 35-times more powerful than existing ship-based radar.

https://scout.com/military/warrior/Article/-F-35-Sensors-Test-Perform-Ballistic-Missile-Defense-Missions-111919506

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CNN (Atlanta, GA)

Air Force Developing Weapon That Could Disable North Korean Missiles

By Brian Todd

December 8, 2017

Washington -- With Kim Jong Un pushing aggressively to develop missiles that could hit the United States with nuclear warheads, pressure has been mounting on US officials to answer the threat. One effective countermeasure could lie in an obscure military lab in New Mexico.

It's called CHAMP, for Counter-electronics High Power Microwave Advanced Missile Project. James Fisher, spokesman for the Air Force Research Lab at Kirtland Air Force Base, said it's a high-powered microwave weapon that can be delivered on an air-launched cruise missile, deployed from an American bomber.

Fisher says the cruise missile with a CHAMP system strapped to it would fly into enemy airspace at low altitude, and send out strong pulses of electromagnetic energy. The enemy's electronic command-and-control systems would be jammed. Analysts say the cruise missile it's deployed on could then be splashed down at sea.

The Air Force says CHAMP was not developed specifically to counter the North Korean threat. But retired Gen. David Deptula, who once headed US Air Force intelligence, said the applications could be effective against North Korea.

Retired Air Force intelligence officer Col. Cedric Leighton went further, saying CHAMP could be a game-changer with North Korea.

"It would be very useful in the Korean theater because it wouldn't require the presence of significant numbers of ground forces," Leighton said. "It wouldn't require Special Operations forces. And it wouldn't require kinetic bombing attacks. ... In essence, what could happen is an attack can occur, and not a single person on the enemy side would lose a life."

Leighton said a CHAMP system could disable a North Korean missile on the launchpad or in flight.

Fisher said the Air Force tested the CHAMP system in 2012, at a testing range in Utah larger than the state of Delaware. Buildings were rigged with communications and other systems similar to what enemy militaries would have.

Mary Lou Robinson, who heads research and development of CHAMP at the Air Force Research Laboratory, told NBC News, "It absolutely did exactly what we thought it was going to do." Robinson said they had several target classes, and they "predicted with almost 100% accuracy" which systems would fail.

While CHAMP holds the promise of a nonlethal weapon against the North Koreans, skeptics say it has potentially dangerous drawbacks.

"The North Koreans would see many of these missiles flying in," says Jeffrey Lewis, an adjunct professor at the James Martin Center for Nonproliferation Studies at the Middlebury Institute of International Studies at Monterey. "They would try to shoot them down. They're not actually going to know that they're armed with high-powered microwaves instead of, say, conventional explosives or even nuclear weapons."

CHAMP weapons are not currently operational. Neither Fisher, Robinson, nor other Air Force officials would say when the weapons could be deployed. But Leighton said in a crisis, "The CHAMP system could be deployed within days."

http://www.cnn.com/2017/12/07/us/air-force-champ-north-korea-missiles/index.html

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US ARMS CONTROL

Financial Times (London, United Kingdom)

US Says It May Restart Intermediate Nuclear Missile Development

By Demetri Sevastopulo and Kathrin Hille

December 10, 2017

The US has warned Russia that it will start developing new nuclear missiles unless Moscow returns to compliance with an arms control treaty it is accused of breaching.

US officials said Donald Trump wanted to remain in the Intermediate Range Nuclear Forces (INF) treaty but would not accept Russia continuing to flout the 1987 accord.

"What we have decided to do is take the middle-ground option that they have enjoyed . . . to have their cake and to eat it . . . off the table," said one US official.

Washington has accused the Kremlin of breaching the INF treaty, which bans the possession, production or flight testing of nuclear-armed cruise and land-based nuclear ballistic missiles with a 500km to 5,500km range. General Paul Selva, the vice-chairman of the US joint chiefs of staff, in March told Congress that Russia had deployed a new cruise missile that contravened the INF.

Mr Trump's national security team had decided that the US would not take actions "at this point" that would breach the INF, the official said.

In addition to researching modifications to existing weapons and developing new systems, the US would impose restrictions on Russian companies that produce the Novator 9M729 missile, according to officials. But they stressed that Mr Trump wanted to save the treaty, and would reverse the measures as soon as Russia returned to compliance.

"The possibility of the treaty falling apart is inherent . . . in the approach that we're taking," said the official. "We do not intend to remain bound, if they refuse to be bound, but our sincere hope is that we end up both being bound."

US and Russia will this week convene a meeting of the "special verification commission" that was created to ensure compliance with the INF. One of the US officials said Washington had decided to increase the political pressure on Russia because it had not responded to "shame remedies".

Russia has remained steadfast in its denials of having breached the treaty. Sergei Ryabkov, the Russian deputy foreign minister, at the weekend said the US claims were "absolutely unsubstantiated". The Russian foreign ministry said Moscow was "ready to engage in a non-politicised, professional dialogue" but that attempts to impose "ultimatums or to put military and political pressure on Russia through sanctions . . . are unacceptable."

Moscow, in turn, has accused Washington of violating the treaty arguing that US missile defence systems in Romania — which are also scheduled for deployment in Poland next year — could be used to launch Tomahawk medium-range missiles. Konstantin Kosachyov, head of the foreign affairs committee of the Federation Council, Russia's upper house of parliament, said the Aegis Ashore system was "in gross violation of the INF treaty".

A second US official said Aegis Ashore did not violate the treaty because it was "not capable of launching a cruise missile". He also rejected the Russian claim that tests of rockets for missile defence systems breached the treaty because, he argued, they were explicitly permitted.

Russia has also alleged that armed UAVs (unmanned aerial vehicles) violate the treaty — another claim that the US dismisses. "They are round trip systems . . . not one-way missiles," said the US official. "They deliver a missile, but they are not a missile."

Viktor Bondarev, chairman of the Russian Federation Council's defence committee, said Russia would equip its military with "more powerful weapons within a very short time" if the US abandoned the INF.

Arms control experts have long warned of the potential for exactly that kind of dangerous escalation. Douglas Barrie, an analyst at the International Institute for Strategic Studies, said symmetric responses, such as a Congressional push to allow the US development of a ground-launched cruise missile if Russia failed to return to compliance with the treaty, were the poorest policy choice for Washington.

Mr Barrie wrote in October that if the US developed a ground-based cruise missile, and Russia continued to deny a breach, "it would provide [Russian president Vladimir] Putin a propaganda victory and a 'legitimate' reason to blame the US for the collapse of the INF Treaty".

Moscow said a collapse of the treaty would greatly raise international security threats and spell doom for an extension of the new Start treaty due next year. But some Russian analysts say a breakdown of the INF deal would benefit Moscow.

Russia has long complained that the treaty was to its disadvantage. In 2007, Sergei Ivanov, then defence minister, said it had been a "big mistake". Mr Putin himself in 2013 called the Soviet Union's decision to sign it "debatable to say the least."

"It would have been good for Russia to get out of [the treaty] a long time ago. If the Americans do this for us, I would say thank you very much," said Alexander Khramchikhin, deputy director of the Institute of Political and Military Analysis.

Mr Khramchikhin said Russia needed medium-range cruise missiles more than the US, since several nations on its southern fringe, including China, Pakistan and Saudi Arabia, stepped up deployment after Moscow destroyed theirs under the INF treaty.

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Arms Control Today (Washington, DC)

Triggers, Redlines, and the Fate of the Iran Nuclear Accord

By Richard Nephew

December 2017

Following President Donald Trump's decision no longer to certify that the Iran nuclear accord is in the U.S. national security interest, the conversation in Washington has focused on what Congress can and ought to do next.

Given the centrality of the issue of when certain restrictions on Iran's nuclear activities expire under the accord, there is a possibility that Congress will seek to pass legislation to address the perceived problem by attempting to unilaterally change the terms of the 2015 agreement. Republican Senators Bob Corker (Tenn.) and Tom Cotton (Ark.) said they would introduce legislation that creates triggers or redlines for the automatic snapback of U.S. sanctions suspended pursuant to the agreement, known officially as the Joint Comprehensive Plan of Action (JCPOA), although there is a chance that they will hold off moving forward for some time due to lack of support.

These triggers or redlines could be simple (e.g., focused on uranium centrifuge numbers) or complex (e.g., related to stages of ballistic missile development). Yet, the concept is the same across the board: manage the political problem of a president who campaigned against the nuclear agreement having to validate Iranian compliance, which is occurring, while devolving responsibility for the response to that compliance away from the chief executive and legislative branch to a set of "dead man's switches."

Separate and apart from the wisdom of this approach, discussion of such options misses the real point concerning Iran and the challenge if Iran's nuclear program expands in the future. The central challenge is not in figuring out how the United States could respond in such a scenario; it is in ascertaining how best to achieve the goal of preventing Iran's nuclear program from expanding in the first place. In legislating on the topic of nuclear redlines and Iranian sunsets, Congress may be able to cobble together a framework for managing the U.S. policy response. By doing so, however, Congress might eliminate any chance for negotiations with the Iranians to arrest this problem. In fact, legislating on Iranian behavior without any thought as to how Iran will actually be convinced to agree is not only somewhat pointless, it is also counterproductive in the extreme.

The Trouble With Triggers

To start, it is worth reviewing the text of existing U.S. law, the Iran Nuclear Agreement Review Act of 2015 (INARA). In essence, it lays out the process whereby the JCPOA would be evaluated by Congress for its suitability and then enforced into the future. Congress was not entirely clear as to what would be involved in the JCPOA, as specific provisions were still under negotiation with the Iranians and U.S. partners in the P5+1 (China, France, Germany, Russia, and the United Kingdom) when the legislation passed. Nevertheless, as a result of extensive briefings provided by the Obama administration, Congress had a decent idea that the agreement would involve U.S. and UN Security Council sanctions relief being traded for Iran accepting restrictions on its nuclear program, as well as additional monitoring and transparency.

Congress therefore gave itself a broad mandate to review the JCPOA and its constituent parts and the president a broad obligation to confirm on a regular basis that Iran was living up to its responsibilities under the deal. The result was a series of reporting requirements imposed on various parts of the U.S. executive branch and intelligence community, as well as the quarterly

certification requirement that Iran was complying with its obligations and that sanctions relief under the JCPOA was in the U.S. national security interest. It is this latter point that the president has now refused to certify.

The rest of that law, however, is constructed as a way of signaling to Iran what would happen if it were to cheat on its obligations and to simplify the process of mounting that response. The concept is that a sanctions snapback strategy might be required if Iran starts to break out of its nuclear restrictions and that it would be prudent for that process to be as expedient as possible. Congress therefore defined cheating in broad terms, speaking of "material breaches," "compliance incidents," and even "potentially significant breaches."

Congress wisely left the determination of what constitutes what in the hands of the president and the executive branch, requiring information about any such problems but avoiding prescription. Congress even acknowledged the possibility that a breach or compliance issue might arise but be "cured" by Iran, noting in essence that mistakes or provocations were to be expected during the JCPOA and that flexibility ought to be afforded to the president and his diplomats to fix them.

By discussing redlines and triggers, Congress may undo this effective and prudent setup to our collective detriment. First and foremost, if drawn tightly, such redlines and triggers could create unwarranted and unnecessary crises with Iran even where fundamental risks from the nuclear program are not present. Triggers and redlines are intended to serve as a forcing function in which A automatically results in B. For example, a redline may be drawn that Iran may not possess more than 300 kilograms of enriched uranium in forms other than fuel in perpetuity. If the amount of enriched uranium was reported at 301 kilograms, although this has no significance from the perspective of weapons breakout, the result would be the same as if Iran possessed 1,000 or 10,000 kilograms of enriched uranium in the same form: snapback of U.S. sanctions and likely a confrontation with Iran. At the same time, if the decision is made to have a redline that is looser than the underlying JCPOA requirement, say, a redline at 350 kilograms rather than 301, then the approach opens up areas of "acceptable" marginal behavior, giving Iran the impression that it can play within the range of 300-350 kilograms.

Some may argue that this is precisely why a tight trigger ought to be agreed, to stop Iran from playing games on the margins of the JCPOA. Proponents of this strategy might note that Iran played such games on heavy-water production in 2016, edging just over the permissible threshold of heavy-water possession on two occasions, and that it is precisely this kind of behavior that merits prevention. The theory goes that if Iran sees a tight trigger, it will be dissuaded from testing the fences that ring it in the JCPOA.

But, there are few scenarios in which a numerical benchmark is obtainable. Many of the issues in the JCPOA depend on interpretation of data where there may be no consensus or no judgment. On transparency and verification, for example, throughout the JCPOA, the International Atomic Energy Agency (IAEA) is called on to conduct inspections and complementary access visits in order to verify various aspects of the agreement. As a matter of logical necessity, it is up to the IAEA to make the call as to whether it assesses Iranian compliance with those elements or not. Member states can object to the IAEA assessment and render their own verdicts, but this too is a subjective appraisal. It is impossible, therefore, to have a trigger attached to such access that is immune from interpretation unless it is so mundane as to be meaningless (e.g., numbers of inspector visits).

This opens up another problem: what happens if part of the JCPOA is not captured under an explicit trigger? Just as with the concept of a 350-kilogram limit on enriched uranium, any indication given to Iran that some provisions are less important than others could convey an unhelpful signal to Iran that noncompliance in one area would be treated differently than noncompliance in another. Even if a catchall provision were to be retained, the damage might still be done, as it is human nature to

take signals from perceived prioritization. After all, laws are written to forbid specific crimes rather than to encourage people to behave as good citizens.

Last but not least, if a trigger and redline approach operates as intended, then it eliminates the opportunity for diplomacy and negotiation in managing incidents that might emerge. Automaticity in the design of snapback means by its very definition that once an assessment of noncompliance is made, there would be limited opportunities for the Iranians to make redress. Presumably, they could do so before such a determination was reported to Congress, although this would create all the same problems as under the present system and as outlined above with respect to a more flexible interpretation of noncompliance.

After that, unless there is significant leeway accorded to the president on enforcement of snapped-back sanctions, which would reduce the credibility of threat itself, the die would be cast. This might be fine if the intent is to police behavior without concern for the consequences of violations, but it is worth underscoring that it is not in the interest of the United States for there to be violations in the first place. The entire basis of the accord was that the imposition of consequences for Iran's violations of its obligations was less valuable than a resolution of the underlying nuclear problem with Iran. That would not necessarily be the case with a less flexible approach.

In all of this, an analogy with U.S. nuclear strategy in the 1950s and 1960s may be warranted. Advocates of the trigger and redline approach lament the flexible response arrangements of the present, but it is not apparent that going to a "massive retaliation" strategy would accomplish much more than raising real risks of a rapid and unintended escalation into a crisis with Iran.

Of course, some advocates of triggers and redlines have underscored that their interest is not necessarily in going after Iran today but rather laying out a set of requirements on Iran for the future. This trigger and redline approach would be potentially different because it would not be intended to resolve implementation problems but rather to police Iranian behavior after Iran's affirmative obligations under the JCPOA start to lapse.

In this conception, the redlines and triggers would not really come into play until such time as Iran's nuclear program begins to change and expand toward the later years of the JCPOA restrictions, or roughly 2023 forward. Options could include things such as a decision to snap-back sanctions if Iran fields advanced centrifuges in greater numbers than research and development scale starting in 2028 or a decision to reimpose sanctions if Iran declined to source its future power reactors from foreign vendors, instead preferring to build and fuel its own.

From a nonproliferation perspective, both of these Iranian steps are objectionable in their own ways. Other examples of potentially problematic Iranian nuclear activities that could occur as restrictions lapse abound, such as a decision by Iran to restart R&D on spent fuel reprocessing or the production of uranium enriched to a level higher than 3.67 percent U-235. For this reason, it is in the U.S. interest to avoid these outcomes and to work to prevent these developments.

The Matter of Iranian Honor

Those inclined to pursue a redline and trigger approach appear to believe that the most effective way forward is to threaten Iran into cooperation. They are arguing implicitly that an Iran that knows the potential consequences of its activities is an Iran that will stay meekly in its box, abiding by foreign-imposed restrictions.

Unfortunately, that is not likely to take place. Iran's very core identity is that of a revolutionary state that resists the imperialistic tendencies of the West and those of the United States in particular. This identity was forged in the resentments that were engendered in a history of colonialism and foreign power domination, most recently experienced in the U.S. and UK-assisted coup against Iranian

Prime Minister Mohammad Mossadegh in 1953 and in the predatory oil investment arrangements that Iranians felt were foisted on them throughout the 20th century.

Taking aside completely whether a U.S. decision to impose penalties against Iran for nuclear activities that, to a certain extent, were determined to be acceptable in the JCPOA would be a violation, the simple reality is that an overt imposition of obligations on Iran from the outside is the completely wrong way to start this conversation with Iran. Throughout the 2002-2015 period, when various attempts at negotiation with Iran were made, the Iranians were unambiguous about precisely one thing: they would not accept any arrangement in which they were forced to obey the demands of an outside power.

The Iranian system imposed this constraint, and Iranian negotiators observed it religiously. It is this reason, for example, that the JCPOA and the Joint Plan of Action (JPOA) that preceded it included so many references to Iran undertaking voluntary actions or making a decision as to what it would do. The legal impact of these decisions was the same as a prohibition, but the phrasing was an essential element of getting Iran to agree.

U.S. negotiators were confronted with this challenge early on in the JPOA's restrictions on its enrichment plants and the Arak heavy-water reactor. The United States wanted to have a concrete requirement on Iran not to expand its enrichment plants or to construct the reactor, which would be capable of producing weapons-usable plutonium. Iran would not agree to such blunt language. In the end, the United States agreed to accept a statement that "Iran announces that it will not make any further advances of its activities at the Natanz Fuel Enrichment Plant, Fordow, or the Arak reactor, designated by the IAEA as IR-40." The United States then used IAEA inspector access and U.S. intelligence resources to verify that this announced intention was observed.

The result was that Iran was able to frame its commitment in its own way, and the United States got the desired end result. Proponents of a trigger and redline approach might argue that they too would be fine with such an outcome and that their concept would not inherently preclude Iran making a similar declaration in the future. Yet, by framing the very discussion of this approach as coercing Iran's future behavior, Congress would nonetheless feed into the internal deliberations in Iran as to why it would be taking or, more likely, forgoing nuclear steps in the future. This would make the jobs of those future Iranian leaders more difficult if not impossible, especially if the next few years involve a more general increase in tensions between the United States and Iran.

An important difference must be made between legislating what the United States wants and getting what the United States wants. Congress naturally has the ability under the U.S. Constitution to set conditions for what the U.S. executive branch can offer insofar as sanctions relief is concerned or even what would constitute an acceptable policy toward Iran. Historical precedent has tended to accord a president latitude in implementing his own foreign policy, which Congress has largely respected. Yet, Congress cannot legislate what a foreign government will do, only what the United States will do in response. The problem therefore emerges: how to get Iran to sign on to U.S. requirements and preferences.

The prevailing theory of the redline approach is that the threat of overwhelming U.S. sanctions pressure will be sufficient. This is a dubious proposition. U.S. sanctions prior to the 2013 JPOA were hardly light in touch, driving the Iranian economy into recession and depriving it of more than $50 billion in oil revenues in 2012 alone. Some have argued that Iran would have accepted deeper concessions in JCPOA negotiations had sanctions not been held back in 2013, but this is at best conjecture and speculation, if not wishful thinking. This author's own assessment is that sanctions had delivered as much pressure as was going to be achievable and that they were a wasting asset.

Either way, the sanctions pressure was able to bring Iran along only so far, and bringing more to bear would require not only snapback but far deeper sanctions against Iran. Given international hesitancy to support the Trump administration approach, it is a purely hypothetical exercise to suggest that even snapback would be effective, much less obtaining the comprehensive global embargo against Iran that would be necessary for a sanctions-focused strategy to have even a chance of succeeding.

Getting the Best of Both Worlds

As was hinted in the description of what Iran accepted in JPOA language, the right answer is to get Iran to believe it is in its own interest to take the required steps and to be able to sell the result at home. This requires more tact and diplomacy and less rigid demands from the outside, but has the hope of creating actual solutions with Iran and a more sustainable agreement to boot.

To start, Congress should not change the approach of a flexible response to compliance standards embodied in INARA, and it should not adopt rigid redlines to manage Iran's future nuclear program. Instead, Congress should maintain its more general view of how Iranian compliance under the JCPOA should be judged and should outline the broad strokes of U.S. priorities for future negotiations with Iran.

Congress can offer legislation that mandates reimposition of U.S. sanctions against Iran long into the future if evidence emerges that Iran is once again violating its nonproliferation commitments or that the IAEA is unable to provide assurances as to the absence of undeclared Iranian nuclear activities after the JCPOA's expanded verification requirements end. This would be the establishment of a redline but one sufficiently distant and broad so as to permit latitude for executive branch performance. Alternatively and preferably, Congress can simply wait to see what happens, content in the knowledge that a massive snapback of sanctions remains a U.S. policy option in perpetuity, provided there is adequate cause and scope.

Privately, Congress can register with the administration its views as to what would constitute sufficient measures for a long-term arrangement, charging the administration to seek negotiations with Iran and other U.S. partners in its pursuit. The administration can define core elements for such an arrangement, prioritizing those measures that would provide expanded confidence as to Iran's nuclear intent, and then seek a variety of ways for bringing them about. These could include enhancements to the IAEA's standard safeguards practices, improved global export controls, regional arrangements, and even a direct agreement with Iran.

Such a strategy would not generate immediate headlines nor would it satisfy the visceral desire on the part of some to see Iran acquiesce to the demands of the United States. Yet, it might just have a chance of securing the kind of steps and commitments on Iran's part that would be necessary to convert the JCPOA into a longer-term, more sustainable nonproliferation instrument.

https://www.armscontrol.org/act/2017-12/features/triggers-redlines-fate-iran-nuclear-accord

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The Economist (London, United Kingdom)

Russia is Undermining a Symbol of Cold-War Diplomacy

Author Not Attributed

December 9, 2017

The Intermediate-Range Nuclear Forces treaty is unravelling

THIRTY years ago, Ronald Reagan and Mikhail Gorbachev signed the Intermediate-Range Nuclear Forces (INF) treaty, banishing an entire category of destabilising weapons from Europe. Some 2,700 ground-launched ballistic and cruise missiles with ranges between 500 and 5,500 km were destroyed in a deal that presaged the end of the cold war. Yet today the treaty is imperiled by Russian violations. If those do not cause it to collapse, the response America is contemplating may.

America first announced its concerns over Russian violations in 2014, a few months after Vladimir Putin annexed Crimea. The treaty obliges both countries not to possess, "produce or flight-test" new intermediate-range ground-launched missiles. Russia, the Americans said, had tested a cruise missile that breached that agreement. No countermeasures were proposed, apparently in the hope that the Russians would be embarrassed into quietly abandoning the new system.

The Russians denied the charge, though they had been complaining about the treaty for years, saying it blocked them from deterring new missile powers. (China, India, Pakistan, North Korea and Israel, they noted, all have intermediate-range missiles.) Another reason why America hesitated to retaliate was that it was focused on deploying new troops to NATO's eastern members, who were worried by Russia's intervention in Ukraine. The threat to the treaty was seen as a slow-burn problem that could be addressed later.

That time appears to have come. In February Donald Trump's administration revealed that Russia had secretly begun deploying the new missile, known as the SSC-8, a ground-launched variant of the 3M14 naval cruise missile used on targets in Syria two years ago. The SSC-8 can be moved by road and has a range of 2,500 km. The Russians have two operational battalions, each with about 36 missiles. One is thought still to be at the Kapustin Yar test site near Volgograd, the other at a base in the central military district that puts it in range of targets across Europe.

The Trump administration is expected to publish its Nuclear Posture Review early next year, which will guide its nuclear weapons policy. Officials are seeking ways to bring Russia back into compliance with the treaty rather than walking away from it. But some in the administration are sceptical about all arms-control agreements, and the INF treaty in particular. Last month Congress authorised the Pentagon to spend $58m on a response. The plan includes initial development of a new American intermediate-range missile. That would not breach the treaty, but most arms-control experts regard it as a step in the wrong direction. Producing such a missile would take many years and cost billions of dollars that the Pentagon can ill afford. The effort to persuade European members of NATO to host the missiles would divide the alliance, and the Russians could claim that not they, but the Americans, had blown up the treaty.

Steven Pifer, a former arms-control negotiator at the Brookings Institution, a think-tank, says that it makes no sense to give Mr Putin exactly what he wants. He reckons there are better ways to put pressure on Russia. One would be deploying existing air- and sea-launched cruise missiles to Europe and nearby waters. B-1 strategic bombers armed with stand-off missiles could be stationed at Fairford, an American base in Britain. Submarines carrying cruise missiles might turn up on patrol in the North Sea. Mr Pifer also thinks it is high time that America's European allies, in particular France and Germany, criticised the Kremlin's behaviour, which is a threat not just to the treaty but to them.

It may be too late to save the INF treaty, but it is worth an effort. If the treaty dies, the prospects for extending the New START strategic weapons deal, which will otherwise expire in 2021, will be dim. So will the future of nuclear-arms control itself.

https://www.economist.com/news/europe/21732140-intermediate-range-nuclear-forces-treaty-unravelling-russia-undermining-symbol

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Deutsche Welle (Bonn, Germany)

US, Russia Missile Treaty in Jeopardy as Tensions Escalate

By Chase Winter

December 9, 2017

A landmark Cold War-era nuclear arms control treaty between the United States and Russia is at risk of collapsing. A tit-for-tat escalation could endanger security, divide NATO and undermine arms control agreements.

The United States is ratcheting up pressure on Russia over alleged violations of a Cold War-era nuclear arms control treaty banning intermediate-range missile systems.

The Obama administration in 2014 first accused Moscow of producing and testing a new ground-launched cruise missile in violation of the Intermediate-Range Nuclear Forces Treaty (INF Treaty).

In March this year, General Paul Selva, the vice chairman of the Joint Chiefs of Staff, accused Russia of actually deploying the missile system, saying it was meant to threaten NATO facilities. In November, a top Trump administration official publicly identified it as the Novator 9M729 missile, or NATO-designated SSC-8.

The 1987 treaty signed between President Ronald Reagan and Soviet leader Mikhail Gorbachev bans Russia and the United States from possessing, producing or conducting test flights of ground-launched cruise missiles and ballistic missiles with a range of 500 to 5,500 kilometers (310 to 3,420 miles). It allows sea-based and air-delivered missiles at those ranges. The INF treaty resulted in the destruction of an entire class of conventional and nuclear-capable missile systems, boosting security toward the end of the Cold War.

Russia has repeatedly denied US accusations, countering that the United States is violating the treaty in three ways. The main accusation relates to the United States deploying the ground-based Aegis anti-missile system in Europe, something Washington has refuted by arguing it is a non-offensive, anti-ballistic missile defense system.

Trump administration outlines strategy

In a considerable escalation of a simmering dispute, the Trump administration is now "pursuing economic and military measures intended to induce" Russia to comply with the INF Treaty, the State Department said in a statement on Friday marking the 30th anniversary of the treaty.

"This includes a review of military concepts and options, including options for conventional, ground-launched, intermediate-range missile systems, which would enable the United States to defend ourselves and our allies, should the Russian Federation not return to compliance," said the statement, outlining the Trump administration's strategy for the first time. "This step will not violate our INF Treaty obligations."

The State Department said it was prepared to "cease such research and development activities" if Russia fully complies with its INF Treaty obligations.

Research and development of ground-launched intermediate-range missiles is not a violation of the treaty, "but going down this road sets the stage for Washington to violate the agreement at some point and it takes the focus off of Russia's INF violation," Daryl G. Kimball, the executive director of the Arms Control Association, said in a statement after the US announcement. "Rather than persuading Russia to return to compliance, this action is more likely to give Moscow an excuse to continue on its current course."

Responding to the United States on Friday, Russia's Foreign Ministry said it was committed to keeping the INF Treaty alive but that the "the language of ultimatums" and threats was unacceptable.

Technical and legal questions

The US and Russian statements come as Washington called a meeting on December 12-14 of the Special Verification Commission (SVC), a technical body designed to address compliance issues. The SVC met last November over the same issue without a resolution.

The accusations against Russia involve complex technical and legal aspects of the INF Treaty.

The details of the alleged violations the United States has presented to Russia are still unclear. From what is known, "it is not like a smoking gun in the sense that a violation might be indirect," Pavel Podvig, the director of the Russian Nuclear Forces Project, told DW.

He added that it appears that the United States has fairly strong evidence or is fairly confident of a violation, but at the same time that Russia may be able to maintain a degree of plausible deniability. According to Podvig, a likely scenario is that the 9M729 is almost the same as a sea-launched Kalibr missile observed to have been tested at INF range.

Few good options besides returning to compliance

The United States is trying to rally its NATO allies to take punitive measures to force Russia to comply with the INF Treaty. Germany's Der Spiegel reported that US Defense Secretary James Mattis issued an ultimatum to a meeting of NATO defense ministers in Brussels last month when he presented evidence of Russian violations.

He reportedly said the alliance must come up with a common response to get Russia to comply with the INF Treaty by next summer's NATO summit; otherwise, the United States would go it alone.

The Trump administration and Defense Department are under pressure to respond. The US Congress in its 2018 Defense Authorization Bill mandated the research and development of mobile ground-based intermediate-range cruise missile launchers and "a report on the cost, schedule, and feasibility to modify existing and planned missile systems."

Some experts criticize this approach, arguing that it would be costly, militarily unnecessary, divide NATO and ultimately be ineffective.

"The US, and to some extent in NATO, may be overestimating the power of pressure on Russia today," Podvig said.

Land-based missile systems today provide only a marginal capability, unlike during the potential conflict scenarios during the 1970s and 80s. Both sides are already allowed to possess sea and air-launched missiles at INF range.

"US forces are already stocked with formidable air- and sea-launched missiles that can cover the same targets. Furthermore, a new US INF missile would take years to develop and cost billions of

dollars that would drain funding from other military programs," Kimball of the Arms Control Association wrote.

Threat to other arms control agreements

Perhaps more importantly, even if the United States deployed land-based intermediate-range missiles in Europe, there is no political appetite among European countries to host them, let alone a nuclear-capable system.

"Russia could have its own missiles with nuclear warheads and Moscow certainly understands that there is no way NATO will deploy new nuclear systems in Europe; there is just no country that will take it," Podvig said. "It would divide and break the alliance."

The collapse of the INF Treaty or continued mutual allegations without a resolution threaten to undo trust around other bilateral arms control agreements.

As Mattis said at his Senate nomination hearing, it is in the US' best interest to return Russia to compliance, otherwise it "could erode the foundations of all current and future arms control agreements and initiatives."

A breakdown of the INF Treaty could take the focus away from and undermine the 2010 New Strategic Arms Reduction Treaty. That strategic nuclear missile arms control agreement must be extended through US-Russia agreement by the treaty's expiration in 2021.

http://www.dw.com/en/us-russia-missile-treaty-in-jeopardy-as-tensions-escalate/a-41728253

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ASIA/PACIFIC

The Times of Israel (Jerusalem, Israel)

For Israelis in Japan, the North Korea Nuclear Situation Is Business As Usual

By Cnann Liphshiz

December 11, 2017

Israelis may relativize the North Korea threat, but expat Americans are concerned about their futures in the demilitarized country

TOKYO (JTA) — Outside this city's largest synagogue, a wailing siren drowns out the sounds of traffic.

The cacophony alarms a boisterous group of students headed to the nearby United Nations University. Fearing an earthquake, they instinctively run into the middle of the small street in the busy, upscale neighborhood of Shibuya.

But they relax and giggle nervously when they realize that the siren emanating from the Shiritsutokyojogakkan Elementary School, opposite the synagogue, has nothing to do with seismic activity. Rather it is part of a nationwide series of drills designed to ready the population of this island nation in the event of a missile attack by its bellicose nuclear neighbor, North Korea.

"We really are not prepared for this," Riku Yushin, a post-doctorate student who was standing outside the Jewish Community of Japan Conservative synagogue, told JTA in October.

"Unlike you," he said of Jews, "we're not used to this sort of thing here in Japan. We worry only about earthquakes."

Yushin may be partially right about the Jewish community's relatively blase attitude. Japan's Jews form an eclectic group of several hundred people, with sizable American and Israeli contingents. And perhaps not surprisingly, the many Israelis living here — raised in a climate of constant security threats — are pooh-poohing North Korea's escalating military provocations. (The latest happened last week: For the second time this year, Pyongyang test launched a missile that landed inside Japan's territorial waters.)

But it's a different story for the American Jews living in Japan. They say they find the threat deeply disturbing, especially in a country that has served as a safe haven for Jews for the past 150 years.

Israelis may relativize the North Korea threat with memories of Iraqi Scud missiles raining down around their homes, but it's "very hard" for Americans "when the Tokyo city government tells us that if there's a nuclear attack, we'll have about five minutes to go into the basement," said David Kunin, the synagogue's New York-born rabbi.

Israelis are accustomed to hearing Prime Minister Benjamin Netanyahu say Iran may bomb Israel with nuclear weapons, "even if that's not immediately true," he said, noting that Iran does not actually have nuclear weapons.

By contrast, the threat to Japan is concrete and potentially immediate. Plus, adding to the mood of anxiety is the recent decision by several local governments, including in the Tokyo area, to hold drills at schools. It may be necessary, Kunin said, but it's especially stressful for parents and children.

In Israel, schoolchildren are regularly drilled in procedures in the event of an attack. They practice evacuating classrooms quickly and calmly into on-campus bomb shelters that are equipped to protect against chemical weapons attacks. These drills often have a lighthearted approach — many students relish the activity as a welcome break from the school routine.

But in Japan, such drills — combined with constant news about the North Korea threat — are making "people feel very worried" in a country without an army, said Hidetaka Muto, a Tokyo father of three who works as the right-hand man for Binyomin Edery, one of the city's two Orthodox rabbis.

Also, unlike Israel, Japan largely lacks the infrastructure to protect the population in the event of an attack. For example, at the Kamimatsuyama Elementary School in Sakura, a city located 75 miles north of Tokyo, a recent drill entailed faculty and pupils running across the yard to the sound of a siren and the words "Missile launched! Missile launched!" In the yard's center, the students squatted low with arms covering their heads.

"We haven't got a nuclear shelter or even strong buildings, so this is all we can do," Nakamura Takashi, an official of Sakura City who helped to organize the missile defense drill, told Time magazine in September.

"The government says you have a much higher survival rate if you crouch rather than stand up," he added.

Because of Japan's history as the only nation that was attacked with nuclear weapons, the North Korea threat plays upon nightmares that remain very much alive in the national consciousness. Japan's defeat in World War II, following the nuclear bombing by the United States of Hiroshima and Nagasaki, left its society with a nuclear trauma reinforced in movies, comic books and popular culture, Muto explained.

"So it's particularly disturbing to come again under this threat for the first time in almost 80 years," he said.

By contrast, the rabbi's wife, Efrat Edery, who was born in Israel and, at 40, has nine children, isn't particularly worried.

"What, the North Korea thing?" she said. "I see it on the news but, to tell you the truth, I'm not really concerned. I think it's all talk and I don't get the feeling that Japanese people around me are particularly worried about it, either."

Lior Pasternak, an Israeli father of two from the western city of Izumiotsu, which is located just 500 miles from North Korea's southern border, was equally dismissive.

"I'm pretty sure this posturing by North Korea will not lead to violence because even the loudmouth in Pyongyang doesn't want to mess with Donald Trump," he said in reference to dictator Kim Jong-un and America's president.

"Besides," added Pasternak, a former combatant in the Israeli armored corps, "for a Jew and an Israeli, it's never a good idea to get frightened by threats, or we would have to leave or freak out pretty much everywhere we live."

Yet Japan is precisely one of a handful of places where Jews had been able to live threat-free lives — including during the Holocaust. Jews came to this country for its safety and opportunities shortly after Japan ended its policy of isolation in the latter half of the 19th century, according to Shmuel Vishedsky, the rabbi of Kobe. His city near Izumiotsu, in Japan's west, was one of the first places where Jews settled here.

Kobe, a bustling port city that is favored by many Western expats, is home to Japan's oldest Jewish place of worship, which began in the early 1900s. The city's synagogue, Ohel Shelomoh, was built in 1970 atop the storage basement where the first Jewish settlers from Eastern Europe used to pray. With its wooden decor that marries Jewish and Japanese symbols, it is also one of the country's prettiest, attracting non-Jewish visitors from across Japan to the resident congregation of some 100 Jews.

The city's earliest Jewish settlers came here to flee persecution in Eastern Europe and explore the potential of the newly opened market, Vishedsky said. And they remained protected throughout WWII, when their brethren were butchered in their home countries.

In fact, Japan is the only member of the pro-Nazi Axis powers whose Jewish population grew during the Holocaust. That's largely thanks to Chiune Sugihara, a Japanese diplomat who in 1941 was serving in Lithuania. In defiance of his superiors' orders, he issued visas to thousands of Jews who thus were able to flee the advancing Nazis and survive the war in Japan and its occupied areas in China.

Despite this new threat from North Korea, Jews can still feel safe in Japan, according to Moshe Gino, a member of the Kobe Jewish community who settled here in the 1990s and has two children with his Japanese wife, who converted to Judaism.

"That's a constant," he said.

https://www.timesofisrael.com/for-israelis-in-japan-the-north-korea-nuclear-situation-is-business-as-usual/

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The New York Times (New York, NY)

North Korean Submarine Missile Threat Prompts U.S.-Led Military Drills

By Gerry Mullany

December 11, 2017

HONG KONG — Amid fears that North Korea is rapidly developing its submarine-launched ballistic missile technology, the United States, Japan and South Korea are teaming up for a drill to track such hard-to-detect missiles, military officials said Monday.

The drill is taking place over two days in waters between Japan and the Korean Peninsula, said South Korea's Joint Chiefs of Staff, and will involve destroyers from the three nations doing computer-simulated training to track submarine missile launchings by North Korea.

The drills come in the wake of news reports that North Korea is making progress developing submarine-launched ballistic missiles, or SLBMs. The website 38 North, based at the U.S.-Korea Institute at Johns Hopkins University, obtained images of cylindrical objects, evidence that "suggests construction of a new submarine" at a facility on North Korea's east coast.

Any North Korean capability to field submarine-launched ballistic missiles in open waters would be particularly worrying for the United States and its allies, since such missiles are hard to detect before launching. In August 2016, North Korea successfully tested such a missile from near its submarine base in Sinpo, sending it 310 miles toward Japan in a launch that came after several failed tests.

The military maneuvers come a week after the United States and South Korea began holding joint drills that included flyovers of advanced stealth fighters and B1-B Lancer bombers over the Korean Peninsula, exercises that led North Korea to accuse the United States of pushing the region "to the brink of nuclear war."

To step up pressure, South Korea on Monday imposed a new round of sanctions on 20 North Korean groups and 12 individuals. The sanctions, an effort to curtail North Korea's missile and nuclear weapons programs, were imposed in retaliation for the North's launching of a missile in late November that experts said was capable of hitting much of the continental United States.

Separately, Nikki R. Haley, the American envoy to the United Nations, said over the weekend that the United States would send a full delegation of athletes to the Winter Olympics in South Korea in February. Her remarks on "Fox News Sunday" came days after she sowed doubt about participation in the Games by saying it was an "open question" whether American athletes would participate, given the tensions on the Korean Peninsula.

https://www.nytimes.com/2017/12/10/world/asia/north-korea-submarine-missile.html

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APPS Policy Forum (Canberra, Australia)

Missiles and Missile Defence in a Nuclear Asia

By Stephan Fruhling

December 12, 2017

The US and its allies need to look beyond ballistic missile defence to manage missile threats in Asia

Today, China has the ability to conduct a large-scale, conventional missile strike against the US and its allies. This carries the real risk that the Chinese army might think it can brief its political masters with a plausible theory of victory. Stephan Frühling assesses the possibilities in this chapter from Nuclear Asia, the new publication from the ANU College of Asia & the Pacific.

For much of the atomic age, intercontinental-range ballistic missiles (ICBMs) have been the epitome of nuclear arsenals in popular imagination and in the policies of many states seeking to join the nuclear club. Threatening the certainty of immediate destruction of an adversary's homeland, ICBMs more than any other weapon are associated with the condition of mutual assured destruction between the two nuclear superpowers, Russia and the United States.

ICBMs made their first appearance in Asia in the early 1960s, aboard US Polaris submarines and in the depths of Siberia. These were followed by China's deployment of the Dongfeng-5 land-based ICBMs in the early 1980s. In more recent years, Pakistan and India have both fielded ballistic missiles of sufficient range to strike each other's territory, while India's Agni V missile program will soon give it the ability to range all of China's population centres as well.

The most recent entrant to this nuclear long-range missile club is North Korea. Its seemingly successful test in July 2017 of an ICBM that could reach the US West Coast was just as important for its status as a nuclear power as its probable demonstration of thermonuclear warhead technology in the September 2017 nuclear test. Today, Asia is home to six nuclear powers – the US, Russia, China, India, Pakistan, and North Korea – which all have mastered at least the bare minimum of the missile technology required for their chosen deterrence postures. Even North Korea must now be credited with a limited, but nonetheless real, thermonuclear ICBM capability.

This is not to say that scope does not remain for significant technological improvement of many of these arsenals. All of Asia's nuclear powers are working on submarine-launched missiles, but technological difficulties and the need to make the submarines themselves survivable against an adversaries' anti-submarine forces, mean land-based capabilities will for many years remain the mainstay of their nuclear arsenals.

India's Agni V and North Korea's Hwasong-14 remain under active development and testing. The failure of North Korea's second test of the missile in late July 2017 was probably due to a more advanced re-entry vehicle design. India and China have joined Russia and the US in the ability to use solid-fuel engines for ICBMs, while Pakistan and Iran are working to transition their medium-range ballistic missile (MRBM) and intermediate-range ballistic missile (IRBM) programs away from liquid fuel.

North Korea's long-range missile programs however – perhaps due to their heavy reliance on creative re-use of Soviet technology – still heavily rely on liquid fuel engines. And the precision of modern US warheads, which has given all its ICBMs an even greater ability to destroy hardened point targets than they had during the Cold War, remains far greater than that achieved by any Asian nuclear power.

And yet, these differences today reflect strategic choices as much as basic technological ability. During the Cold War, Russia and the US used precise missiles with multiple independently

targetable re-entry vehicles (MIRVs) to improve their missile exchange ratios in a nuclear counterforce campaign. China has now also deployed MIRV-ed warheads on some of its missiles, while India and Pakistan continue to research this technology. However, their interest lies in increasing the lethality of their small arsenals in general, and of the fraction that might survive an adversary's counterforce strike and ballistic missile defence (BMD) system in particular.

The slow pace of China and India's long-range missile modernisations remains consistent with their underlying minimum deterrence postures, and indicative of the relatively low priority placed on the modernisation of their nuclear arsenals.

Access to technology has thus ceased to be the major constraint on the missile programs of the nuclear powers in Asia. This is a fundamental change from the situation during the Cold War and the 1990s when export controls in general, and the Missile Technology Control Regime (MTCR) in particular, were the main levers used by industrial nations to manage the threat of missile proliferation.

It is a development that was correctly forecast in the 1998 report of the independent Commission to Assess the Ballistic Missile Threat to the US (or 'Rumsfeld Commission' after its chairman, the previous and future Secretary of Defense Donald Rumsfeld). This report, in turn, was a major influence on the George W Bush Administration's decision in 2002 to withdraw from the 1971 Anti-Ballistic Missile (ABM) treaty, and proceed with a crash program to field a rudimentary ability to defend the US homeland against an ICBM attack.

In hindsight, the debates on the merits of missile defence in the US during the second Clinton and first George W Bush administrations were echoes of earlier Cold War debates, and not reflective of the new, multipolar nuclear world facing the US and its allies today.

The argument that a nuclear missile threat was best met by embracing the vulnerability of one's own population, and that it was 'destabilising' if not even morally wrong to seek to defend oneself against such a threat, did not survive long the reality of Iranian and North Korean missile and nuclear programs in the first decade of the 21st Century. The Australian Government's rejection of 'unilateral national missile defence systems' in its 2009 Defence White Paper (DWP) was thus less a return than an epitaph to the inter-allied BMD debates of the 1980s that had raged on the Reagan Administration's plans for a 'Strategic Defense Initiative'.

Today, the US and, in its geographic context, Israel, are most advanced in terms of the technology, breadth and number of their BMD systems. Most numerous and reliable are point-defence systems that grew out of general air defence missiles and that can intercept short-range missiles inside the atmosphere, such as Patriot or Standard Missile (SM)-2 block IV. Terminal High-Altitude Area Defense (THAAD) batteries suitable to defend larger areas against longer-range MRBM are now deployed on the US island of Guam and in South Korea.

However, the development of exo-atmospheric systems, which can intercept longer-range IRBM and ICBM warheads in space, has been less straightforward. The Ground-Based Interceptors (GBI) and ship-based SM-3 that were pressed into service in the mid-2000s were based on technology demonstrators, not regular development programs. By the end of 2017 there will be 44 GBI installed, mainly in silos in Alaska. They are the only systems able to defend the continental US from an ICBM attack, but the GBI production line has been shut down pending the successful test of a completely new kill vehicle that will address the shortcomings of existing designs.

Hence, North Korea's demonstration of its ICBM capability has even further increased public and policy focus on the SM-3 system. SM-3 had a relatively more successful test record, and greater visibility and political relevance for allies as it is forward deployed on US Navy Aegis ships, co-produced with Japan and in service with the Japanese Navy. However, the block II version with an

enlarged booster that makes full use of the space available in the Mk41 Vertical Launch System (VLS), is also yet to enter service. While this will provide both greater speed and increased range, and hence broaden the geometry of feasible intercept locations, the size limitations of naval launch systems will always make SM-3 more suitable for intercept of IRBM than of true ICBM, especially if these are launched from inland.

Despite the limitations of early interceptor designs, US and allied missile defence capabilities will thus continue to improve, not least because of improvements to battle management systems that link different sensors and enable more flexible employment of interceptors. Shore-based installation of SM-3, as existing in Romania, under construction in Poland and planned for Japan, will address some of the cost, capacity and availability issues that come with deployment on ships.

However, short of fundamental technological breakthroughs in direct energy, electromagnetic guns or space-based systems, the capacity of BMD systems will continue to lag by an order of magnitude the large conventional missile arsenals of Russia and China: US THAAD or SM-3 interceptor numbers measure in the low hundreds and are dispersed not just within Asia, but also in the Middle East and Europe. How much can missile defences thus really contribute to managing threats from missiles in Asia?

Intercepting adversary missiles is ultimately only a means to deny the adversary the strategic objectives they seek through missile use.

North Korea, as well as China in the 1995-96 Taiwan Straits Crisis, have sought to use missile 'tests' for political signalling and intimidation – to ultimately counterproductive effect. Today, the US and Japan have the technical ability to intercept North Korean missile tests. Incentives to do so will only increase if Pyongyang makes good on its threat to test a live nuclear missile in the Pacific.

In war, ballistic missiles have repeatedly been used in large numbers against civilian targets to impose generalised cost and hardship on the adversary, including by Germany in the Second World War, and by Iran and Iraq in the 1980s. This is the most challenging setting for missile defence systems from a cost-benefit calculation of individual intercepts, but also where missile defences have in recent years proved most effective in the defence of Israel against persistent attacks from the Gaza strip, and of Saudi Arabian cities against dozens of Scud and other missiles fired by from Yemen since 2016. In both conflicts, blunting the missile arsenals of Hamas and the Houthi rebels meant that Israel and Saudi Arabia were able to maintain control over the pace and intensity of these conflicts.

In Asia, however, China's conventional ballistic missiles directed against US, Taiwanese and Japanese forces and bases are far greater in number, as would be the cost of failing to intercept a single nuclear-tipped missile.

Even limited missile defence, as now exists at strategic bases in Japan, South Korea and Guam, and of centres of government in Taipei, Seoul and Tokyo, can help limit damage (for example, by allowing vulnerable large-bodied aircraft to depart before interceptors are exhausted), or make a decapitation strike far less likely to succeed. There is a good chance that even limited defences of the US continent would deny success to a North Korean ICBM attack, reduce the ability of China to improvise limited use of nuclear weapons in a conflict with the US, or blunt retaliation after a US counterforce campaign to destroy an adversary's nuclear arsenal.

In these scenarios, however, the value and role of missile defence capabilities only arise from their interaction with offensive forces. Controlling nuclear (and conventional) dangers from missiles in Asia must rest on nuclear deterrence, conventional counterforce capabilities and missile defence, and there are signs that the value of ballistic missiles for the US and its allies in this mix of forces is starting to be increasingly recognised once more.

This is most obvious in the case of South Korea, which in 2012 agreed with the US on a relaxation of earlier restrictions on its ballistic missile capabilities, and is now fielding ballistic missiles of 800-kilometre range that can target all of North Korea. More recently, US President Donald Trump also agreed that South Korea may field warheads above 500 kilograms, which will allow it to hold at risk a larger number of North Korean hardened bunkers. In wartime, South Korea's own missile capabilities will thus be a major factor blunting the missile threat from the North.

The ballistic missile capabilities of the US itself, however, remain limited by the 1987 Intermediate-Range Nuclear Forces (INF) treaty with Russia that bans it from operating or testing land-based cruise and ballistic missiles with a range of 500 to 5500 kilometres: exactly the type of arsenal that, in Chinese hands, is today a major threat to US military forces and installations in East Asia.

The US and German Pershing II missiles that were destroyed after 1987 were the first true precision-guided ballistic missiles. As long as the INF treaty remains in force, China can gain all the benefits of using conventional ballistic missiles – such as survivability, speed, throw-weight and ability to mass attack – against US and allied targets, while bearing none of the cost of having to cope with the same threat itself. And even in Europe, the North Atlantic Treaty Organization (NATO) has now lost its non-INF, nuclear systems of similar range (such as the F-111 bombers and French land-based missiles), while Russia continues to use Backfire bombers to intimidate NATO members and neutrals like Sweden, and has violated the treaty by testing a prohibited system from a land-based launcher.

The future of the INF treaty is thus not only a major question for international arms control and NATO-Russia relations, but also for the strategic balance in East Asia. Given the heavy reliance by Asian nuclear powers on ballistic missiles for their minimum deterrents, there are no incentives for them to disarm by joining the INF treaty.

Ultimately, however, the purpose of arms control is to help stabilise regional balances and reduce incentives for conflict. Today, China's ability to conduct a large-scale, conventional missile strike against the US and its allies carries the real risk that, to borrow a Cold War phrase, the Chinese People's Liberation Army (PLA) leadership might think it can brief the Politbureau of the Chinese Communist Party with a plausible theory of victory. To reduce the threat from missiles in Asia, the US and its allies may have to acquire more of their own.

https://www.policyforum.net/missiles-and-missile-defence-in-a-nuclear-asia/

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The Gulf Today (United Arab Emirates)

Kim Vows Victory against US

Author Not Attributed

December 14, 2017

SEOUL: North Korean leader Kim Jong-Un vowed to "win victory in the showdown" against the US with his rapidly advancing nuclear arsenal, state media said on Wednesday, after the country's latest missile test heightened global tensions.

The nuclear-armed North has rattled the international community with a flurry of nuclear blasts and missile launches, most recently on Nov.29 when it test-fired its longest-range intercontinental ballistic missile (ICBM), capable of reaching all major US cities.

Kim told workers behind the latest test that his country would "victoriously advance and leap as the strongest nuclear power and military power in the world" at a conference on Tuesday, according to state news agency KCNA.

"The... national defence industry will continue to develop and we will win victory in the showdown with the imperialists and the US," he was indirectly quoted as saying.

The country's nuclear force had been completed in a "death-defying struggle" and despite a high cost, he added.

Kim's comments come as global powers scramble for a response to the crisis, with the US backing stringent economic and diplomatic sanctions on Kim's regime to halt its nuclear drive.

But the North has continued to lob missiles, posing a major challenge to US President Donald Trump.

Fears of a catastrophic conflict with the nuclear-armed regime have spiked as the leaders have taunted each other, with Trump dubbing his rival "Little Rocket Man."

Tension flared anew in the flashpoint peninsula after the Nov.29 launch of the Hwasong-15 ICBM, which the North claimed could deliver a "super-large heavy warhead" anywhere on the US mainland.

Many analysts suggest that the rocket is capable of reaching the US mainland but voice scepticism that Pyongyang has mastered the advanced technology needed to allow the rocket to survive re-entry to the Earth's atmosphere.

Last month's launch was the first test of any kind since Sept.15, and quashed hopes that the North may have held back in order to open the door to a negotiated solution to the nuclear standoff.

But US Secretary of State Rex Tillerson said for the first time that Washington was willing to talk to Pyongyang "without preconditions."

The US has long insisted that the North should take concrete steps towards disarming before any negotiations, which should lead to complete, irreversible and verifiable denuclearisation.

"It's not realistic to say we're only going to talk if you come to the table ready to give up your programme," Tillerson told a meeting of the Atlantic Council policy forum.

"They have too much invested in it." But he also warned that the US military stands ready to act if necessary.

The latest military standoff prompted concerns of another full-scale conflict in the region after the 1950-53 Korean War that left much of the peninsula in ruins.

Even if a second war remained conventional, tens of thousands of South Koreans – as well as many of the 28,500 US troops stationed in the country – are expected to be killed just in the first days of fighting, analysts say.

In October, after Tillerson revealed he had open diplomatic channels to contact Pyongyang, Trump tweeted that his top diplomat was "wasting his time" trying to talk to Kim.

Further inflaming tensions, in the last week, the US and South Korea launched their biggest-ever joint air exercise, despite calls from China and Russia for a freeze in maneuvers.

http://gulftoday.ae/portal/ed8c1b39-7a88-4182-ad7b-cac34fb3c2dc.aspx

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EUROPE/RUSSIA

Tehran Times (Tehran, Iran)

EU's Mogherini: Preserving Nuclear Deal is 'an Absolute Must'

Author Not Attributed

December 13, 2017

European Union foreign policy chief Federica Mogherini said on Tuesday that preserving and implementing the 2015 nuclear deal with Iran is "an absolute must".

"We cannot afford to undermine the credibility of a multilateral agreement, endorsed by the UN Security Council Resolution, and we cannot afford to dismantle a deal that works and delivers on its promises," she said during her speech at the European Parliament plenary session.

Following is an excerpt of her speech published by the EU website:

It took us twelve years of extremely difficult negotiations, led by the European Union, to achieve these results. Renegotiating the deal or part of it is simply not an option – no one can possibly in good faith believe that this is a credible way to follow.

After President Trump's announcement on a new U.S. strategy towards Iran, we Europeans have made our position very clear. Preserving the deal is our shared security interest, and the best way for the United States to address their security concerns which are also ours, is in close cooperation with us, Europeans.

Dismantling a nuclear agreement that is working would not put us in a better position to discuss all the rest – the contrary would happen.

In fact, this is what we always do in our contacts with Iran. Discussing all the issues we have on the table, from cooperation to the difficult ones, including regional issues. On November 20th we held the latest EU-Iran High Level Dialogue, and as you know, I meet regularly with Foreign Minister [Mohammad Javad] Zarif. For more than two years now, we have built a very frank relationship with Iran: we are always open about our disagreements, and there are many, and we always try to find the best way to address them.

Since we reached the nuclear deal, our engagement with Iran has entered into a new phase.

Trade between Iran and Europe increased 94 percent in the first half of 2017, compared to the first half of 2016. Oil exports have reached pre-sanctions level, and billions of outstanding oil debts have been paid back. Foreign Direct Investment is increasing, and the Iranian government reported a growth of 55 percent compared to the previous year.

Progress in the financial and banking sector has been slower due to a number of factors. But important work is being carried out to improve the situation - also including on the Iranian side.

Civil nuclear cooperation is also integral part of the deal - and let me stress here, as the debate refers to the Iran nuclear deal, I am focusing here on the implementation of the deal and all the nuclear related parts of it.

http://www.tehrantimes.com/news/419292/EU-s-Mogherini-Preserving-nuclear-deal-is-an-absolute-must

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Mehr News Agency (Tehran, Iran)

Trump's JCPOA Policy Has No Basis for Implementation

Author Not Attributed

December 11, 2017

UK Foreign Secretary Boris Johnson reassured Iran's nuclear chief Salehi that Donald Trump's policies toward the nuclear deal have no basis for implementation.

The British Secretary of Foreign and Commonwealth Affairs Boris Johnson held a meeting with the head of Atomic Energy Organization of Iran (AEOI) Ali Akbar Salehi in Tehran on Sunday, during which the two sides discussed Iran nuclear deal (JCPOA), regional developments and bilateral relations.

Johnson voiced his country's full support for Iran nuclear deal, stressing his intention to urge Washington to remain committed to the agreement during his upcoming meeting with members of the US Congress.

"The prevalent atmosphere in the US continues to be in support of preserving the JCPOA," Johnson said. "The policies of the US president toward the agreement has not much basis for implementation."

The British diplomat further stressed his country's efforts for the gradual removal of obstacles to banking transactions between the two sides.

Salehi, for his part, underscored Iran's principled position on abiding with all its commitments, including those related to the nuclear deal, and called for removal of banking restrictions as a vital step toward preserving the JCPOA.

The two sides further exchanged views on the latest situation in Iraq, Syria, Yemen, as well as the current tension in Iran-Saudi Arabia relations.

The sides also voiced interest in expanding cooperation in the fields of applied science and nuclear medicine.

https://en.mehrnews.com/news/130136/Trump-s-JCPOA-policy-has-no-basis-for-implementation

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TASS (Moscow, Russia)

Strategic Submarines Borei to Enhance Russia's Nuclear Potential — Navy's Commander

Author Not Attributed

December 12, 2017

The potential of Russia's naval nuclear force will grow as more nuclear-powered Borei project submarines continue to be built, the Navy's commander-in-chief Admiral Vladimir Korolyov said on Tuesday.

"Maintaining the combat potential of the strategic naval force by commissioning Borei-A and Borei-B missile-carrying submarines at the proper level will be the main guideline for the fleet's development," Korolyov said at a joint meeting of the coordinating council of veterans' organizations and the Navy's command.

Korolyov briefed the Navy's veterans on the outlook for the development of the Russian Navy under the state program for armaments in 2018-2027. There are plans for building up the combat potential of the general purpose forces by creating ships for operations in the ocean, distant sea and littoral zones, upgrading vessels currently in service, providing advanced aircraft for Russia's Naval Aviation and coastal missile complexes for the on-shore naval units, and increasing the groups of ships carrying high accuracy weapons."

As the chief of Russia's General Staff General Valery Gerasimov said earlier, work is already in progress on creating strategic nuclear-powered Borei-B submarines.

Currently, the Russian Navy incorporates three strategic nuclear-powered Borei submarines (project 955) - The Yuri Dolgoruky, The Aleksandr Nevsky, and The Vladimir Monomakh. They are armed with solid propellant inter-continental ballistic missiles Bulava. Each submarine can carry up to sixteen such missiles. Another five Borei-A submarines are being built. The keel of the last submarine in the series, The Knyaz Pozharsky, was laid in December last year.

Earlier, the CEO of the Central Design Bureau Rubin, which developed Borei, Igor Vilnit, told TASS the project would be worked on further after the series of upgraded submarines Borei-A was delivered.

http://tass.com/defense/980533

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Reuters (New York, NY)

Russia Says It Is Fully Committed to Nuclear Missile Pact

Author Not Attributed

December 9, 2017

MOSCOW (Reuters) - Russia said on Saturday it was fully committed to a Cold War-era pact with the United States banning intermediate-range cruise missiles, a day after Washington accused Moscow of violating the treaty.

The U.S. State Department said on Friday Washington was reviewing military options, including new intermediate-range cruise missile systems, in response to what it said was Russia's ongoing violation of the 1987 Intermediate-Range Nuclear Forces Treaty.

The warning was the first response by President Donald Trump's administration to U.S. charges first leveled in 2014 that Russia had deployed a ground-launched cruise missile that breaches the pact's ban on testing and fielding missiles with ranges of 500-5,500 kms (310-3,417 miles).

Russian Deputy Foreign Minister Sergei Ryabkov said those allegations were "absolutely unfounded".

"They are not supported by the technical characteristics of the launch installation which allegedly does not comply with the treaty, or by flight telemetry data. Nothing. And it is understandable why - because it simply does not exist," he said in written comments published by the foreign ministry.

Echoing previous Russian statements, Ryabkov said Moscow was fully committed to the treaty, had always rigorously complied with it, and was prepared to continue doing so.

"However, if the other side stops following it, we will be forced, as President of the Russian Federation Vladimir Putin has already said, to respond in kind," he added.

The U.S. allegation has further strained relations between Moscow and Washington, and the State Department on Friday hinted at possible economic sanctions over the issue.

Washington has already sanctioned Russian entities and individuals, including people close to Putin, for Moscow's 2014 seizure of Crimea from Ukraine and its alleged interference in the 2016 U.S. presidential election. The Kremlin has repeatedly denied interfering in the election.

Ryabkov said the "attempts to frighten us with sanctions" were laughable.

"It's time for American politicians and diplomats to understand that economic and military pressure on Russia will not work," he said.

https://www.reuters.com/article/us-russia-usa-nuclear/russia-says-it-is-fully-committed-to-nuclear-missile-pact-idUSKBN1E30HZ

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MIDDLE EAST

Popular Mechanics (New York, NY)

U.S. Missile Defenses May Have Failed in Recent Mideast Attack

By Kyle Mizokami

December 4, 2017

A missile fired by Yemeni rebels might have gotten through Saudi Arabia's defense network.

A recent missile attack against the Saudi capital may not have been intercepted by American-made missiles after all.

New analysis of last month's attack on Riyadh's international airport shows that the warhead may have evaded missile defenses. The report highlights the complexity of missile defense—a crucial issue as one missile war is being fought in the Middle East and a second threatens in northern Asia.

Back in November, we covered a relatively underreported missile war between Iranian-backed Yemeni rebels and a coalition of Middle Eastern countries. Missile defense advocates say Saudi Arabia and the United Arab Emirates have shot down close to 150 missiles during this conflict, including one launched last month at Riyadh's King Khalid International Airport. The attack, and the launch of several Patriot missiles to shoot down the incoming missile, was captured on social media and shared widely. Here's video of the launch of Patriot missiles and the aftermath:

The missile is an Iranian-made Burqan-2. Houthi rebels launched it from Yemen at a distance of 610 miles. In response, Saudi air defense forces launched five Patriot PAC-3 missiles, a variant of the Patriot missile expressly designed to intercept incoming ballistic missiles. Wreckage of the Burqan-2 was found in downtown Riyadh, but the warhead traveled 12 miles more and exploded near the airport—about 1 kilometer (0.6 mi) from the domestic terminal. Here's a video of Burqan-2 missiles in Yemeni hands.

As outlined in Sunday's New York Times, the airport was indeed the target and the warhead came pretty darn close. Scuds aren't the most accurate missiles in the world, and a 3,000-foot miss is typical for Scuds. Homemade Iranian Scuds may be even less accurate. Regardless, it appears the warhead successfully separated from the missile. The discovery of the Burqan-2's engine and body in Riyadh seems to indicate it was a clean miss on the part of the Patriots.

What happened? There are all sorts of possibilities. One, the missile may have broken apart on reentry, after warhead separation. Falling debris might have confused the Patriots as to what the real target was, allowing the warhead to slip through. A similar situation occurred in 1991, when Iraq's Al-Hussein missiles broke apart moments before impact, creating a flying debris field that confused Patriot missiles and caused them to miss the warhead.

Another possibility is that the Saudis, caught off guard by the first-ever missile attack against their capital, simply responded too late. Perhaps the Saudis got a bad batch of missiles. Or perhaps the Patriot system just plain failed. The system is indeed responsible for many intercepts in the Mideast region since 2015, but some unknown variable in this intercept may have caused a failure. We may never know the exact cause, but the failure to intercept can't help but cause a little uncertainty just as Patriot PAC-3s protect American and Japanese soldiers and civilians from North Korean missiles.

http://www.popularmechanics.com/military/weapons/a14023053/us-missile-defenses-may-have-failed-in-recent-mideast-attack/

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The New York Times (New York, NY)

How ISIS Produced Its Cruel Arsenal on an Industrial Scale

By John Ismay, Thomas Gibbons-Neff and C. J. Chivers

December 10, 2017

WASHINGTON — Late this spring, Iraqi forces fighting the Islamic State in Mosul discovered three unfired rocket-propelled grenades with an unusual feature — a heavy liquid sloshing inside their warheads. Tests later found that the warheads contained a crude blister agent resembling sulfur mustard, a banned chemical weapon intended to burn a victim's skin and respiratory tract.

The improvised chemical rockets were the latest in a procession of weapons developed by the Islamic State during a jihadist arms-manufacturing spree without recent analogue.

Irregular fighting forces, with limited access to global arms markets, routinely manufacture their own weapons. But the Islamic State took the practice to new levels, with outputs "unlike anything we've ever seen" from a nonstate force, said Solomon H. Black, a State Department official who tracks and analyzes weapons.

Humanitarian de-miners, former military explosive ordnance disposal technicians and arms analysts working in areas captured from the Islamic State provided The New York Times with dozens of reports and scores of photographs and drawings detailing weapons that the militant organization has developed since 2014, when it established a self-declared caliphate in Syria and Iraq.

The records show the work of a jihadist hive mind — a system of armaments production that combined research and development, mass production and organized distribution to amplify the militant organization's endurance and power.

The resulting weapons, used against the Islamic State's armed foes on many fronts and against civilians who did not support its rule, were variously novel and familiar. At times they were exceptionally cruel.

One report noted that before being expelled from Ramadi, Islamic State fighters buried a massive explosive charge under a group of homes and wired it to the electrical system in one of the buildings.

The houses were thought to be safe. But when a family returned and connected a generator, their home was blown apart in an enormous blast, according to Snoor Tofiq, national operations manager for Norwegian People's Aid, which is clearing improvised weapons from areas that the Islamic State left. The entire family, he said, was killed.

Craig McInally, also an operations manager for the Norwegian demining organization, described indiscriminate inventions elsewhere — including four seemingly abandoned space heaters and a generator recovered near Mosul.

The heaters and generator, useful to displaced civilians and combatants alike, were packed with hidden explosives. The bombs had been configured, Mr. McInally said, so that if a person approached them or tried to move them, they would explode.

Taken together, the scope and scale of Islamic State production demonstrated the perils of a determined militant organization allowed to pursue its ambitions in a large, ungoverned space.

Some weapon components, for example, were essentially standardized, including locally manufactured injection-molded munition fuzes, shoulder-fired rockets, mortar ammunition, modular bomb parts and plastic-bodied land mines that underwent generations of upgrades. Many were produced in industrial quantities.

The findings also included apparent prototypes of weapons that either were not selected for mass production or were abandoned in development, including projectiles loaded with caustic soda and shoulder-fired rockets containing blister agent.

While the Islamic State has been routed from almost all its territory in Iraq and Syria, security officials say that its advances pose risks elsewhere, as its members move on to other countries, its foreign members return home and veterans of its arms-production network pool and share knowledge and techniques online.

"They're spreading this knowledge all over the world," said Ernest Barajas Jr., a former Marine explosive ordnance disposal technician who has worked with ordnance-clearing organizations in areas occupied by the Islamic State. "It's going to the Philippines, it's in Africa." He added, "This stuff's going to continue to grow."

Born of Insurgency

One reason for the Islamic State's level of sophistication was clear: Its armaments programs grew out of the insurgencies fighting the American occupation of Iraq from 2003 through 2011.

Sunni and Shiite militant groups became adept at making improvised bombs, both from conventional munitions abandoned in 2003 by Iraq's defeated military, and with ingredients that bomb-makers prepared themselves. American officials say certain Shiite groups received technical assistance and components from Iran.

Sunni bomb makers also fielded chemical weapons, sometimes by combining explosive devices with chlorine, a toxic substance with legal applications, and other times in bombs made from degraded chemical rockets or shells left from Iraq's defunct chemical warfare program.

The Islamic State, which evolved from Al Qaeda in Iraq, built upon its predecessors' lethal industry.

The group's larger success since also played a role. When the Islamic State seized swaths of territory and major cities in 2014, it took control of shops and factories with hydraulic presses, forges, computer-driven machine tools and plastic injection-molding machines. It also moved into at least one technical college and university lab. This infrastructure positioned the Islamic State for an arms-production breakout.

Behind the capacity was an armaments bureaucracy that supervised product development and manufacture, said Damien Spleeters, head of operations in Iraq and Syria for Conflict Armament Research, a private arms-monitoring and investigative firm that has done field work in both countries during the war.

The system was resilient, Mr. Spleeters said. One of the Islamic State's projects, a series of recoilless launchers that gained prominence late in the battle for Mosul, in northern Iraq, was built from the ground up even while militants were pressured in combat from multiple foes on multiple fronts.

"It just kept going," Mr. Spleeters said of the technical advancements. "They could develop stuff even as they lost territories."

The Islamic State's arms bureaucracy was also disciplined. Detonating cord used in improvised explosive devices was measured and allotted down to the centimeter, Mr. Spleeters said. When a stock ran out, management would fill out a request form for more. The material would be resupplied.

Mr. McInally said the group's armament production appeared centralized and carefully considered.

As de-miners have found weapons, he said, they have routinely encountered improvised devices with a modular design that allowed for the Islamic State's fighters to choose from uniform parts and assemble devices quickly. The separate parts were issued distinctly, to be combined before use.

"It's a collection of pressure plates, a collection of charges, a collection of switches," Mr. McInally said. "Components that can be connected as necessary. It's clever. It's impressive."

The New York Times is withholding technical details of weapons and explosive mixtures described in this article to prevent the spread of information useful to copycats.

Mr. Barajas said the explosive charges themselves were further standardized — via a so-called homemade explosive with a recipe the group tweaked and produced at an industrial scale.

The mixture, he said, is a widely known combination of ammonium nitrate fertilizer and aluminum with a long history of use in many conflicts, including in Iraq. But the Islamic State improved the explosive with the addition of another material that makes it easier to detonate. The Times previously documented the Islamic State's importation of large amounts of ammonium nitrate from Turkey, along with sections of heavy pipe.

Mr. McInally said the group also standardized other items: supplemental charges for mortar rounds to extend their range; a common fuze with a spring-loaded striker assembly machined from an over-the-counter bolt; and an improvised bomb — he said de-miners refer to it as a land mine — that was fielded in a standard-sized plastic tub.

The mines resemble an Italian-made antipersonnel mine called the VS-50, though the Islamic State's version is much larger, prompting de-miners to dryly refer to it as the "VS-500."

As time passed, newly produced VS-500 mines became increasingly water-resistant, extending their life in the ground. Similarly, the striker fuzes that the Islamic State has fielded show signs of being made resistant to moisture and rust.

The first-generation land mines, Mr. McInally said, were not well made. "They didn't weather well," he said. But by the time the Islamic State was defeated in Mosul, he said, it had improved the design and salted the battlefield and villages with weapons "that last a long, long time."

The Islamic State has also engaged in organized scavenging, including collecting dud American-made bombs dropped by coalition warplanes and repurposing their explosive power. One set of

photos provided by a de-miner show how the group set up an open-air chop shop to cut open unexploded American aircraft bombs and remove the explosive inside.

These explosives tend to be more powerful and more reliable than homemade explosives. Mr. Barajas said the Islamic State put what it had scavenged to priority use — in suicide attacks.

"Every time I'd run an explosive test on the ordnance buried in the ground, if I found it connected to the pressure switches, it would come back as 'homemade explosives,'" he said. But the explosives in suicide vests and belts, he added, were compounds, including RDX and TNT, extracted from conventional ordnance.

Not all of the Islamic State's developments have been effective. When experimental designs failed, Islamic State engineers made changes or moved on.

According to an American government official who examined an analysis of the rocket-propelled grenade filled with blister agent, the weapons would probably not fly a predictable and accurate path. X-rays, he said, showed that they had been only partly filled, and were unbalanced.

Similarly, the Islamic State seemed to struggle with a series of mortars filled with caustic soda, or lye, a strongly alkaline compound that is sold in a heavy flake form and sometimes used as a drain cleaner.

Dozens of locally produced mortar projectiles filled with caustic soda were found by de-miners in Manbij, Syria, in late 2016. Mr. Barajas analyzed the discovery.

"Caustic soda is extremely hazardous. It'll burn your skin," he said. "If you inhale it, it'll cause death." But the material is also corrosive, so much so that it damaged the interior of the shells the Islamic State had used to hold it.

He said that the Islamic State tried loading 120-millimeter mortar rounds with caustic soda, but that the munitions rusted to the point of exuding salts. They could not be safely fired. "I think once they got this bad reaction, they moved away from this," Mr. Barajas said.

Put to Brutal Use

Many of the Islamic State's bombs have been used against the military and police forces fighting it. Aso Mohammed, a Kurdish de-miner with the Swiss Foundation for Mine Action, said that by his estimates, improvised explosive devices have been responsible for 60 percent of casualties of Kurdish pesh merga soldiers in Iraq's north.

But other uses were consistent with the Islamic State's well-documented disregard for international law and humanitarian concerns evident in their abductions, public executions, production of snuff films and bombings of public spaces.

In a prepared statement, the American military in Baghdad noted that coalition forces have recovered and destroyed booby-trapped teddy bears. De-miners and their supervisors in Iraq frequently trade reports and details of other Islamic State-made booby traps, among them dolls, stuffed animals and plastic trucks, as well as teapots, fire extinguishers, flashlights and copies of the Quran.

Two de-miners, Steve Kosier and Mr. Mohammed, of the Swiss demining organization, said that the Islamic State's locally made weapons had evolved in a predictably sinister fashion. Improvised devices that once were connected to a single plate that would cause the bomb to explode were later in the campaign connected to several plates — an adaptation intended to slow de-miners as they cleared buildings, roads and terrain.

Mr. Kosier said he had disabled one makeshift bomb that "had four pressure plates surrounding the container with a 9-volt battery for each plate." Each plate was connected by a separate electrical circuit to a container of homemade high explosives, which in turn had an "anti-lift device" beneath it — essentially a booby trap added to an already complex booby trap.

The ambition behind such a trap, de-miners said, is to kill people trying to make the Islamic State's former turf safe.

https://www.nytimes.com/2017/12/10/world/middleeast/isis-bombs.html

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The Jerusalem Post (Jerusalem, Israel)

Iran Nuclear Deal Remains in Play as Trump's Deadline for Sanctions Passes

By Yonah Jeremy Bob

December 12, 2017

Top US officials have expressed an interest in keeping the deal in place, and have told Trump that Iran is complying with it.

On Tuesday, the 60-day deadline US President Donald Trump gave the US Congress to fix or scrap the Iran nuclear deal will pass – with no serious, formal action.

Does this mean that his decertification move failed, that he will scrap the deal on his own or that a new kind of dynamic has started regarding the Iran deal, which is still playing out? First, let's explain Congress's lack of action to date.

It was not for lack of a will to act – US Senator Bob Corker and some other partners had a bill ready to go to fix the deal.

Although Trump did not want to be bound by having to reapprove the nuclear deal every three months, his threat that, absent Congressional action, he might completely scrap the deal on his own was not to sell Congress.

The deal was already unpopular in Congress two-and-a-half years ago; now Congress has been working to reduce Iran's capacity as a nuclear threat, at least in the short-term.

No Democrats want to scrap the deal – and about a dozen Republican senators don't want to scrap it either.

Former CIA Director Michael Hayden, who opposed the deal, has told The Jerusalem Post that for now it should be kept, with an eye to individually address its shortcomings. Former IDF military-intelligence chief Amos Yadlin wrote similarly in a Post op-ed last month.

Even current CIA Director Mike Pompeo – possibly Trump's closest adviser – admitted two weeks ago that he told Trump that Iran is in short-term compliance with the deal.

Just as important – and related to Congressional non-action – Europe was unmoved, at least in the short-term, by Trump's threat to scrap the deal.

If Europe is not on-board with re-sanctioning and re-negotiating the deal with Iran, most observers view any unilateral action by the US as having a limited impact.

There is essentially no real level of trade between the US and Iran to sanction away. And if the US tries to penalize its European partners for trading with Iran, they have threatened lawsuits in

international courts – which they might very well win, since virtually no one says that Iran has formally broken the deal.

But there is another track.

The Post reported last month on a position paper by former defense minister Moshe Yaalon recommending that Trump formally leave the deal as is, but work with European allies to pressure Iran regarding issues not directly related to the deal, such as limiting its ballistic-missile testing and sponsorship of regional terror, and accepting an eventual extension of the deal's nuclear restrictions.

Similarly, Former CIA Director Hayden told the Post in October that if Trump was not so stuck on the "nuclear now," then "maybe Europe might be more serious about nuclear tomorrow." Then the West could avoid "freeing up Iran about everything else" – its terror across the Middle East.

Again, like Yaalon and Yadlin, Hayden was suggesting negotiating with the Europeans and the UN to pressure and potentially sanction Iran for behaviors outside of the deal, most notably ballistic missile testing and regional terror, which bother everyone.

While Europe would oppose directly adding these elements into the deal, there have been signs that both France and England are upset by Iran's missile testing and regional terror and might very well support pressure on Iran if it is viewed as separate from the deal.

This brings us back to the deadline. It is an artificial one.

So is another deadline in mid-January set by the State Department.

Many experts say that the key is not to pressure Iran by tomorrow or by next month, but rather to reunite the West and eventually the UN against Iran ballistic-missile testing and regional terror.

There are different opinions about when Iran could or should be pressured to extend the deal's nuclear restrictions, but many feel this will be more possible once momentum is started on the other critical issues.

The strategy would have to be less direct – and it is unclear how such a strategy would allow enhancing International Atomic Energy Agency inspections of Iran's military sites, which have been largely off-limits. It is also the kind of slow, painstaking diplomacy that Trump seems to loath.

But he may choose to go for it, pocketing his October-speech moment as freeing him from being perceived as approving the deal, and listening to the unified position of his advisers who oppose scrapping it entirely.

Justice Minister Ayelet Shaked told the Post last month that she was willing to give Trump and the US more time on the issue. And Ambassador to the US Ron Dermer, considered to be close to Prime Minister Benjamin Netanyahu and to Jared Kushner, last week mentioned six to nine months as a fair period in which to expect progress.

This would allow Trump to leave his loaded gun on the table – the threat to scrap the deal on his own – while giving diplomacy with US allies a longer chance to bear fruit.

http://www.jpost.com/American-Politics/Iran-nuclear-deal-remains-in-place-as-Trumps-deadline-for-sanctions-passes-517794

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Politico (Washington, DC)

Iran's Foreign Minister Warns Europe Away from 'Unreliability' of the U.S.

By Louis Nelson

December 11, 2017

Iran's foreign minister blamed the Trump administration in an op-ed published Sunday for "tantrums" on issues related to foreign policy, calling on European nations not to follow the lead of the U.S. when it comes to relations with the Islamic Republic.

"Unfortunately, for the past 11 months, the response to Iran's good faith has been tantrums from the Trump administration. But the unreliability of the United States — from climate change to Palestine— has become predictable," Mohammad Javad Zarif wrote in The New York Times.

"Our main concern now is cautioning European countries against wavering on issues beyond the scope of the nuclear agreement and following in lock step behind the White House," he continued. "As the nuclear deal and the Middle East enter uncharted and potentially combustible territory, it is imperative that Europe helps ensure that we don't soon find ourselves repeating history."

Earlier this fall, President Donald Trump announced that he would decertify Iran's compliance with the Joint Comprehensive Plan of Action, the landmark nuclear deal struck during the Obama administration by Iran and the five permanent members of the United Nations Security Council, plus Germany. Trump stopped short of asking Congress to reimpose nuclear-related sanctions on Iran, instead urging new legislation that would trigger fresh penalties down the line.

The nuclear deal had been a regular target of Trump's during last year's presidential campaign, with the president pledging on the stump that he would pull the U.S. out of the deal entirely. And while he has yet to fully make good on that promise, Trump has thrust doubt onto the deal that his predecessor championed as a foreign policy triumph that would keep Iran from obtaining a nuclear weapon.

Iran remains listed by the U.S. State Department as a state sponsor of terrorism, one of just four nations to be given such a designation. Its officials have often called for the destruction of Israel.

Zarif, in his op-ed, claimed U.S. stubbornness during the administration of former President George W. Bush cost the international community a chance at a nuclear deal. The agreement struck in 2015, he said, "is a rare triumph of diplomacy over confrontation. Undermining that would be a mistake."

He also defended his nation's missile program as defensive and its progress predicated on past battles, including the Iran-Iraq war. He claimed the missile program's advancement has been geared towards accuracy, a capability not required for a nuclear missile.

"Europe should not pander to Washington's determination to shift focus to yet another unnecessary crisis — whether it be Iran's defensive missile program or our influence in the Middle East," he said. "This would repeat the very dynamics that preceded the nuclear deal."

https://www.politico.com/story/2017/12/11/iran-foreign-minister-mohammad-javad-zarif-nytimes-288867

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INDIA/PAKISTAN

India Today (Noida, India)

A Peek into India's Top Secret and Costliest Defence Project, Nuclear Submarines

By Sandeep Unnithan

December 7, 2017

India's indigenous nuclear submarine project hums in top gear with the launch of its second ballistic missile submarine. But other projects face huge technical challenges.

India's top secret nuclear submarine project reached another decadal milestone last month with the launch of a second ballistic missile submarine, the Arighat. On November 19, Union defence minister Nirmala Sitharaman cracked the auspicious coconut on the fin of the submarine in the drydock of the Ship Building Centre (SBC) in Visakhapatnam in a low-key ceremony. Following this, the SBC's drydock was flooded and the submarine quietly floated out. It will be at least another three years before the navy commissions the Arighat.

The event skipped the high-profile public ceremony of the Arihant's launch in 2009 even as the four-decade Advanced Technology Vessel (ATV) project to field a series of ballistic missile firing nuclear submarines is now moving at a furious assembly-line pace.

Two new units, the S4 and S4 'star', displacing over 1,000 tonnes more than the Arihant class will move into the SBC drydock vacated by the two Arihant class submarines. These submarines, fitted with eight ballistic missiles or twice the Arihant's missile load, will be launched by 2020 and 2022. An official says the Arighat launch has more to do with creating more work space within the cramped SBC for assembling the S4 and S4*. The ATV project is India's costliest defence project. The programme to build four SSBNs (hull classification symbol for a nuclear-powered, ballistic missile-carrying submarine) is India's largest defence programme, estimated at Rs 90,000 crore. Each of these nuclear-powered sharks costs upwards of Rs 4,000 crore, not counting the infrastructure created by the Bhabha Atomic Research Centre (BARC) to build their nuclear powered reactors and the Defence Research and Development Organisation's (DRDO) submarine launched ballistic missiles (SLBMs).

The project's pan-India spread-headquartered in New Delhi, hull fabrication facility in Gujarat, missile development in Hyderabad, nuclear reactor in Tamil Nadu and final assembly in Visakhapatnam-is the biggest Make in India industrial ecosystem-nearly 60 per cent of the submarine's components are indigenous. It is also the cornerstone of Indo-Russian strategic cooperation; top officials admit the project would not have been possible without extensive Russian design and technical assistance. Ahead of the submarine arm's golden jubilee on December 8, the ATV programme has nearly doubled in size with a Rs 60,000 crore project to build six indigenous nuclear-powered attack submarines (SSNs).

"It has kicked off," navy chief Admiral Sunil Lanba told the media about the SSN project on December 1. "It is a classified project? the process has started." Design work for the indigenous SSNs displacing around 6,000 tonnes is under way at a newly constructed submarine design centre in Gurgaon. SSNs are armed with conventional cruise missiles and torpedoes but powered by nuclear reactors which give it excellent underwater speed and endurance.

The navy has opened up talks for the lease of another Akula-class submarine from Russia for over $2 billion, to replace the existing INS Chakra when it is returned in 2022 after the end of its lease. (The Chakra is currently non-operational after an incident last August). Meanwhile, final design work is under way on a new series of 13,500-tonne ballistic missile submarines. Called the 'S-5', it

will be twice the weight of the Arihant class SSBNs and armed with 12 nuclear-tipped missiles. Earlier this year, the DRDO flagged off its K-6 SLBM project, a missile with an ICBM-like range of 6,000 km. The first phase of Project Varsha, a nuclear submarine base, will be completed by 2022. The base will house India's SSBN fleet in concrete pens blasted out of the hills at Rambilli 50 km south of Visakhapatnam, reportedly at a cost of Rs 30,000 .

THE THIRD LEG OF THE TRIAD

A nuclear engine allows a submarine to travel almost indefinitely underwater. They don't have to surface to recharge their batteries like conventional diesel-electric submarines (SSKs) and they move faster underwater because they avoid surface wave resistance.

The Arighat, like the Arihant, is a ballistic missile submarine or a boomer because it carries nuclear-tipped missiles and forms the third leg of a triad of air, land and sea-based nuclear weapon carrying platforms, enunciated in India's draft nuclear doctrine after the May 1998 Pokharan-2 nuclear tests. When India observes the 20th anniversary of the tests five months from now, it will have a modest sea-based deterrent with one SSBN in service and a second soon to join it.

"The triad becomes effective when you have a submarine operational at all times. In our case, a triad is operational only part of the time-when the Arihant sails out to sea," says strategic analyst Bharat Karnad. When an Indian SSBN sails out of Visakhapatnam and into the Bay of Bengal, it can virtually disappear for months, remaining underwater, its endurance limited only by the endurance of its crew, communicating only through extremely low frequency (ELF) antennae which it trails in the water. While bombers, mobile missile launchers, missile trains and ground-based launchers can be tracked, nuclear submarines are virtually undetectable. This is what makes them the most precious asset of the nuclear triad.

Submarines thus become an important component of India's 'no first use' policy for nuclear weapons because they act as guarantors of 'assured retaliation' or a second-strike, preventing any surprise first-strike by a nuclear-armed adversary. They are vital at a time when China's PLA Rocket Forces can target any point on the Indian mainland with nuclear tipped missiles and India has fewer retaliatory options.

The Arihant has so far been equipped with 12 B-05 SLBMs which have a range of 750 km-which means a distant transit to an adversary's shores. A 3,500-km range missile, the 'K-4' is still in trials-the DRDO is to conduct a fourth test of the missile sometime in December, from a specially designed submersible pontoon launcher in the Bay of Bengal. Final tests of the K-4 from the Arihant are due in the Bay of Bengal in the near future. These are to be followed by tests of a K-5 missile, a 5,000-km SLBM, a project started in 2015. The 'K series' missiles are all named after former president A.P.J. Abdul Kalam. The K-4 and K-5, each of which can carry a two-tonne warhead will give the triad a longer, more robust leg.

Information about the ATV project is meagre. It operates directly under the supervision of national security advisor Ajit Doval and is now wrapped in deep levels of secrecy. A navy proposal for a high-profile launch of the Arighat where the PM and cabinet ministers would be present was overruled by the PMO. Security around the project is the heaviest for any publicly known military facility (the navy recently cited security concerns to acquire a public road passing near the SBC in Visakhapatnam).

Naval top brass are chary of even discussing the project either in public or in private. "That (the ATV) is a classified project... I'm not going to take any questions on that," navy chief Admiral Sunil Lanba told the media a press conference on December 1, a marked departure from a predecessor who claimed, rather disingenously in 2010, of the INS Arihant undertaking 'a deterrent patrol by 2012'. The Arihant was inducted into service in August last year after weapon trials but continues

to undertake extensive trials but without a prolonged sea deployment. An actual deterrent patrol-where a nuclear-missile armed submarine goes into its operational area armed with nuclear warheads-is thought to be further away.

The launch of the Arighat comes amidst fast-changing geopolitical developments. The Chinese navy has deployed and initiated the fastest submarine expansion of any navy since the end of the Cold War with an operational undersea force of 63 vessels-5 SSNs, 4 SSBNs and 54 SSKs.

It recently sold a class of eight conventionally powered diesel-electric submarines to Pakistan, at least some of which are likely to be fitted with nuclear-tipped missiles.

"Sea-based deterrents are going to become more important as time passes, especially for a country with a no-first use policy," says strategic analyst Rear Admiral Raja Menon (retired). "The location of your nuclear weapons becomes known and even a half per cent knowledge of your existing weapon sites each year could add up to something substantial over the years, thus degrading your deterrent."

THE HUNTER-KILLERS

A solitary two-month patrol by a Chinese submarine in late 2013 came as a rude wake-up call for India's security establishment. Chinas most advanced SSN, a Shang class, sailed out from its bastion in Hainan island on December 13, 2013 and returned after a two-month 'anti-piracy' patrol in the Indian Ocean, on February 12, 2014. R&AW assessments termed the deployment 'seriously aggravated India's security concerns'. The ATV headquarters soon dusted out plans for building a series of six indigenous SSNs, shelved by the government over a decade ago due to budgetary constraints. Plans called for a series of submarines capable of speeds of over 25 knots and diving to 500 metres.

SSNs are like multi-role fighter jets, ferocious underwater predators. The navy's INS Chakra, for instance, can run underwater at speeds of close to 30 knots, more than twice the speed of conventional diesel-electric submarines, stalk and hunt warships and attack shore targets.

But like fighter jets, their performance lies in their propulsion plant, in this case a high output nuclear reactor which can cope with the tremendous bursts of sustained speed without degrading reactor output. And this is where the Indian Navy and BARC are said to be staring at a technological abyss. An 83 MW SSBN reactor like that of the Arihant, is essentially meant for slow, steady operation, using it onboard an SSN would call for more frequent refuelling cycles.

One solution believed to be under contemplation is for BARC to design a twin-reactor configuration for the SSN to meet its increased power demands. Another solution currently being explored would be to get foreign design assistance and leapfrog from India's second generation reactor technology to fourth gen.

DREAMS OF A BEHEMOTH

The ATV headquarters building in New Delhi's cantonment area has a rather unusual name: 'Akanksha' or desire. Since its start in the 1970s, the nuclear submarine project has been a dream-never constrained by finance, only by technology.

BARC's prototype 83 MW light water reactor at Kalpakkam, the S-1, used to train nuclear submariners.

There's a reason for the modest size of the Arihant class submarines and why they are called 'baby boomers'. When the Pokharan-2 nuclear tests announced India's entry as a nuclear weapons power, the Arihant class were meant to be SSNs. Post the tests, they were converted into SSBNs-DRDO inserted a plug with four short-ranged ballistic missiles. The design got another tweak a decade ago

after an intervention from then finance minister P. Chidambaram who was on the political committee which monitors the classified programme. The minister questioned the billions being spent on a boat launching just four nuclear tipped missiles. The ATV project team came back with an 'Arihant-stretch'-an additional 10-metre-long plug for four K-4 SLBMs to be integrated into the S-4, then on the design board. The plug would increase the weight of the submarine by nearly 1,000 tonnes without significantly altering its performance. An additional unit, the S-4* was sanctioned in 2012 when it became clear that the S-5 would take a longer development cycle and would result in the ATV line being idle.

Plans for building a new series of strategic nuclear submarines had begun over a decade ago when the missile payload and reactor capacity constraints of the Arihant class submarines became evident.

In 2006, a high-level committee under Dr R. Chidambaram, principal scientific advisor to the government of India, assessed India's ability to design and construct a class of three new SSBNs the 'S5', to be fielded beginning in 2021. It budgeted Rs 10,000 crore, to be divided among BARC, DRDO and the ATV project headquarters, to begin the project by 2015. The project continued in the development stage and an indication of a possible long lead construction time began when the government sanctioned a fourth unit around five years ago (squeezed between the two projects as the 4*) to keep the nuclear submarine line employed. (S-1 being the shore-based pressurised water reactor at the DAE facility in Kalpakkam, iterations of which are on the Arihant class.)

The S-5 is the true-blue SSBN on par with those fielded by the five permanent members of the UN Security Council.

Plans drawn up over a decade ago called for an SSBN of 13,500 tonnes, a behemoth displacing nearly the weight of India's first aircraft carrier the INS Vikrant and armed with 12 SLBMs with ranges of 6,000 km and with multiple independently targetable re-entry vehicle (MIRV) capability.

In February this year, the DRDO's Hyderabad-based Advanced Naval Systems began a fourth separate SLBM project-the K-6 missile. This three-stage solid-fuel missile with a 6,000 km range is said to be completely different from the K-4 and K-5. It will carry MIRVs and will be ready for induction in less than a decade. These new missiles, over 12 metres tall and over 2 metres in diameter, will carry a three-tonne warhead. The K-6 will ensure that the future Indian SSBN's bastion area will be within the Bay of Bengal, from where it can target all its potential adversaries. A former head of India's Strategic Forces Command hinted at this in a 2014 think tank event in Washington when he said that India's sea-based deterrent would eventually "be secured in havens, waters we are pretty sure of, by virtue of the range of the missiles. We will be operating in a pool in our own maritime backyard." From the safety of its depths, Indian SSBNs would be able to target all its potential adversaries with its 6,000-km range ballistic missiles (SLBMs).

The SSBN fleet is based on the east coast for reasons of geography-the Indian continental shelf dips sharply into the abyssal Bengal fan. A submarine can dive and be concealed just 2 nautical miles from harbor (a submarine on the west coast can dive only after sailing out for 80 nautical miles).

The S-5 is on the drawing board but the project team has already started ordering its ancillary equipment. A new dockyard is being created at the SBC and sources say the project will have an indigenous component of over 80 per cent when they are built a decade from now.

Yet, as is the case with the indigenous SSN, the main challenge in building the S-5 lies in its propulsion plant-a 190-MW nuclear plant- says an official familiar with the project. Development work has started on this new plant will have thrice the output of the Arihant's 83 MW reactor which uses Highly Enriched Uranium (HEU). A former BARC official and part of the Reactor Projects Division which built the Arihant's reactor is confident the 83 MW can be scaled up. "One of the

biggest challenges in a naval reactor is compacting it to fit a confined space. Since the new platform (S-5) will have a bigger volume and displacement, upscaling the present reactor should be no problem."- Without a breakthrough in propulsion technology, India's sea-based deterrent will continue to be a modest one.

http://indiatoday.intoday.in/story/india-ballistic-missile-submarine-k-6-submarine-launched-drdo/1/1104982.html

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COMMENTARY

Real Clear Defense (Chicago, IL)

Nuclear Deterrence in a New Age

By Keith Payne

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Introduction: On Deterrence

Carl von Clausewitz writes that the nature of war has enduring continuities, but its characteristics change with different circumstances. Similarly, the fundamental nature of deterrence has endured for millennia: a threatened response to an adversary's prospective provocation causes that adversary to decide against the provocation i.e., the adversary is deterred from attack because it decides that the prospective costs outweigh the gains. The character of deterrence, however, must adapt to different circumstances. In one case, the necessary deterrent threat may be to punish the adversary; in another, to deny the adversary its objectives; in yet another, a combination of punishment and denial threats may be necessary to deter. Such specific characteristics of deterrence—its goals, means and application—change, but the fundamental threat-based mechanism of deterrence endures.

The introduction of nuclear weapons in 1945 dramatically expanded both potential threats and the corresponding means of deterrence, as was recognized almost immediately by some at the time. The contemporary emergence of new types of threats, such as cyber and modern biological weapons, will again affect the character of deterrence. But its nature endures, and the fundamental questions about deterrence remain as elaborated by Raymond Aron and Herman Kahn during the Cold War: who deters whom, from what action, by threatening what response, in what circumstances, in the face of what counterthreats?

Despite the continuity in the basic nature of deterrence, significant geopolitical, doctrinal and technological developments now demand that we again adapt our deterrence goals, means and applications to a new strategic landscape. During the Cold War, U.S. nuclear deterrence strategies had to adapt to the relatively slow changes and enduring continuities of a bipolar strategic environment, and thereafter to the dramatic systemic transformation brought on by the collapse of the Soviet Union and Warsaw Pact. A basic task now is to understand how a third and dramatically different new strategic environment must again reshape the character of our deterrence strategy—its necessary means and application, particularly including the role of nuclear weapons.

Effective deterrence and extended deterrence for U.S. allies requires that U.S. deterrence capabilities be sufficiently credible, as perceived by diverse adversaries, to cause them to decide against the provocations we have identified as unacceptable, now and in the future. Doing so now demands that we be capable of adapting our deterrence strategies and capabilities to shifting

circumstances, including future adversaries and contexts that are not now obvious. This is a task of uncertain dimensions and unpredictable demands.

The rapid pace of technological innovation and proliferation has magnified the scope of change and uncertainty in the emerging threat environment. Adversaries and potential adversaries are improving familiar capabilities and acquiring new and unprecedented instruments of coercion and warfare. Some appear willing to employ or abide by the employment of weapons that have, until recently, been deemed outside supposedly global norms, such as chemical weapons. Improvements in ballistic and cruise missiles, missile defenses, anti-access and area denial measures, hypersonic, cyber and space weapons have or will open new domains for threat and warfare, and, correspondingly, pose new challenges for U.S. deterrence strategies.

This new strategic environment is very different from that of the Cold War or the immediate post-Cold War period. As we consider how to adapt deterrence to the realities of this period we first need to understand the necessary deterrence roles for our nuclear weapons given the emerging spectrum of adversaries and potential adversaries who are pursuing external goals that threaten us, our allies and the existing post-Cold War order in general. Effective nuclear deterrence is increasingly important in this new strategic environment characterized by severe, coercive nuclear threats against us and our allies, and the increasing prospect for adversary employment of nuclear weapons, and possibly other WMD.

Deterring Adversaries and Potential Adversaries in the New Post-Cold War Era

During the Cold War, our deterrence focus was primarily on the Soviet Union, and to a lesser extent on the People's Republic of China. With the end of the Cold War and the collapse of the Soviet Union, there was a striking reduction in the generally perceived level of nuclear threat from Russia and China, and a corresponding reduction in the generally perceived value of U.S. nuclear weapons and nuclear deterrence. Following 9/11, the United States moved further away from interest in nuclear weapons, focusing heavily on defeating terrorism for almost two decades. Washington paid limited attention to nuclear weapons, save for consideration of how to reduce their salience and pursue their numeric reduction; the Obama administration in particular highlighted nonproliferation and the elimination of nuclear weapons as the priority goals of U.S. nuclear policy.

Yet, over the past decade, U.S. adversaries and potential adversaries have moved in a wholly different direction, emphasizing the roles of nuclear weapons and expanding their arsenals. For example, Moscow clearly feels that it must correct an unacceptable loss of position supposedly imposed on it by the West following the collapse of the Soviet Union. Unsurprisingly, Moscow is pursuing Great Power competition aggressively, with a revanchist agenda backed by coercive nuclear threats. Its explicit nuclear threats to the West surpass even those of the Soviet Union during the Cold War, and its nuclear programs, according to Gen. Valery Gerasimov, the chief of the Russian General Staff, already have resulted in the modernization of three-fourths of Russia's "ground, air and sea strategic nuclear forces."

In addition, during the Cold War and the decades immediately thereafter, the United States devoted immense time and treasure into the negotiation of, and compliance with arms control treaties and agreements. Now, however, Russia engages in continuing, willful noncompliance with many, perhaps most of its arms control commitments, most notably the 1987 Intermediate-Range Nuclear Forces Treaty (INF), and China avoids transparency and arms control in favor of strategic ambiguity.

Chinese leaders feel that they must overturn a "century of humiliation," and, in doing so are provoking U.S. allies severely as Beijing seeks to overturn the existing order in Asia. Its illegal

expansionism and rapidly growing military capabilities, nuclear and non-nuclear, pose a direct threat to U.S. allies and interests.

These Russian and Chinese goals and worldviews are important to U.S. considerations of deterrence strategies because cognitive studies that were not available in the 1960s or 1970s indicate that decision makers typically are willing to accept greater risks to recover that which they perceive to be rightfully theirs, but are denied. Western deterrence goals to preserve an international order which these Great Powers now seek to overturn will be particularly challenging as they seek to recover what they believe to be rightfully theirs, but now is denied them by Western opposition. Russia's illegitimate occupation of Crimea and China's illegal expansion into the East and South China Seas certainly appear to reflect this dynamic.

North Korea's extreme nuclear threats and long-range means of delivery now pose a clear and present danger to the United States and allies. At this point, North Korea may be merely months away from the capability to launch nuclear armed missiles at U.S. cities. It is imperative that the United States effectively deter this eccentric rogue power.

Iran seeks hegemony in the Middle East and threatens U.S. allies and friends in the process. Iranian leaders correspondingly express extreme hostility toward us and our allies—most recently labeling the United States Iran's "number one" enemy. Despite the Joint Comprehensive Plan of Action (JCPOA), apparently, Iran could acquire nuclear capabilities quickly if it decides to do so, and it continues to pursue robust missile programs, including the development of long-range missiles. Protecting U.S. allies and interests in the region may become an increasingly challenging goal given Iran's goals and potential capabilities.

While terrorist organizations continue to threaten us and our allies, we must now recognize the reality of both Great Power and Rogue aggressive nuclear threats and possible employment. This reality is a far cry from the hope and even expectation of the past two decades that such concerns belonged to the past, never to return. Over the past two decades, this belief—that with the passing of the Cold War, interstate nuclear threats were largely gone and U.S. nuclear requirements greatly eased—has been at the heart of virtually every argument against U.S. efforts to modernize aging, "legacy" U.S. nuclear forces and the aged U.S. nuclear scientific and industrial infrastructure. To realists, this belief was an obvious illusion. But it was peddled by a professional anti-nuclear lobby and embraced by those captured by the hubris and feel-good emotion of it all.

Despite the now manifest fact that significant interstate nuclear threats are again a prominent characteristic of the international environment, the claim continues to be repeated that because the Cold War is over, U.S. nuclear deterrence requirements are minimal. For example:

Thankfully those days are over. The Soviet Union disappeared 25 years ago. Current Russian belligerence, although worrisome, does not constitute a renewed Cold War…Our submarines alone give us an assured deterrence…The United States does not need to arm its bombers with a new generation of nuclear-armed cruise missiles…Similarly, the United States should cancel plans to replace its ground-launched ICBMs….

The 20th Century Cold War is over; that is self-evident. But the claim that U.S. nuclear requirements thus are minimal, and correspondingly that, "our submarines alone give us an assured deterrence," is a highly-speculative non sequitur presented as if a known, self-evident fact. It is, instead, an outdated, imprudent basis for U.S. nuclear policy—a subject area that demands the greatest prudence.

Indeed, the contemporary nuclear threat environment poses more diverse and severe challenge to U.S. deterrence strategy than were operative during the Cold War, with greater uncertainties about the future. No one, regardless of their position or experience, can claim with any credibility to

know that some relatively modest set of U.S. nuclear capabilities provides "an assured deterrence" vis-à-vis a broad spectrum of known and now-unknown opponents and contingencies, particularly for the many future decades in which U.S. nuclear deterrence capabilities are expected to function.

The number and character of states and terrorist organizations that may join the array of adversaries and potential adversaries is uncertain. But new adversaries and nuclear threats undoubtedly will emerge over the multi-decade lifetimes of the fledgling U.S. nuclear programs initiated by the Obama Administration to replace the aging U.S. nuclear triad of strategic bombers, sea-based and land-based missiles. Deterring a diverse array of recognized adversaries and potential adversaries is complicated by their widely divergent worldviews, values, goals, priorities, risk tolerances, determination, and perceptions of U.S. credibility. Deterring future adversaries not yet recognized is, by definition, a challenge for which we must prepare without knowing the precise dimensions of the threats they will pose or the requirements for deterrence.

During the Cold War, the number of deterrence variables was much more limited, and during the immediate post-Cold War era the need for nuclear deterrence supposedly was coming to an end. Now, however, the spectrum of potential opponents and conflict scenarios ranges from the relatively familiar to the largely unfamiliar; the stakes at risk now differ widely; our ability to communicate credible deterrence threats now is less certain; and, our ability to predict when and how deterrence will function increasingly is stretched.

These realities drive the U.S. need to be able to tailor deterrence strategies across an expanding spectrum of opponents and threat contexts, nuclear and non-nuclear. Russia, for example, now emphasizes the role of nuclear coercion and the value of limited nuclear first-use as a tool of statecraft, and to backstop its non-nuclear military expansion. Its notions of "escalate-to-de-escalate" essentially envision nuclear weapons as instruments of coercion to defeat the West's will and capability to respond in strength to Russian expansionism. Moscow appears to expect that its nuclear threats, or limited first-use if necessary, will compel Western capitulation in crises or conflict. Effective deterrence now requires that the West dispel such destabilizing Russian expectations.

In addition, with the ultimate goal of unifying the Korean Peninsula under its rule, North Korea is expanding its nuclear capabilities and often issues coercive nuclear threats. From the 1990s to the mid-2000s, North Korea used its nuclear program to extort diplomatic concessions, economic assistance, and food aid from us and our allies. Secretary of Defense James Mattis has stated that North Korea now has the capability to strike, "everywhere in the world, basically." With an emerging capability to threaten the United States with nuclear-armed intercontinental ballistic missiles (ICBMs), the prospect is for even greater demands and coercive nuclear threats by the "shakedown state."

Effective deterrence now demands much greater attention to the deterrence requirements posed by diverse adversaries and contexts, and the force flexibility needed to adapt our deterrence strategies and capabilities accordingly. In particular, we must understand how to deter Great Powers and nuclear-armed Rogues from exploiting limited nuclear threats and/or escalation for coercive purposes in support of their respective goals to change established orders and boarders in Europe, Asia, and prospectively the Middle East. To do so, we must first understand and address the reasons why some now perceive the freedom to engage in repeated nuclear threats against us, our allies and friends.

Why, for example, might Moscow perceive potential success in a nuclear strategy that includes its escalation to limited nuclear first use. What "gaps" does Moscow perceive in Western deterrence strategies, and how can those perceptions be corrected? The same questions must be answered for all adversaries that follow a similar script, now and in the future.

In this new environment, the range of possibilities and uncertainties has expanded regarding plausible answers to the enduring deterrence questions posed by Aaron and Kahn: whom must we deter, from what action, by threatening what response, in what circumstances, in the face of what counterthreats?

Implications for U.S. Deterrence Strategies and Capabilities

The basic nature of deterrence endures. We do not require a new theory of deterrence, but rather we must pursue the hard work of understanding how to apply deterrence effectively in dramatically new and different circumstances. To wit, we must understand how to deter a more diverse set of adversaries and potential adversaries, from a wider array of specific actions, in a similarly wider array of plausible circumstances, while also hedging against the unknown and unexpected.

Several points may be made now in this regard. First, the set of adversaries and potential adversaries, their goals and capabilities, are far from fixed or familiar, and they will shift over time. So too, the range of U.S. deterrence goals and the nuclear requirements needed to support those goals, now and into the future, can never be considered fixed. Instead, we can be certain our deterrence goals and requirements too will shift over time with the changing threat environment.

Consequently, the existing U.S. policy of "no new" nuclear capabilities, which might have been compatible with an era in which nuclear deterrence requirements were expected to continue fading, is ill-suited to contemporary realities. The United States must be able to adapt its nuclear deterrence strategies and related capabilities to shifting threats; "new" nuclear capabilities may very well be needed and the United States must be able to field those capabilities as necessary to deter.

Second, Clausewitz' emphasis on the extreme value of "prudence" in defensive war applies equally to deterrence in this new strategic environment. It simply is prudent to recognize the need for the U.S. capacity to adapt and tailor U.S. deterrence strategies and capabilities as rapidly as possible across a wide spectrum of plausible threat and conflict conditions—some that are now recognized, others that are not now apparent, but surely will emerge. Prudence calls for highly-flexible and resilient U.S. deterrence strategies and capabilities, nuclear and non-nuclear, to deter the much broader spectrum of known and plausible threats and contingencies of this new post-Cold War era. The resilience and flexibility of our deterrence strategies and forces, including nuclear, is essential to our capacity to tailor U.S. deterrence strategies and capabilities to diverse and shifting adversaries, threats, and contexts.

To be sure, since the early years of the Cold War, successive presidents have demanded more flexible deterrence strategies and nuclear forces. The sense behind that demand is ever more apparent with the need for deterrence strategies and forces that must be tailored to an expanding number of potential adversaries and threat scenarios—and prospectively to threats now unknown.

Third, the great value of the U.S. nuclear triad is the resilience and flexibility inherent in the diversity of the triad's platforms and weapons. That value is not fading, as was claimed often during the immediate post-Cold War years. It is increasing, as has the urgency of the fledgling programs underway to replace all three legs of the U.S. triad reaching the ends of their already-extended service lives. The nuclear infrastructure enabling U.S. nuclear capabilities has suffered decades of very limited investment, and its recapitalization now demands comparable urgency.

Fourth, effective U.S. deterrence now requires that the United States work to deny Moscow's apparent confidence that it can defeat U.S. and NATO deterrence strategy via threats of nuclear escalation, or actual nuclear first-use in crisis or conflict.

To address the "gap" in the U.S. deterrence strategy as perceived by Moscow presupposes that we can identify the reasons why Moscow believes it has the freedom to threaten nuclear escalation or actually engage in limited nuclear escalation. This is a difficult intelligence challenge because it requires getting inside the minds of senior Russian civilian and military leaders to understand what they think and why, not simply their forces and operations. Nevertheless, on the basis of open Russian writings, it is reasonable to suggest that the reasons underlying Russia's perceptions of nuclear license include Moscow's perceptions of advantages in both will and theater nuclear force numbers and options.

Consequently, NATO must work to close Moscow's disdain for NATO's will and cohesion. Efforts to do so may be seen in the recent public statement by NATO General Secretary, Jens Stoltenberg: "We are sending a very clear message: NATO is here, NATO is strong and NATO is united." NATO activities that reinforce that message by demonstrating alliance cohesion and military capability are likely to be critical.

If the "gap" includes Moscow's perception of advantage stemming from Russia's much greater theater nuclear capabilities and options, then the United States must determine the most efficient way to close that perceived "gap." The easy response that undoubtedly will be preferred by many in Washington is to assert condescendingly that Moscow simply should not be so primitive in its thinking as to believe that greater theater nuclear numbers and options bestow an exploitable advantage. That easy, scolding response, however, may well not convince Moscow leaders of the error in their thinking.

Closing that possible gap almost certainly will not necessitate mimicking the extraordinary Russian theater nuclear arsenal, but it will likely demand an expansion of Western nuclear options with a focus on their credibility in Russian perception. Getting this right will be one of the most important deterrence challenges of the coming decade for the United States and NATO. Parallel efforts in Asia in support of Asian allies also will likely be critical.

Fifth, for decades the U.S. has been devoted to the process of nuclear arms control. Most discussions of deterrence and nuclear forces must pay homage to the goal of negotiated nuclear reductions lest they seem unsophisticated. Unsurprisingly, there are calls now for further arms control efforts to solve the deterrence challenges that have been created intentionally, indeed eagerly, by foes, including the mounting North Korean nuclear threat and the great theater nuclear force asymmetry in Russia's favor.

Arms control can, in principle, contribute to U.S. security by establishing mutual restraints on forces and threatening behavior. However, to be helpful, arms control agreements must be prudent, implemented mutually, and enforced if there is non-compliance. Agreements with negotiating partners who are very likely to violate those agreements, such as Russia and North Korea, carry the serious potential to harm U.S. and allied security rather then help. Unenforced, even well-negotiated agreements are likely to offer only a feel-good illusion of security.

In short, expecting arms control with foes and potential foes to solve the U.S. security problems they have purposefully created is naïve in the absence of: 1) serious U.S. enforcement efforts and mechanisms; and, 2) the types of incentive that make agreements and compliance the opponent's preferred choice, i.e., to gain relief from feared U.S. capabilities. We learned this lesson with the INF Treaty. As then-Secretary of State George Schultz has stated: "If the West did not deploy Pershing II and cruise missiles, there would be no incentive for the Soviets to negotiate seriously for nuclear reductions," and, "strength was recognized as crucial to diplomacy."

For over a decade now, however, the United States has often expected nuclear arms control returns without the necessary investment to warrant Russian interest. The reality that "strength" is

necessary for diplomacy was replaced by the idealistic expectation that U.S. restraint would be mimicked by others because that is what others should do. The result of this U.S. lapse into idealism is contemporary Russian disdain for U.S. arms control enthusiasm, as reflected in the statement by then-Russian Presidential Chief of Staff, Sergei Ivanov: "When I hear our American partners say: 'Let's reduce something else,' I would like to say to them: 'Excuse me, but what we have is relatively new.' They [the U.S.] have not conducted any upgrades for a long time. They still use Trident [missiles.]" The lessons of the past should once again inform U.S. arms control expectations and actions in this new era of intense Great Power competition.

Finally, the roles for U.S. ballistic missile defense (BMD) will take on considerably greater importance in this new era. Given the proliferation of nuclear weapons and means of long-range delivery to countries such as North Korea and potentially Iran, the value of U.S. defensive forces capable of defeating the missile attacks of rogue states, now and in the future, is of paramount importance. U.S. defenses may also be extremely valuable to protect against any accidental or unauthorized missile launches. This is a capability that is growing in importance as missile proliferation continues and if, as has been reported, some established nuclear powers consider a policy of launching their nuclear forces "immediately upon detecting an incoming attack." U.S. defensive capabilities may also be valuable to promote deterrence stability by degrading the confidence any potential adversary might have in the coercive or strategic value of limited nuclear first use.

Conclusion

The international threat environment is in the midst of a significant transition from the immediate post-Cold War period to an era that is much more challenging. During the initial decades following the Cold War, many Western leaders anticipated a "new world order" in which nuclear weapons would play an ever-declining role because nuclear threats had, supposedly, become a thing of the past. With the collapse of the Soviet Union, the U.S. security focus was on regional conflicts and countering terrorism, missions for which nuclear weapons seemed to have little or no role. Correspondingly, the question of nuclear deterrence and the U.S. forces and infrastructure required for nuclear deterrence was not a high priority; indeed, to the extent that U.S. policy focused nuclear weapons, it was largely on reducing their salience and numbers as milestones toward their elimination.

However, the expected "new world order" never arrived, and potential foes never embraced the U.S. goal of reducing the salience and number of nuclear weapons as milestones toward nuclear disarmament. Indeed, over the past decade and more, they have instead moved in wholly contrary directions in support of their efforts to change established orders in Europe, Asia, and prospectively the Middle East. Consequently, the new security environment of the 21st Century is characterized by: intensified Great Power competition; the renewed prominence of nuclear threats against the West by Great Powers and rogues; and, profound uncertainties about the future. There is little or no apparent evidence of movement in fundamentally more benign directions.

Given these harsh realities, the basic nature of deterrence endures, but the character of U.S. deterrence strategies must adapt to a new era. This demands a departure from many of the nuclear policy directions that emerged, on a bipartisan basis, over the past two decades in the expectation of an increasingly benign future. In short, despite serious efforts to leave nuclear deterrence, forces and thinking in the dustbin of history, the United States must once again confront the world as it is and invest in the thinking, nuclear capabilities and infrastructure critical to the deterrence or defeat of strategic attacks, nuclear and non-nuclear.

https://www.realcleardefense.com/articles/2017/12/14/nuclear_deterrence_in_a_new_age_112781.html

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Defense News (Vienna, Va)

Regional Defense Is US National Defense

By Cdr. Kirk Lippold (ret.)

December 12, 2017

Recognizing the seriousness of the growing threat to the Asia-Pacific region and the United States, it was a welcome sign that President Donald Trump recently reclassified North Korea as a state sponsor of terrorism. This designation puts North Korea under increasingly harsher sanctions to reinforce the nonnegotiable denuclearization of the Korean Peninsula.

Upping the ante, China and some of its banking and industrial institutions are finally being precisely targeted in an effort to apply much-needed diplomatic and economic pressure to the one country responsible for allowing North Korea to grow into this threat. The region is on edge and is looking to the United States to take a leadership role to help build up their defenses, especially with ballistic missile technology and systems.

The previous administration's phased, adaptive approach to regional ballistic missile defense was designed to phase in additional capability as it became available and adapt to changes in the threat. This effort on land and at sea in Europe, the Middle East and the Asia-Pacific region includes a focus on getting allies and partners to deploy their own missile defense capabilities and working to integrate them with U.S. systems to improve regional protection. Although President Trump stated that "[North Korea] must end its unlawful nuclear and ballistic missile development," this approach must also be met with even further credible and capable actions that serve to bolster the regional defenses of our allies.

The current Ballistic Missile Defense Review, being conducted by the Department of Defense, will examine the administration's policies for protecting U.S.-deployed forces, allies and partners around the globe. Key steps in this effort include the expansion of the missile defense toolkit available to combatant commanders and national-level decision-makers, to include cyber, drones and directed energy. Even with these rapidly improving programs, it is critical that we continue to apply pressure quietly but directly on China while simultaneously investing in proven missile defenses that exist today.

North Korea continues to improve the success rate of its ballistic missile programs, along with maintaining an active nuclear weapons program. Coupled with this development, Russia, China and Iran have large stockpiles of both ballistic and cruise missiles, and they are increasing their arsenals with a proven propensity to proliferate these weapons. Of particular concern is Russia, which has demonstrated a willingness to develop a cruise missile with a range that violates the Intermediate-Range Nuclear Forces Treaty, intimidate and threaten Europe, and gain valuable operational experience in the deployment and operational use of cruise missiles in Syria. The conflux of these threats drives the need for a credible response.

First, the U.S. Navy should increase the number of destroyers that are equipped with missile defense capability. Currently, there are 33 ships capable of performing the missile defense mission, but providing this capability for all 62 currently operating Aegis destroyers should be a top priority. As with any program of this magnitude and scope, Congress must adapt to the evolving order of the threat to our nation and adopt a multiyear procurement system for the purchase of SM-3 and SM-6 interceptors to strengthen missile defense at the lowest cost to taxpayers.

Second, the administration should deploy additional land-based anti-ballistic missile systems for the protection of deployed forces and allies, while reducing the burden on the naval fleet. The full range of land-based missile defense interceptors — Terminal High Altitude Area Defense, Patriot and Aegis Ashore — remain high-demand, low-density assets. With only six operational THAAD batteries, this is an unacceptably low number that constrains combatant commanders because they are not available in sufficient numbers to counter emerging worldwide threats.

Third, the president should direct the modernization and integration of all regional sensors and weapons systems — to include those allied systems that are compatible with U.S. capabilities — to ensure a broader and more effective missile shield. A cornerstone of this enhanced capability is a cost-effective architecture that will provide the clearest picture of the ballistic missile battlefield and increase the chances of a successful intercept.

In short, the sum is greater than the parts.

The U.S. must continue to exercise every instrument of national power to deter further development of North Korean nuclear weapons and ballistic missiles. China knows it is key to this process. The continued deployment of ballistic missile capabilities coupled with regional weapons-system integration will make China realize the futility of supporting a government and regime that has no future as either an economic partner or buffer state. The threat can and must be addressed head-on and ultimately result in a nuclear-free Korean Peninsula.

https://www.defensenews.com/opinion/commentary/2017/12/12/regional-defense-is-us-national-defense-commentary/

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War on the Rocks (Washington, DC)

Deterrence in Retreat: How the Cold War's Core Principle Fell Out of Fashion

By T. Negeen Pegahi

December 7, 2017

National security specialists talk about deterrence a lot. Like, a lot. Analysts are churning out a steady stream of articles debating how best to deter a variety of actors from taking a variety of unwanted actions in a variety of domains and/or using a variety of weapons. As the author of one such piece put it, "The deterrence message is broadcasting on all channels."

What gets lost, however, in all these separate debates over distinct foreign-policy issues is how much of a role deterrence actually plays in U.S. national security strategy writ large, how that role is changing over time, and what factors are driving that shift. A popular contemporary conception views strategy as the identification and balancing of ends, ways, and means. Deterrence, defined as "discouraging an action or event through instilling doubt or fear of the consequences," is a key way actors may try to achieve their ends. But despite its continued prominence in national security discussions, the actual role of deterrence in U.S. policy has declined in recent decades, due to expanding U.S. objectives – along with the strategic problems this expansion has ushered in – and increasing U.S. capabilities. This longer-term shift has only been exacerbated and made more obvious by the current administration.

One Option Among a Menu of "Ways"

The shortcomings of deterrence as a "way" are well-known. Most immediately, deterrence can work only against rational actors who make cost-risk-benefit calculations. Many believe, however, that

non-state actors, and possibly some states, are driven by religious or ideological imperatives instead of the kinds of strategic calculations deterrent efforts can hope to influence. And deterrence can fail even against actors who do make those sorts of calculations. Factors such as strategic culture, degree of shared understanding, internal political dynamics, and biases and risk orientations can all systematically skew others' decision making in ways U.S. planners may not understand. Each of these limitations will reduce the role deterrence plays in any nation's strategy.

More relevant than deterrence's strengths and weaknesses in a vacuum, however, is the extent to which deterrence is actually a relevant way of attaining U.S. goals. Actors have a broad menu of ways from which to choose to try and achieve their objectives. These can be divided into what Thomas Schelling called "brute force" vs. "coercion" (or what Lawrence Freedman calls "controlling" vs. "coercive" strategies). Brute force is all about capabilities: trying to build up one's own and/or degrade those of others in order to make others less able to harm U.S. interests. Imposing economic sanctions on Iran, for instance, could be part of a brute-force effort if the point was to reduce Tehran's ability to take some unwanted action, such as developing nuclear weapons – e.g., by limiting the Iranians' access to key materials. Common concepts such as "offense," "defense," "damage limitation," "preemption," "prevention," "rollback," and "resiliency" all fall under this umbrella.

Coercion, on the other hand, is all about choices: trying to influence others' decision making in order to make them less likely to try to harm U.S. interests in the first place. There are two variants of coercion: Deterrence seeks to convince others to maintain their current choices or behaviors, while compellence – a word coined by Schelling that never quite caught on – seeks to convince others to change their choices or behaviors. Sanctions against Iran could be part of a coercive effort if U.S. policymakers believed the threat or actual imposition of sanctions would shape Tehran's cost-benefit calculations in such a way as to convince Iranian leaders to do what Washington wanted. Understanding deterrence and its place in the broader menu of strategic "ways" helps us see how the relative importance of each way has changed over time.

The Declining Role of Deterrence

During the Cold War, deterrence took pride of place in U.S. national security strategy, and for good reason. While some U.S. policymakers and analysts never gave up on the dream of circumventing "mutually assured destruction," most understood that brute force was not an option when it came to the primary threats facing the country – thermonuclear war with a Soviet Union whose arsenal had reached rough parity with that of the United States and large-scale conventional war with a Warsaw Pact that overmatched NATO. This left coercion as the only broad option. Within the types of coercive strategies, compelling the Soviet Union to voluntarily make concessions was a non-starter, largely for the same reasons. The best the United States could hope to achieve was to deter Soviet attempts at further gains. Americans may never have embraced deterrence but most accepted that there simply weren't any other real options.

However, since the Cold War, three changes have considerably reduced the role deterrence plays in U.S. strategy. First, the United States in many important respects no longer seeks to maintain the status quo, which means that even 100 percent successful deterrent efforts cannot achieve U.S. objectives. The collapse of the Soviet Union meant a loosening of constraints on the exercise of U.S. power, and U.S. goals have expanded accordingly. In each portion of the "four-plus-one" threat framework that the Department of Defense currently uses to guide planning and prioritization, the goal is to revise the relevant circumstances in America's favor, not to maintain them. Specifically, U.S. leaders seek to slow, halt, or, ideally, roll back Chinese efforts in the South and East China Seas, Russian subversion of U.S. allies and partners in its perceived "near abroad," Iranian pursuit of increased power and prestige in the Persian Gulf, North Korean progress on its nuclear weapons

and related delivery vehicle programs, and violent extremist organizations' increasing entrenchment across large swaths of the globe. Given these objectives, if the United States attempts to engage in coercive approaches, they are likely to involve compellence, or attempts to change the status quo, not deterrence.

Second, this expanded security framework geared towards changing the status quo means that in a number of circumstances, coercive strategies broadly – whether deterrent or compellent – may simply not be viable. Adversaries might perceive the benefits of defying U.S. wishes to be so high that there is no cost the United States can threaten that would convince them to cooperate. Efforts to acquire, maintain, and expand nuclear arsenals might fall into this category. For instance, North Korean leader Kim Jong Un likely views his country's nuclear weapons and delivery systems as the only means of guaranteeing his hold on power. It is hard to imagine what the United States could threaten that could outweigh this perceived benefit of remaining a nuclear-armed state and thereby convince him to scale back, much less give up, his nuclear arsenal.

Adversaries might also perceive the costs of defying U.S. wishes to be so low that there is no reason not to try, even if they think success is unlikely. As Washington pays greater attention to newer domains, others' efforts to harass the United States, its interests, and allies in or through cyberspace might fall into this category. Cyber espionage efforts in particular are intensifying and spreading around the globe, in part because of how inexpensive they are for states to conduct. (And of course, low perceived retaliatory costs also undermine U.S. efforts to convince others, such as China, to change their behavior.)

Regardless of what they expect the consequences of defiance to be, adversaries might also perceive the benefits of complying with U.S. demands to be of such doubtful reliability that there is no reason to do so. For coercion to work, a state or group needs to believe not only that the United States has the capability and will to carry out any threatened action should that actor defy U.S. wishes, but also that the United States will refrain from carrying out the threat should the actor in fact comply. Since the Cold War, U.S. leaders have repeatedly shown that it will carry out threats even if the adversary complies with American aims. Supporters of George W. Bush's decision to attack Iraq didn't withdraw their backing when the initial justification for the war collapsed; Barack Obama pursued regime change in Libya despite the fact that Moammar Qaddafi had given up his nuclear program; and Donald Trump decertified the Iran nuclear deal even though Tehran is complying with its terms. This bipartisan track record signals that Washington can't be trusted to uphold its end of a bargain, which will likely make it harder for the United States to convince others to act in accordance with its wishes in the future.

Third, advances in intelligence and technology may have made brute force a more viable option for some security concerns. Policymakers certainly seem to think this is the case. At the high end of the conflict spectrum, analysts argue that the United States is better able to locate and destroy concealed and hardened nuclear weapons delivery systems, their command-and-control sites, and the secure means of transmitting their launch orders. As a result, preventive or preemptive strikes might be able to meaningfully limit the damage the United States or its forces or friends would suffer in any retaliatory strike. National Security Advisor H.R. McMaster and other administration officials seem to believe this can be done with respect to North Korea. Even some critics of such an attack believe the United States nonetheless has the capability to remove the threat posed by Pyongyang "in one swift blow." And Trump himself has expressed great confidence, however ill-founded, that U.S. missile defense systems could handle North Korean intercontinental ballistic missiles. Believing that U.S. forces, allies, and even cities can be defended against retaliatory strikes makes a U.S. first strike – a classic example of brute force – appear viable.

At the low end of the spectrum, the intelligence-operations fusion allowed by the find, fix, finish, exploit, analyze, and disseminate (F3EAD) targeting methodology has exponentially increased the number of suspected insurgents taken off the battlefield. F3EAD was first developed by U.S. special operations forces in Iraq and subsequently extended to general-purpose forces and around the globe. U.S. commanders seem to genuinely believe these tactical and operational achievements have produced strategic effects by breaking insurgent networks. While Trump has been less clear as to how such efforts would achieve U.S. objectives, he has been adamant that the United States stop nation-building and focus instead on "killing terrorists." Across a range of contingencies, then, brute force appears to have gained ground.

In sum, deterrence no longer supports many U.S. objectives, there are a number of circumstances in which coercion in general is less likely to work, and there are many others in which brute force might work – and in which U.S. leaders clearly think it will or already does.

So What?

These shifts in the relative importance of various "ways" are likely to hamstring U.S. national security strategy in the coming years. Brute force is unlikely to be useful in dealing with the wide range of challenges posed by Russia and China. This leaves coercion as an obvious approach. But successfully influencing others has gotten increasingly difficult for Washington since the Cold War, given the expansion of U.S. objectives on the one hand and adversaries' resultant concern about regime survival, the decreasing costs of challenging U.S. interests, and the declining credibility of U.S. assurances on the other. The current administration's sidelining of the intelligence community and gutting of the State Department has only further thinned America's strategic toolkit, reducing Washington's ability to acquire the type of information that could help policymakers design and implement coercive efforts with a better chance of success. And finally, in a shift from a grudging acceptance of the status quo during the Cold War, U.S. policymakers now seek to revise it in a number of important areas, leaving even less room for deterrence in U.S. strategy.

National security specialists will no doubt continue to talk about deterrence. But its role in U.S. strategy has declined considerably. Diagnosing how and why that has happened is an important addition to the conversation – particularly for those who hope to one day bring deterrence back in from the cold.

https://warontherocks.com/2017/12/deterrence-retreat-cold-wars-core-principle-fell-fashion/

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The Hill (Washington, DC)

It's Time for a Military Solution to North Korea

By Peter Pry

December 11, 2017

Thae Yong Ho, high-ranking North Korean diplomat and defector, told the foreign policy establishment exactly what they wanted to hear in his Nov. 1 testimony before the House Foreign Affairs Committee.

"We should continue the current momentum of sanctions and campaign of diplomatic isolation. I think it is the only way to force North Korea to give up its nuclear ambition," Thae said.

One of North Korea's aristocracy, defecting as deputy ambassador to the United Kingdom in 2016, Thae Yong Ho's testimony is highly valuable — less for his recommendations, and more for his revelations about the thinking of North Korean elites.

Thae, intelligent and sincerely seeking peaceful solutions, has absorbed the values and flaws of western diplomacy, including boundless faith in negotiation. He has "gone native" — which is why he defected.

Thae speaks hopefully about how "soft power" liberated Eastern Europe from Soviet domination, led to the disintegration of the USSR, and won the Cold War.

The Cold War with the USSR lasted 45 years. Do we have time to wage a new Cold War with North Korea?

There are many compelling reasons — including the mindset of North Korean elites described by Thae Yong Ho — to act militarily now. Risky as even surgical conventional strikes against North Korea may be, the dangers of continuing patient diplomacy are far riskier:

1) Buying time for sanctions and diplomacy to peacefully disarm nuclear North Korea means entrusting our lives to a mutual assured destruction (MAD) relationship with the psychopath in Pyongyang.

North Korea can already make an electromagnetic pulse (EMP) attack that would blackout the North American grid and threaten the very existence of the United States. Will Kim Jong Un passively endure economic sanctions threatening regime survival — and not revenge himself on the U.S. with EMP attack?

U.S. economic sanctions moved Imperial Japan to attack Pearl Harbor in 1941. Yet Japanese Emperor Hirohito was a paragon of humanity and non-aggression compared to Kim.

2) Thae testifies North Korea will sell nuclear weapons to Iran and anyone: "Absolutely, because North Korea is a country who wants to sell anything for the hard currency."

This alone — the risk of an A-Bomb or H-Bomb transferring to Iran or terrorists — is reason enough to destroy North Korea's nuclear weapons program now.

3) Despite Thae's endorsement of patient diplomacy to disarm nuclear North Korea, his description of the paranoia and deep mistrust of the U.S. by North Korean elites would seem to make a diplomatic solution impossible.

Thae testifies the example of Libya looms large in the minds of North Korean elites. Libyan dictator Muammar Gaddafi gave up his nuclear weapons program, in exchange for promises of normalized relations with the West, only to be attacked by NATO and executed.

Thae acknowledges this history makes the U.S. untrustworthy to Pyongyang.

4) Thae implied nuclear command and control arrangements may be on a hair-trigger, with low-level commands pre-authorized to launch nuclear missiles if North Korea is attacked. According to Thae, Pyongyang's thousands of artillery and missiles in range of Seoul — armed with conventional, chemical and biological warheads — are pre-authorized to destroy South Korea's capitol immediately.

The same logic applied to ICBMs would virtually guarantee nuclear missile strikes on the U.S. by accident or miscalculation — another reason to destroy at least North Korea's ICBMs immediately.

5) Thae implied the only reason Kim has not yet attacked the United States may be because of his confidence in nuclear blackmail: "He would continue to blackmail America with a possible nuclear war against America and … to pull American forces from South Korea."

According to Thae, Kim sees "the existence of a prosperous and democratic South Korea … by itself a major threat toward his dynasty … he also believes it necessary to drive American forces out of the peninsula. And this can be done, he believes, by being able to credibly threaten the United States with nuclear weapons."

According to Thae, North Korean elites see in the Vietnam War good reason to think they can win a new Korean War. Vietnam proves American political will can be broken. When the U.S. withdrew from Vietnam, South Vietnam quickly weakened, enabling easy conquest.

Thus, North Korean nuclear weapons are not just for deterrence, but to launch a war of aggression.

6) North Korean elites are hyper-aggressive. They see U.S. fear of nuclear weapons and susceptibility to nuclear blackmail dating back to January 12, 1950, when Secretary of State Dean Acheson excluded South Korea from the U.S. Pacific "defense perimeter" in a speech to the Washington Press Club. Thae testified North Korean elites believe the Soviet A-bomb tested in 1949, U.S. fear of nuclear war, moved Acheson to exclude South Korea from the "defense perimeter."

So Kim Il Sung, Kim Jong Un's grandfather, launched the Korean War.

North Korean elites learned exactly the wrong lessons from the Korean and Vietnam wars, seeing in both evidence of U.S. weakness.

Mutually assured destruction is likely to become exactly that against North Korean elites enamored of nuclear blackmail, and ready to go to war over a mistake originally made in an old speech at the Washington Press Club.

http://thehill.com/opinion/national-security/364239-It%27s-time-for-a-military-solution-to-North-Korea

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APPS Policy Forum (Canberra, Australia)

Nuclear Risk in Asia: How Australia Should Respond

By Richard Brabin-Smith

December 11, 2017

Would a change in Australia's nuclear policy be justified?

Like the poor, the risks of nuclear warfare are always with us and, in some respects, are getting worse. The hope of global nuclear disarmament remains a delusion and while there have been only a few examples of nuclear proliferation, it has nevertheless occurred. The activities and ambitions of North Korea are particularly worrying.

In this essay, I review Australia's options for responding to nuclear risk in Asia, drawing in part on the sources and recollections of various present and former colleagues including Emeritus Professor Paul Dibb, Dr Stephan Frühling, Mr Ross Thomas, Mr James Nockels and Mr Anthony Pratt. The nature of the issue means it is not appropriate to deal in absolutes. It is better instead to think in terms of risk management, and the steps that Australia should take to help reduce or contain the risk that nuclear weapons might be used.

For many years, Australia has contributed to the stability of the nuclear balance between the United States and Russia, particularly through its involvement in the Defense Support Program (DSP) of

the US Air Force. Australia's 1987 Defence White Paper (DWP) made an important public statement as to why the Australian-US joint defence facilities have been so critical:

The DSP "would provide the United States with its earliest warning of intercontinental ballistic missile (ICBM) attack. The additional warning time assists in minimising the risk of nuclear conflict arising through accident or miscalculation, and so supports stability in the superpower strategic relationship… The presence in Australia of [the facilities at Nurrungar and Pine Gap] carries with it a risk that, in the event of superpower conflict, the facilities might be attacked by the Soviet Union.

"However, the risk that such conflict might occur, either deliberately or as a result of some accident, is very low and the functions carried out by the joint defence facilities help to ensure that this remains the case. Were Australia to cease our cooperation in the joint defence facilities there would only be adverse consequences for international security and higher risk of global war."

In contrast, Australia's 2016 Defence White Paper says only that "The Joint Defence Facility Pine Gap makes a critical contribution to the security interests of Australia and the United States.

In the 30 years since publication of that White Paper, the Soviet Union has evolved into Russia, the functions of the former Joint Defence Facility at Nurrungar in South Australia have been replaced by a Relay Ground Station collocated with the Joint Defence Facility at

Pine Gap, and the technical capabilities of the DSP have developed further, including through improvements to the infra-red satellites.

Nevertheless, the need to ensure stability in the nuclear balance between the US and Russia remains. Both sides continue to maintain large and sophisticated nuclear arsenals and delivery systems, and while the relationship is not as fraught as during the Cold War, it nevertheless remains tense. Because of its critical contribution to this stability, Australia should continue to host the facility at Pine Gap, at least for as long as the US has technical and policy reasons to continue with the arrangement.

It is only a small extrapolation to extend the US-Russia argument to the situation with respect to the US and China. China's nuclear arsenal is not yet as formidable as Russia's and the relationship with the US, though difficult at times, is not as poisonous. Nevertheless, in the decades ahead, it is likely that China's military capabilities will grow extensively, bringing a need to ensure the same kind of nuclear stability as with Russia. In brief, for as long as it continues to host the Relay Ground Station, Australia should contribute to this aspect of nuclear stability too.

From an Australian point of view, the case of India and Pakistan calls for a different judgement. At least for now, their respective nuclear capabilities are likely to remain modest, and their strategic focus is more on each other than elsewhere. Other nations are better placed than Australia to emphasise to India and Pakistan the critical importance of understanding each other's perspectives and where the red lines are – those activities which if undertaken or perceived to be likely, would lead to the use of nuclear weapons, either in response or pre-emptively.

Nevertheless, Australia should take any opportunities that might arise to contribute to international efforts to help India and Pakistan keep their relationship stable. India's relationship with China, while tense in some respects, is more stable and better managed than that with Pakistan, leading to fewer challenges with respect to the nuclear dimension of the relationship.

It is in the North Pacific that the greatest cause for concern is currently to be found. Two issues intersect: the ambitions of North Korea and the robustness of the commitment of the US to extend its nuclear deterrent to its Pacific allies – South Korea, Japan and Australia.

The many aberrant behaviours of the regime in North Korea include what seems to be a non-negotiable commitment to the development of its own nuclear weapons and intercontinental

ballistic missiles to deliver them, bringing the capacity to target US islands in the Pacific, at least parts of the American continent and Australia. Setting aside the opacity of US President Donald Trump's views of his country's role in the world, the concern with the US is that, as its power and influence relative to China reduce, so too will the strength of its commitment to its allies.

What, if any, are the limits to North Korea's nuclear ambitions? Will it attempt to develop nuclear forces of the same sophistication as those of the superpowers, with decoys and multiple, independently-targeted re-entry vehicles, and a numerically significant arsenal? Such a force would be difficult to defend against and would be capable of inflicting lasting damage on the US or other target countries, with Japan a particular example. At what stage would countries currently under the protection of the US' extended nuclear deterrent start to have sufficient reservations concerning the strength of that commitment for them to decide to develop their own nuclear weapons?

These are not easy questions to address, not least because we have been fortunate not to have experienced the use of atomic or nuclear weapons since the Second World War, and therefore have no precedents to use in making these assessments.

In Australia's case, the 2016 DWP makes a brief but significant reference to the importance to us of extended deterrence: "Australia's security is underpinned by the Australian, New Zealand, United States (ANZUS) Treaty, US extended deterrence and access to advanced US technology and information. Only the nuclear and conventional military capacity of the US can offer effective deterrence against the possibility of nuclear threats against Australia." This policy of relying on the US for nuclear deterrence is long-standing, and is the context in which Australia's interests in its own nuclear weapons have long been set aside.

Australia has a chequered and complex history on the matter of nuclear weapons. There was significant interest in acquiring an Australian nuclear arsenal in the 1950s, 60s and into the early 70s, although the strength of that interest seems to have fluctuated over the period. In any event, such momentum as there was to go down the nuclear path seems to have abated quite quickly from beyond the early 1970s, especially once Australia had ratified the Nuclear Non-Proliferation Treaty (NPT) in 1973.

Instead, the focus turned to the need to understand the lead time for a nuclear capability and what might need to be done to shorten it. The 1976 Australian Strategic Analysis and Defence Policy Objectives (at the time classified Secret Austeo) expressed it as follows:

"No requirement is seen for Australia now to acquire nuclear weapons. However, the possible requirement to keep the lead time for Australia matched with contingent developments in other relevant countries, calls for keeping up-to-date in developments and for a review periodically of Australia's potential for development of nuclear weapons, against the possibility that the country might be forced to consider turning to them for protection at some indeterminate time in the future."

This is a more subtle thought than that which was expressed publicly at the time in the 1976 DWP: "Australia is a member of the Nuclear Non-Proliferation Treaty, which forbids manufacture or transfer of nuclear weapons."

It appears that, in accordance with the views expressed above, at least some work was done in the 1970s on the nuclear lead time. This study would most likely have been highly classified and not widely circulated – thus contributing to its almost complete erasure from today's corporate memory. As far as I am aware, there were no follow-up studies in later decades. Work conducted some 40 years ago in such a highly technical field would by now be out of date, given scientific developments and changes in the capabilities of Australian research institutions and industry since then.

Current circumstances do not justify the degree of strategic pessimism that would be needed for Australia to have serious doubts about extended deterrence. Nevertheless, if the government were to have or to develop such concerns, a review of this earlier work would be a good place to start, if only to inform judgements on the size of the challenge, including the investment and other resources that would be needed, and to disabuse any optimists that the path would be easy. A new study could then offer a more contemporary assessment of the costs, lead times, and the steps which could be taken to shorten the lead time.

The change in circumstances that would persuade Australia to go down the nuclear path would likely persuade other nations to do the same; Japan, but also South Korea and perhaps Taiwan, and Indonesia in the longer term. Proliferation on this scale would introduce new complications and instabilities into the international relationships of our region, increasing the risk that nuclear weapons would be used, including by accident or gross miscalculation. It would be far better for the international system to evolve in such a way that confidence in extended deterrence continued to be justified and that the need for proliferation, including by Australia, did not arise. Continued economic and diplomatic pressure on North Korea would help in this respect, even though the prospects of getting that country to change its policies are unpromising.

What, then, is the priority for Australia to acquire its own defence against attack by ballistic missiles? It is difficult to conclude that the need is pressing. If Australian forces deployed overseas were at risk of such an attack, it is most likely that we would be supporting an operation led by the US, and it is reasonable to presume the US would be providing any necessary ballistic missile defence. As in the first Gulf War, Australia would expect to be involved in providing early warning of missile attack through its participation in the DSP.

In the case of the Australian continent, the key issue is whether North Korea would expend (or waste) any of the small number of missiles in its inventory by attacking a distant target of, at best, secondary relevance to its principal concerns. Sydney is a long way from Pyongyang, and my own imagination does not yet stretch that far.

Nevertheless, given the trends in Australia's geo-strategic circumstances, there is something to be said for taking steps now to understand the options and reduce the acquisition lead times.

The government's recent decision to acquire the Aegis combat management system for the nine Future Frigates, as well for the three Air Warfare Destroyers currently under construction, is an important step in this regard, as it would facilitate the later fitting of these vessels with the Standard Missile (SM)-3 missile for the mid-course interception of longer-range ballistic missiles and the SM-6 for interception in the terminal phase, as set out by Australian Prime Minister Malcolm Turnbull at the 2017 Pacific International Maritime Exposition.

Defence against ballistic missiles is technologically challenging and the focus of much continuing development. Few, if any, systems can yet be said to be mature. There is no need to rush into a decision now, although Australia's Department of Defence needs to keep a close eye on lead times.

It is difficult, if not impossible, to imagine the catalyst that would be needed to ensure global nuclear disarmament. It is important, however, for Australia to continue to contribute to counter-proliferation initiatives and to play our part in strengthening the international norms that discourage proliferation. Without constraint on proliferation, our world would be a far riskier place. We owe it to the world and ourselves to help keep these risks as manageable as possible.

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World Economic Forum (Geneva, Switzerland)

Asia in the 'Second Nuclear Age' – Assessing the Risks of a Nuclear Exchange

By Gaurav Kampani and Bharath Gopalaswamy

November 24, 2017

It is now a truism among foreign and defence policy practitioners that the post-Cold War nuclear build-up in the Indo-Pacific region constitutes the dawn of the "second nuclear age", argues the Atlantic Council's report, Asia in the "Second Nuclear Age".

From the 1990s onward, China's decision to stir out of its strategic languor and modernize its nuclear arsenal, along with the resolve of India and Pakistan to deploy operational nuclear forces, and, more recently, North Korea's sprint to develop reliable long-range nuclear capabilities that can credibly threaten the continental United States, has led many to aver that the second nuclear age will rival the worst aspects of the first.

During the first nuclear age, baroque nuclear arms build-ups, technical one-upmanship, forward deployed nuclear forces, and trigger-alert operational postures characterized the competition between the superpowers and their regional allies. The nuclear rivals embraced nuclear war-fighting doctrines, which internalized the notion that nuclear weapons were usable instruments in the pursuit of political ends, and that nuclear wars were winnable.

Two rivalries

There is a sense of déjà vu among nuclear pessimists that nuclear developments in China, India, and Pakistan could produce similar outcomes. When North Korea's nuclear advances are factored in, the prognoses become even direr. More specifically, the second nuclear age consists of two separate systems of nuclear rivalry, with potentially dangerous spillover effects.

The first rivalry is centred on India, Pakistan, and China, with a geographic footprint that overlays the larger Indo-Pacific region. The second rivalry encompasses the Northeast Pacific, overlaying the Korean peninsula, Japan, and the United States. North Korean developments, and a potential US overreaction to them, threaten China's historic nuclear minimalism and its own interests as an emerging global power.

Similarly, US suggestions of global retreat, and the retraction of extended deterrence guarantees to its allies in Northeast Asia, could push those allies to acquire independent nuclear arsenals and intensify the second nuclear age.

Splendid first-strike

Until very recently, the threat of a nuclear war was thought most likely in South Asia, where India and Pakistan are involved in a festering low-intensity conflict (LIC) fostered by deep conflicts about identity and territory. Specific dangers include Pakistan's threats to deploy tactical nuclear weapons in a conventional war with India. Likewise, India's investments in ballistic-missile defences (BMD) and multiple-re-entry vehicle (MRV) technology could, in theory, afford future decision-makers in New Delhi the means to execute splendid first-strike (a counterforce attack intended to disable the opponent's nuclear capacity before it is used) options against Pakistan.

Prognoses of the nuclear rivalry between India and China are generally less threatening. But, when the latter rivalry is considered in the context of ongoing boundary disputes between New Delhi and Beijing, their self-identification as great powers accounting for nearly 50% of global gross domestic product (GDP) by mid-century, their participation in regional balance-of power-systems, and potential operational brushes between sea-based nuclear forces forward deployed in the Indian Ocean, those concerns invariably overshadow any optimism.

Asia's nuclear future

In the background of the unfolding gloom of the second nuclear age, the Atlantic Council's South Asia Center conducted three workshops in India, Pakistan, and China in the fall of 2016, with the objective of drawing academics, policy practitioners, and analysts in each country to discuss the unfolding nuclear dynamics in the region. All three workshops had a common theme: Assessing Nuclear Futures in Asia.

Under this umbrella theme, workshop participants tackled three specific subjects:

- The general nature of the strategic competition in Indo-Pacific region;
- The philosophical approaches shaping nuclear developments in China, India, and Pakistan;
- The hardware and operational characteristics of their nuclear forces.

The report Asia in the "Second Nuclear Age" presents the findings of the three workshops, in separate sections on China, India, and Pakistan.

What stands out in these findings is that regional participants generally reject the nuclear pessimism in Western capitals. The nuclear "sky is falling" argument, they maintain, is simply not supported by the evidence, at least when evidence is embedded in its proper context.

Key Conclusions

• While the first nuclear age was riven by deep ideological conflicts between two contrarian political systems that viewed the victory of the other as an existential threat, the nuclear rivalry between China, India, and Pakistan is nothing like that.

All three states accept the legitimacy of the international system, to the extent that they share goals of market capitalism, state sovereignty, and multilateral institutionalism. Undoubtedly, the three states have different domestic political systems: authoritarian capitalist (China), liberal democracy (India), and praetorian democracy (Pakistan). Yet, none of these nuclear powers views the domestic political system of another as jeopardizing its own existence.

• At least two among the three nuclear powers – China and India – have vast strategic depth, excellent geographical defences, and strong conventional forces. Neither fears a conventional threat to its existence. Leaderships in both countries have a shared belief that nuclear weapons are political weapons whose sole purpose is to deter nuclear use by others. They also share a common institutional legacy of civilian-dominated nuclear decision-making structures, in which the military is only one partner, and a relatively junior one, among a host of others.

All three factors – the structural, the normative, and the institutional – dampen both countries' drives toward trigger-ready, destabilizing, operational nuclear postures that lean toward splendid first-strike options.

• However, this reassurance does not extend to Pakistan, which – due to the lack of geographic depth and weaker conventional forces against India – has embraced a first-use nuclear doctrine.

Pakistan's hybrid praetorian system also allows its military near autonomy in nuclear decision-making. This combination of structural and institutional factors has led Pakistan to elect a rapidly expanding nuclear force that, within a decade, could rival the British, French, and Chinese arsenals in size, though not in sophistication.

Evidence also suggests that Pakistan has developed tactical nuclear weapons, although it does not appear to have operationalized tactical nuclear warfare.

• In the nuclear dynamic in the Indo-Pacific region, India and Pakistan are novice developers of nuclear arsenals; the weapons in their inventory are first-generation fission weapons. Likewise, their delivery systems are the first in the cycle of acquisitions. Their hardware acquisitions

generate outside concern because of the scope of their ambitions. Both nations plan to deploy a triad capability.

Nonetheless, this ambitious goal and the selection of technologies underline the central lesson of the nuclear revolution, which is force survival (to enable an assured second-strike capability).

China's goal

• Force survival through secure second-strike capabilities is also China's goal. It is the only nuclear power among the three that is actually modernizing, i.e., replacing ageing delivery systems with newer and better designs.

Thus far, the evidence suggests that Chinese and Indian explorations of multiple-re-entry vehicle technologies are aimed at reinforcing deterrence through the fielding of more robust second-strike capabilities. This conclusion is also supported by the fact that neither India nor China has, nor is developing, the ancillary intelligence, surveillance, and reconnaissance (ISR) systems necessary to execute splendid first-strike attacks.

Another technology of concern is missile defence. India's goals vis-à-vis missile defence are still unclear, and its technical successes with the programme are even less evident. Chinese goals are similarly unclear, and appear to be exploratory means for defeating adversarial attempts to stymie its deterrent capability.

• On a more positive note, neither India nor Pakistan is conducting nuclear tests to develop or improve designs for nuclear warheads. The same holds for China. However, Pakistan is rapidly accumulating fissile material, which could increase to four hundred and fifty kilograms of plutonium, sufficient for ninety weapons, and more than 2,500 kilograms of highly enriched uranium (HEU), sufficient for one hundred simple fission warheads by 2020.

India's warheads

India is accumulating approximately 16.6 kilograms of fissile material annually, sufficient for a force of approximately 150-200 warheads, though all fissile material is probably not converted into nuclear warheads.

China, however, is no longer producing fissile material. It is only modestly increasing the size of its arsenal, from 264 to 314 warheads. The size of the Chinese, Indian, and Pakistani arsenals will remain a function of the calculations of damage ratios that each believes essential to achieve deterrence. Yet, if current trends remain stable, the size of their arsenals should remain comparable to the French and British nuclear arsenals. The arsenals will be large, but will by no means approach the gargantuan size of the US or Russian nuclear arsenals.

• Like other regional nuclear powers during the first nuclear age, China, India, and Pakistan might also decide to forego one or more vulnerable legs of their nuclear triad. At present, however, there are no indicators of this happening.

• The nuclear rivalry in South Asia remains ominous, because Pakistan wages LIC against India via non-state actors, while the latter has devised limited conventional-war options to punish the Pakistani military on Pakistani soil. India has also recently hinted that it could abandon nuclear no first use (NFU) in favour of splendid first-strike options. Simultaneously, however, India is backing away from its purported limited-conventional-war doctrine against Pakistan, on the premise that the LIC does not represent an existential threat to Indian security, and that there are other sophisticated methods for dealing with Pakistan's aggressions that don't involve pressing nuclear buttons.

The decline in India's appetite for limited conventional war against Pakistan, if institutionalized over time, would represent a game changer and significantly reduce the risk of nuclear war in the region.

• The big difference between the first and second nuclear ages is the domestic stability of the nuclear-weapon powers. For the greater part of the first nuclear age, states that wielded nuclear arsenals were stable and boasted strong governing institutions.

In Asia – while China and India represent this continuity of strong state institutions, as well as checks and balances on the military – Pakistan remains internally unstable, and increasingly unable to rein in praetorianism over national security and nuclear policy.

https://www.weforum.org/agenda/2017/11/asia-in-the-second-nuclear-age-assessing-the-risks-of-a-nuclear-exchange

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Real Clear Defense (Washington, DC)

Missile Defense Cooperation – Do the Right Thing

By Ralph Jodice

December 8, 2017

"Fire with courage for the party and country!" This was the command North Korea's leader, Kim Jong-un, issued before a recent launch of a ballistic missile test.

If Kim Jong-un issued that same command for a real launch of a missile aimed at the United States, or one of its allies, would he hesitate knowing there is an integrated, credible and capable missile defense system on the other end? Would he, or another nation state or non-nation state, be willing to waste that shot knowing the chances of it reaching its intended target were minimal?

If North Korea decides to take that shot, the U.S. and our allies must be certain we possess a comprehensive missile defense architecture capable of destroying an incoming missile and its potentially nuclear-armed warhead.

Consider our near-peer competitors Russia and China. Both countries employ significant anti-access, anti-denial capabilities. They understand robust air and missile defense capabilities provide a safety umbrella from which they can operate and allows for the protection of their high-value assets. In any exercises we conduct against these integrated systems, we continue to see just how hard of a nut this is to crack. Can they say the same about our and our allies' missile defense architectures?

As a nation, the United States continues to make enormous investments in missile defense, and protection of our homeland is obviously our responsibility. However, when it comes to protecting other countries, our allies and partners need to share the burden of providing missile defense protection.

The Department of Defense is conducting the Ballistic Missile Defense Review to ensure the United States' policies for protecting our nation, our deployed forces, our allies and our partners around the globe are firmly established. The review will set the direction for the U.S. missile defense efforts for the Administration, and will likely result in far-reaching implications for the security of the United States and our allies.

What is needed for this review is a commitment by our allies for effective regional security architectures. When Admiral Syring, then-director of the Missile Defense Agency, testified before Congress, he stated; "The investments of our allies and partners in their own missile defense capabilities allows us to build more effective regional security architectures that complement the U.S. regional missile defense capabilities."

Some allies and partners are making significant investments in missile defense and are working closely with the U.S. to integrate those capabilities. Romania recently signed an agreement with the U.S. government for an integrated air and missile defense system. Romania is a much-needed addition joining other NATO countries to provide air and missile defense for Europe and the Alliance. However, the Alliance is not there yet. Given the number of Russian and Iranian missiles which could threaten Europe, more of our allies should be making similar investments in their security.

The situation in the Persian Gulf region is no different with the Iranian threat at very close range. In 2016, the Missile Defense Agency completed a Ballistic Missile Early Warning Study report for the Gulf Cooperation Council. Today, they are only "continuing to discuss" the issues instead of implementing appropriate sensor and C4I (Command, Control, Communications, Computers, and Intelligence) options for defense of the region.

In the absence of credible missile defense systems, our allies would be defenseless against ballistic missile attacks. Countries like Iran and North Korea, and even China and Russia, would know they could coerce our allies by holding high-value targets, like cities and infrastructure, at risk.

Despite the talk, the United States still provides the vast majority of the capability. There is critical work required to integrate the systems into an effective regional architecture. By networking allied sensors and interceptors with those of the U.S., everyone will receive far superior missile defense protection. Now is the time to push our allies and partners to make this a reality.

Saying the right things about missile defense by the U.S. and our allies is one thing. However, what really needs to be done is to do the right things. As a Commander I would often deliver this message: DO the right thing, DO the right things right, and DO the right things right for the right reasons.

What is the right thing to do? Be more aggressive in making effective regional missile defense architectures, which includes making significant allied investments a reality.

If any bad actor on the world stage issues the "fire with courage" command for real, there will be only seconds to react and no second chance. There must be a completely integrated, capable, and credible missile defense system ready and fully functioning on our side. One which the U.S., its allies, its partners, and its friends all trust and know will destroy an incoming ballistic missile.

https://www.realcleardefense.com/articles/2017/12/08/missile_defense_cooperation__do_the_right_thing_112752.html

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ABOUT THE USAF CUWS

The USAF Counterproliferation Center 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 Director for Nuclear and Counterproliferation (then AF/XON), now AF/A5XP) and Air War College Commandant established the initial manpower 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.

The Secretary of Defense's Task Force on Nuclear Weapons Management released a report in 2008 that 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." As a result, 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 continuing education through the careers of those Air Force personnel working in or supporting the nuclear enterprise. This mission was transferred to the Counterproliferation Center in 2012, broadening its mandate to providing education and research to not just countering WMD but also nuclear deterrence.

In February 2014, the Center's name was changed to the Center for Unconventional Weapons Studies 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.

The CUWS'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.