UNITED STATES AIR FORCE

CENTER FOR STRATEGIC DETERRENCE STUDIES

NEWS AND ANALYSIS

Issue 1402
31 January 2020

Feature Report

"*Extended Deterrence and Strategic Stability in East Asia: AY19 Strategic Deterrence Research Papers (Vol I), 2019*". Edited by Dr. Paige Cone, Dr. James Platte, and Dr. Lewis Steinhoff. Published by U.S. Air Force Center for Strategic Deterrence Studies; Jan. 17, 2020

https://www.airuniversity.af.edu/CSDS/Display/Article/2060146/extended-deterrence-and-strategic-stability-in-east-asia-ay19-strategic-deterre/

The Air University Deterrence Research Task Force, composed of Air War College and Air Command and Staff College students, developed a series of papers in response to research questions from the commander, Air Force Global Strike Command, and the Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration in 2019. The papers deepen last year's research on East Asia topics as well as reviewing NNSA and AI issues. This collection of papers represents ongoing critical thinking on strategic policy issues conducted at Maxwell Air Force Base, Ala.

TABLE OF CONTENTS

NUCLEAR WEAPONS

Air Force Magazine (Arlington, Va.)

Strategy and Policy

By John A. Tirpak

Feb. 1, 2020

The US can postpone modernizing its nuclear deterrent forces no longer. The triad of delivery systems, the warheads, the scientific infrastructure that builds and tests them, and the command and control system that ties it all together, have all long outlived their planned service lives. Now comes the task of convincing the public this massive recapitalization must somehow be afforded, among many other national priorities.

"We are out of margin, and we are out of time," said retired USAF Gen. C. Robert Kehler, former commander of US Strategic Command, at a December MITRE Corp. seminar. "We have deferred modernization as long as we can defer it." The last—partial—recapitalization of the nuclear deterrent was 30 years ago, and many of the systems, such as the B-52 bomber, are more than 50 years old.

A newly released RAND report—completed for the Air Force in 2018 but not publicly released until November 2019—warns the service must step up advocacy for strategic modernization or risk seeing existing infrastructure fail. RAND said the Air Force should spell out in detail its master plans for replacing land-based ICBMs, bombers, and the nuclear command and control (NC2) system, which is sometimes referred to as the "fourth leg" of the nuclear triad.

The "sheer scale of the programs is daunting, has not been performed at scale for many decades, and will need to be relearned," said RAND.

The B-52 bomber, KC-135 tanker, AGM-86B Air-Launched Cruise Missile, and Minuteman III ICBM all date from the 1960s and 70s, Kehler said—well before the last modernization of the nuclear force. The information technology system tying it all together "aged out 30 years ago," he said.

Meanwhile, Russia and China have "modernized—past tense," Kehler stated. Their nuclear arsenals are fresh and the rapid buildup of the Chinese military has shifted the strategic landscape from a bipolar to multipolar world. "Further delay is just going to add risk," he asserted.

Trillion with a 'T'

The Congressional Budget Office said in 2017 that the cost of modernizing and operating the nuclear deterrent enterprise for the 30 years through 2046 would reach $1.24 trillion. Of that, $399 billion would fund buying or updating nuclear forces and $843 billion would fund operations and sustainment. Parsed another way, the Defense Department would spend $890 billion while the Department of Energy would invest $353 billion to support scientific infrastructure.

"This is not the Cold War," Kehler said: The world situation is very different than when the Soviet Union collapsed in 1991. "We are facing a new set of uncertainties and global challenges that we have not faced before." In addition to strategic nuclear weapons, the US faces cyberattacks and other threats "below the threshold" of a nuclear strike. That demands new strategy, new long-range conventional weapons, missile defenses, and assurance that the bedrock systems will all function properly when needed, he said.

Nuclear weapons underpin all other aspects of national security, Kehler said, and play a central role whenever diplomacy and military action are considered.

"In cases like Iran, [the threat of nuclear weapons is] being used by a country that doesn't even have them," he said.

Peter Fanta, deputy assistant secretary of defense for nuclear matters, said the US stopped designing, building, and testing nuclear weapons in 1992, "and the rest of the world did not."

The weapons development complex was built in the 1940s through 1960s and has not been upgraded, he said. The engineers and scientists who designed the nuclear weapons built in the 1980s "are now retiring or dead."

Demand Signal

The US must build a minimum of 80 "pits" a year, referring to the core of a nuclear warhead, which resembles a peach pit, and is essentially a plutonium sphere surrounded by a reflective explosive shell.

"Why 80 pits per year? It's math," he said. "Divide 80 by the number of warheads we have—last time it was unclassified, it was just under 4,000—and you get a time frame," Fanta said.

At only 30 pits per year, it would take until 2150 to upgrade the US nuclear stockpile—"after your children's children are retired," he said. The National Nuclear Security Administration says its facilities at Los Alamos, N.M., have the capacity for 30 pits a year, while those at Savannah River, near Aiken, S.C., have capacity for 50.

Exacerbating the problem is the question of how long each pit remains viable. Plutonium "is warm and, over time, it can deform what's around it," one expert told Air Force Magazine, and the plutonium itself will eventually transmute into uranium, devolving into "something that doesn't produce the desired effect or expected yield."

Fanta said, "There's disagreement on whether they're good for 100 years. … But we're beyond that at this point. At 80 pits a year, we'll have 100-year-old components by the time we replace those. … We need to stop arguing about it and get on with it."

Swapped Doctrine

The US countered Russia's overwhelming Cold War conventional advantages with nuclear weapons, Fanta said. Today, "the shoe is on the other foot."

Russia is rapidly developing "underwater nuclear-powered weapons, hypersonic cruise missiles, and cruise missiles powered by nuclear reactors." Why? "It's a challenge for our conventional forces … an asymmetric threat," Fanta said. "It's our doctrine, swapped."

The strategy, he explained, is a "reasonable way to rapidly close the gap against a larger, conventionally superior force."

China, meanwhile, has also learned from watching the US. Still smarting over its inability to repel the US from the Taiwan Straits in the 1990s, China is now "outbuilding us 10-to-1" in conventional forces and "on the nuclear side, they are improving every capability they have," Fanta said. That includes road-mobile ICBMs, advanced submarines, and ballistic missiles.

While "we've been discussing this for two decades, talking about pit production in the US, they were building," Fanta continued. Now, to replace the Minuteman III with the Ground-Based Strategic Deterrent will take "one GBSD missile built, shipped, installed, tested, and made operational every week for almost 10 years."

The Navy's Ohio-class ballistic missile submarines are also aging out. The Ohio-class subs, designed to serve 30 years, are being extended to 42 years, when they will be retired in favor of the new Columbia-class boats, according to the Congressional Research Service. But those "tin cans," as Fanta characterized them, can only "squish back and forth" so many times under the pressure of deep submergence. "We need to … stop doing unnatural acts to keep the submarines going more than 42 years and start building now."

The risks today are greater because none of the triad systems were upgraded in a timely fashion, said Deputy STRATCOM Commander Vice Adm. David Kriete.

"If we're going to defend the country, we must remain a nuclear power," Kriete insisted. "If we're going to remain a nuclear power, that demands that we get on with our modernization plan right now."

Air Force Lt. Gen. Richard M. Clark, director of USAF strategic deterrence and nuclear integration on the Air Staff, said James Mattis came into office as Defense Secretary in 2017 openly wondering whether a "dyad" of sub-launched missiles and bombers was sufficient. He left convinced that the triad is the right solution, concluding, "America can afford survival."

The numbers matter, Clark said. Having 400 ICBMs compels an enemy to hit every one if a nuclear first strike is to be successful; without them, however, the US nuclear enterprise could be crippled "with about 10 strikes: You could take out our two sub bases, our three bomber bases, STRATCOM, the Pentagon, and our three labs … Los Alamos, Sandia, and Livermore."

Hit those 10 targets and "our nuclear enterprise would be devastated," he said.

Yet as dire as it seems, GBSD won't be accelerated. "We are pushing it about as fast as we can go," he said. Rather than accelerating GBSD, "We're looking at every way we can to keep Minuteman III viable, reliable, and survivable," Clark said. "You can only get so much out of maintenance; it's such an old system."

World War II-Era

Charles Verdon, deputy administrator of defense programs for the NNSA said aging infrastructure is not limited to weapons.

The NNSA is the nation's nuclear weapons industrial base, having to "renew critical manufacturing facilities to ensure we have the materials necessary to ensure warhead delivery," he said.

Yet, "Many of our critical facilities actually date back to the Manhattan Project." Now, for example, the agency is trying to "put modern earthquake standards into a building built in 1945-1947," according to Verdon.

A new building might be better, but it could take a decade for it to become productive.

The NNSA believes it needs to build 80 pits a year by 2030 to keep the warheads safe and "address the age of the systems that are presently there." This number is deemed enough to "smoothly and methodically address the current pits/plutonium cores … over time, and respond to peer competition … or to meet a new military requirement," he said. The longer the delay, though, the more pits that will be needed per year.

Making the Case

William LaPlante, former Air Force acquisition chief and now MITRE vice president for its national security sector, said the conference was designed to stimulate a national discussion on the need for nuclear modernization. To that end, it was cosponsored by George Washington University's School of Media and Public Affairs.

"Since the fall of the Berlin Wall and certainly after 9/11, nuclear matters have not gotten much attention," LaPlante said. "There deserves to be a better understanding by the American public."

Frank Sesno, director of the GWU's media school and a former CNN correspondent, said in past decades, when the Intermediate-range Nuclear Forces and START treaties were major news events, "there was never a problem, as a reporter … getting a story about nuclear weapons or readiness or preparedness on the air or into print."

That's no longer the case, he said. Yet the public still needs to be engaged. "What is the investment? Toward what end?"

For Fanta, that end is clear: "Getting the entire nation to understand the world has changed, and we need to do things differently." That's a big challenge in itself, across the country and on Capitol Hill. "There's change, there's risks, and we need to address them."

https://www.airforcemag.com/article/strategy-and-policy/

Return to top

Small Wars Journal (Bethesda, Maryland)

United States Nuclear Strategy: Deterrence, Escalation and War

By Louis René Beres

War is a matter of vital importance to the State; the province of life or death; the road to survival or ruin. It is mandatory that it be thoroughly studied.

--Sun Tzu, The Art of War

Introduction

On January 23, 2020, the Bulletin of the Atomic Scientist's Doomsday Clock - a respected visual metaphor of current nuclear dangers - was moved in a worrisome direction. More exactly, the hands of the clock were changed from two minutes to midnight to 100 seconds to midnight. In their correspondingly released press release, Bulletin editors explained soberly that they had moved the clock 20 seconds closer to midnight ("closer to apocalypse than ever before") for the following reason: "A new willingness of political leaders to reject the negotiations and institutions that can protect civilization over the long term." Ominously, the release continued: "....board members are explicitly warning leaders and citizens around the world that the international security situation is now more dangerous than it has ever been, even at the height of the Cold War."

These were not by any means just casual assessments. For the United States, North Korea and Iran currently represent the most obvious nuclear threat hazards, although Iran is not yet nuclear.

Iran does remain capable of fighting a genuinely massive conventional conflict. It could at some point bring the United States to consider using some of its own nuclear forces. At the same time, certain Sunni Arab states increasingly worried about an impending "Persian bomb" could soon seek a countervailing nuclear capacity for themselves.[i] In this significant connection, both Egypt and Saudi Arabia come most immediately to mind. So what happens next?

To reply meaningfully, fully continuous US attention must be directed toward ongoing nuclear developments in Russia and China. As we are very plainly in the midst of a second Cold War (i.e., "Cold War II"), these ongoing Russian and Chinese nuclear developments effectively provide the broader systemic context for "nuclear" developments underway in Pyongyang and Tehran. In

essence, "Cold War II" represents the comprehensive systemic structure within which all contemporary world politics must be assessed.[ii]

In other words, current Great Powers' disposition to war is background.

Accordingly, what explanatory theories and scenarios should best guide the Trump administration in its many-sided interactions with North Korea, Iran, China and Russia? Before answering this basic question with adequate and clarifying specificity, a "correct" answer - any correct answer - must depend upon a single overarching assumption. This is the inherently problematic assumption of adversarial rationality.

It follows, among other things, that a primary "order of business" for those American strategic analysts and planners focused on this most urgent set of security problems will be reaching informed judgments about each pertinent adversary's expected ordering of preferences. By definition, only those identifiable adversaries who would value national survival more highly than any other preference or combination of preferences would be acting rationally.

Rationality, Irrationality and Madness

Some further basic questions now arise. First, what are the relevant terms or inclusive vocabularies? In the study of international relations and military strategy, decisional irrationality never means quite the same as madness. Nonetheless, residual warnings about madness should still warrant serious policy consideration. This is because both "ordinary" irrationality and full-scale madness could have comparable and consequential effects upon any relevant country's national security decision-making processes.

Sometime, for the United States, understanding and anticipating these more-or-less ascertainable effects could display an authentically existential importance. In these considerations, words matter. In normal strategic parlance, "irrationality" identifies a decisional foundation wherein national self-preservation is not summa, not the very highest and more typically ultimate preference. A prospectively irrational decision-maker in Pyongyang, Tehran or elsewhere need not be altogether "mad" in order to become troubling for our designated leaders in Washington. Such an adversary needs "only" to be more conspicuously concerned about certain discernible preferences or values than about its own collective self-preservation.

An example would be expressed preferences for outcomes other than national survival. Normally, such behavior would be unexpected and counter-intuitive, but it would by no means be unprecedented or inconceivable. Moreover, identifying the specific criteria or correlates of any such considered survival imperatives could prove irremediably subjective and/or indecipherable.

Whether any examined American adversary were deemed irrational or "mad," US military planners would have to input a generally similar decisional calculation. The analytic premise here would be that the particular adversary "in play" might not be suitably deterred from launching a military attack by any American threats of retaliatory destruction, even where such threats would be fully credible and presumptively massive. Any such prospective failure of US military deterrence could include both conventional and nuclear retaliatory threats.

In fashioning America's nuclear strategy vis-à-vis nuclear and not-yet-nuclear adversaries,[iii] US military planners must include a mechanism to determine whether a pertinent adversary (e.g., North Korea or Iran) will more likely be rational or irrational. Operationally, this means ascertaining whether the identifiably relevant foe will value its collective survival (either as a state, or as an organized terror group) more highly than any other preference or combination of preferences. Always, this early judgment must be based upon defensibly sound analytic principles; they should never be affected in any tangible way by what the particular analysts might "want to believe."[iv]

Pretended Irrationality, Escalation Dominance and Dialectical Thinking

A corollary US obligation, depending in large part upon this prior judgment concerning expected enemy rationality, will expect strategic planners to assess whether a properly nuanced posture of "pretended irrationality" could enhance America's nuclear deterrence posture. On several occasions, it should be recalled, President Donald Trump had openly praised at least the underlying premises of such an eccentric posture. Was such praise intellectually warranted or justified?

US enemies include both state and sub-state foes, whether singly or in various assorted forms of collaboration. Such forms could be "hybridized" in different ways between state and sub-state adversaries.[v] In dealing with Washington, each recognizable class of enemies could itself sometime choose to feign irrationality. In principle, this could represent a potentially clever strategy to "get a jump" on the United States in any expected or already-ongoing competition for "escalation dominance."[vi]

Naturally, any such calculated pretense could also fail, perhaps even calamitously.

There is something else. On occasion, these very same enemies could "decide," whether consciously or unwittingly, to actually be irrational. In any such innately bewildering circumstances, it would become unalterably incumbent upon American planners to capably assess which particular form of irrationality - pretended or authentic - is underway. Thereafter, these planners would need to respond with a dialectically orchestrated and optimally counterpoised set of all possible reactions.

In this context, the term "dialectically" (drawn originally from ancient Greek thought, especially Plato's dialogues) is used with very precise meanings. This is done in order to signify a continuous or ongoing question-and-answer format of relevant strategic reasoning.

By definition, any instance of enemy irrationality would value certain specific preferences (e.g., presumed religious obligations or personal and/or regime safety) more highly than collective survival. For America, the grievously threatening prospect of some genuinely irrational nuclear adversary is prospectively most worrisome with regard to North Korea and at least possibly (in the now rapidly closing future) Iran.[vii] Apropos of all such credible apprehensions, it is unlikely that they could ever be meaningfully reduced by way of any formal treaties or agreements.[viii]

Here it is well worth remembering seventeenth-century English philosopher Thomas Hobbes' classic warning in Leviathan: "Covenants, without the sword, are but words...."

Preemption Options, National Security and Asymmetrical Military Power

How should the United States proceed? At some point, the very best option could seem to be some sort of preemption; that is, a defensive non-nuclear first-strike directed against situationally appropriate North Korean hard targets. Yet, it is already very late for launching any operationally cost-effective preemption against that country, and - even if it could be properly defended in law as "anticipatory self-defense"[ix] - such action would come at too-substantial human and political costs.

In specific regard to current and potentially protracted US-Iran enmity, the American side must carefully consider how, if at all, its nuclear weapons could be leveraged against that adversarial state in virtually any still-identifiable war scenario. To be sure, a rational answer could never include any actual use of such extraordinarily destructive weapons. Rather, the only pertinent questions for US planners should now concern the calculable extent to which an asymmetrical US threat of nuclear escalation could sometime be made credible.

Once again, by definition, as long as Iran remains non-nuclear, any US nuclear threat must necessarily be asymmetrical.

By applying all available standards of ordinary reason and logic (there are, after all, no usable historical points of reference in such literally unprecedented situations), Washington could best determine that certain nuclear threats against Iran would serve American security interests only when Iranian military capacities, though non-nuclear, were still convincingly overwhelming. Such a daunting scenario, though perhaps difficult to imagine, might nonetheless be conceivable - especially if Tehran were ever to escalate (a) to massive direct conventional attacks upon American territories or populations, and/or (b) to the significant use of biological warfare capabilities.

Inter alia, all this should now imply a primary obligation for the United States (c) to focus continuously on steady incremental enhancements to its implicit nuclear deterrence posture; and (d) to develop a wide and nuanced range of possible nuclear retaliatory options. The specific rationale of (d) above, is a counter-intuitive understanding that the credibility of nuclear threats could sometime vary inversely with perceived levels of destructiveness. In foreseeable circumstances, this means that the successful nuclear deterrence of Iran could actually depend upon nuclear weapons that are deemed sufficiently low-yield or small.

Washington should also continue to bear in mind any US nuclear posture's imperative focus on prevention rather than punishment. In absolutely any and all circumstances, using its own available nuclear forces for vengeance rather than deterrence would miss the principal point - which, invariably, must be to optimize US national security. Accordingly, any American nuclear weapons use based on narrowly corrosive notions of revenge, even if only as a residual default option, would be not only purposeless, but also irrational.

There is more. America's nuclear deterrent must always be backed up by recognizably robust systems of active defense (BMD), especially if there should be any determinable reason to fear an irrational nuclear adversary. Although it is well-known that no system of active defense can ever be entirely "leak-proof," there is still good reason to suppose that certain BMD deployments could help safeguard both US civilian populations (soft targets) and American nuclear retaliatory forces (hard targets).[x] This means, inter alia, that technologically advanced anti-missile systems must indefinitely remain as a steadily-modernizing component of this country's nuclear deterrence posture. Plausibly, especially following recent test successes in Israel, this means continuously expanding emphases on certain laser-based weapon systems.

Offense, Defense and US Nuclear Deterrence

While it may at first sound annoyingly obvious, it must still be remembered that in the nuclear age, seemingly defensive strategies could sometime be viewed by uneasy adversaries as offensive. This is because the secure foundation of any system of nuclear deterrence must be some reasonable presumption of mutual vulnerability.

"Everything is very simple in war," says Clausewitz, in On War, "but the simplest thing is still difficult."

To progress in its most vital national security obligations, American military planners must more expressly identify the prioritized goals of this country's nuclear deterrence posture. Before any rational adversary could be suitably deterred by an American nuclear deterrent, that enemy would first need to believe that Washington had capably maintained the capacity to launch appropriate nuclear reprisals for relevant forms of aggression (nuclear and perhaps even non-nuclear), and also the requisite will to undertake any such uniquely consequential firing.

About the first belief criterion, it would almost certainly lie "beyond any reasonable doubt."

The second expectation, however, could sometime prove problematic and thus more-or-less "fatally" undermine US nuclear deterrence

In more perplexing matters involving an expectedly irrational nuclear enemy,[xi] successful US deterrence would need to be based upon distinctly credible threats to enemy values other than national survival.

America may also need to demonstrate, among other things, the substantial invulnerability of its own nuclear retaliatory forces to any enemy first strike aggressions. More precisely, it will remain in America's long-term survival interests to continue to emphasize its assorted submarine-basing nuclear options.[xii] Otherwise, as is reasonable to contemplate, even America's land-based strategic nuclear forces could potentially present to a strongly-determined existential enemy as somehow "too-vulnerable."

For the moment, of course, this is not a significantly serious concern, though Washington will want to stay focused on any still-planned deployment of submarines by its Israeli ally in the Middle East. The point of any such focus would be on strengthening Israeli nuclear deterrence, which - in one way or another - would simultaneously be to the overall strategic benefit of the United States.[xiii]

Continuing "Deliberate Nuclear Ambiguity" or Increasing Disclosure

Increasingly, America will have to rely on a multi-faceted doctrine of nuclear deterrence. In turn, like its already-nuclear Israeli ally,[xiv] specific elements of this "simple but difficult" doctrine could sometime need to be rendered less "ambiguous." This complex and finely nuanced modification will imply an even more determined focus on prospectively rational and irrational enemies, including both national and sub-national foes.

To deal most successfully with its presumptively irrational or non-rational enemies, this country will need to compose an original strategic "playbook." Here, once again, it could become necessary for Washington to consider, at least on occasion, feigning irrationality. In such cases it would be vitally important for the American president not to react in any ad hoc or "seat-of-the-pants" fashion to each and every new strategic challenge or eruption, but instead to derive or extrapolate specific policy reactions from a suitably pre-fashioned strategic nuclear doctrine.

Without such a thoughtful doctrine as guide, pretended irrationality could become a "double-edged sword," effectively bringing more rather than less security harms to the United States.[xv]

There is one penultimate but still critical observation. It is improbable, but not inconceivable, that certain of America's principal enemies would be neither rational nor irrational, but mad. While irrational decision-makers would already pose special problems for US nuclear deterrence - by definition, because these decision-makers would not value collective survival more highly than any other preference or combination of preferences - they might still be rendered susceptible to various alternate forms of deterrence.

For example, resembling rational decision-makers, they could still maintain a fixed, determinable and "transitive" hierarchy of preferences.

This means, at least in principle, that "merely" irrational enemies could still be successfully deterred.

Mad or "crazy" adversaries, on the other hand, would have no such calculable hierarchy of preferences, and would therefore not be subject to any strategy of American nuclear deterrence. Although it would likely be far worse for the United States to have to face a mad nuclear enemy than a "merely" irrational one, Washington would have no foreseeable choice in this matter. This country, like it or not, will need to maintain, perhaps indefinitely, a "three track" system of nuclear deterrence and defense, one track for each of its identifiable adversaries that are presumptively (1) rational (2) irrational or (3) mad.

For the notably unpredictable third track, special plans will be needed for undertaking certain potentially indispensable preemptions, and, simultaneously, corresponding/overlapping efforts at ballistic missile defense.

Naturally, there could be no assurances that one "track" would always present exclusively of the others. This means, significantly, that American decision-makers could sometimes have to face deeply intersecting or interpenetrating tracks and that these complicated simultaneities could even be synergistic.[xvi]

There is one genuinely final observation. Even if America's military planners could reassuringly assume that enemy leaderships were fully rational, this would say nothing about the accuracy of the information used by these foes in making their particular calculations. Always, it must never be forgotten, rationality refers only to the intention of maximizing certain designated preference or values.

It says nothing about whether the information being used is either correct or incorrect.

Prudence, Humility and America's Nuclear Strategy

Fully rational enemy leaderships could still commit serious errors in calculation that lead them toward a nuclear confrontation or even a nuclear war. There are also some related command and control issues that could impel a perfectly rational adversary or combination of adversaries (both state and sub-state) to embark upon various risky nuclear behaviors. It follows, prima facie, that even pleasingly "optimistic" assessments of enemy leadership decision-making could never reliably preclude authentically catastrophic outcomes.[xvii]

For the United States, understanding that no scientifically accurate judgments of probability can ever be made about unique events (by definition, any nuclear exchange would be sui generis or precisely such a unique event), the best lessons for America's president should favor a determined prudence and a very deliberate posture of humility. Of special interest, in this connection, is the erroneous presumption that having greater nuclear military power than an adversary is automatically an assurance of bargaining or diplomatic success. While Donald Trump has said on several occasions that both he and Kim Jung Un have a "nuclear button," but that his button "is bigger," the president wholly overestimated the US advantages of any such US-favorable asymmetry.

Why? Because the tangible amount of deliverable nuclear firepower required for deterrence is necessarily much less than what could ever be required for "victory."[xviii]

Now, for Washington, in the largely-unpracticed nuclear age, ancient Greek tragedy warnings about excessive leadership pride are not only still relevant; they are palpably and irrefutably more important than ever before.

For the United States, these classical warnings about hubris, left unheeded, could bring forth once unimaginable spasms of "retribution."[xix] The Greek tragedians, after all, were not yet called upon to reason about nuclear decision-making. None of this culminating suggestion is meant to build gratuitously upon America's most manifestly reasonable fears or apprehensions, but only to remind everyone involved that competent national security planning remains a bewilderingly complex struggle of "mind over mind."[xx]

Always, these are fundamentally intellectual problems, challenges requiring meticulous preparation[xxi] rather than just a particular "attitude."[xxii] Above all, such planning ought never be just a calculable contest of "mind over matter,"[xxiii] never just a vainly reassuring inventory of comparative weaponization or presumptively superior "order of battle." Unless this point is more completely and quickly understood by senior US strategic policymakers, the next change of hands

on the "Doomsday Clock" (at The Bulletin of the Atomic Scientists) could take place at three seconds before midnight.[xxiv]

End Notes

[i] For earlier conceptualizations of this capacity, by this author, see: Louis René Beres, Mimicking Sisyphus: America's Countervailing Nuclear Strategy (1983) and Louis René Beres, America Outside the World: The Collapse of U.S. Foreign Policy (1987).

[ii] In late June 2019, Russia announced that current US policies concerning bilateral nuclear treaty termination and prospective US anti-missile deployments in eastern Europe could threaten "another Cuban missile crisis." This suggests that Russia is important in military nuclear terms not only for its shaping of Cold War II context, but also as a direct and increasingly immediate nuclear threat to the United States.

[iii] For a very recent analysis of deterring not-yet-nuclear adversaries in the case of Israel, see article co-authored by Professor Louis René Beres and (former Israeli Ambassador) Zalman Shoval at the Modern War Institute, West Point (Pentagon): https://mwi.usma.edu/creating-seamless-strategic-deterrent-israel-case-study/

[iv] Recall here the classic statement of Julius Caesar: "Men as a rule believe what they want to believe." See: Caesar's Gallic War, Book III, Chapter 18.

[v] This "hybrid" concept could also be applied to various pertinent ad hoc bilateral state collaborations against US strategic interests. For example, during June 2019, Russia and China collaborated to block an American initiative aimed at halting fuel deliveries to North Korea. The US-led cap on North Koreas fuel imports has been intended to sanction any continuing North Korean nuclearization.

[vi] On "escalation dominance," see recent article by Professor Louis René Beres at The War Room, US Army War College, Pentagon: https://warroom.armywarcollege.edu/articles/nuclear-decision-making-and-nuclear-war-an-urgent-american-problem/

[vii] See, also by this author, at Harvard National Security Journal (Harvard Law School): https://harvardnsj.org/2013/10/lessons-for-israel-from-ancient-chinese-military-thought-facing-iranian-nuclearization-with-sun-tzu/

[viii] See, for example, by this author, at Yale: https://yaleglobal.yale.edu/content/nuclear-treaty-abrogation-imperils-global-security

[ix] For a pertinent Israeli example, see, by this author: https://www.usnews.com/opinion/world-report/articles/2017-09-06/10-years-later-israels-operation-orchard-offers-lessons-on-north-korea

[x] On the prospective shortcomings of Israeli BMD systems, from which certain authoritative extrapolations could be made about US systems, see: Louis René Beres and (Major-General/IDF/ret.) Isaac Ben-Israel, "The Limits of Deterrence," Washington Times, November 21, 2007; Professor Louis René Beres and M-G Isaac Ben-Israel, "Deterring Iran," Washington Times, June 10, 2007; and Professor Louis René Beres and M-G Isaac Ben-Israel, "Deterring Iranian Nuclear Attack," Washington Times, January 27, 2009.

[xi] See, on deterring a prospectively irrational nuclear Iran, Louis René Beres and General John T. Chain, "Could Israel Safely deter a Nuclear Iran? The Atlantic, August 2012; and Professor Louis René Beres and General John T. Chain, "Israel; and Iran at the Eleventh Hour," Oxford University Press (OUP Blog), February 23, 2012. Though dealing with Israeli rather than American nuclear

deterrence, these articles authoritatively clarify the common conceptual elements. General Chain was Commander-in-Chief, U.S. Strategic Air Command (CINCSAC).

[xii] On the Israeli sea-basing issue, see Louis René Beres and Admiral Leon "Bud" Edney, "Israel's Nuclear Strategy: A Larger Role for Submarine-Basing," The Jerusalem Post, August 17, 2014; and Professor Louis René Beres and Admiral Leon "Bud" Edney, "A Sea-Based Nuclear Deterrent for Israel," Washington Times, September 5, 2014. Admiral Edney was NATO Supreme Allied Commander, Atlantic (SACLANT).

[xiii] See, in this connection, by Professor Louis René Beres and General (USA/ret.) Barry R. McCaffrey, Israel's Nuclear Strategy and America's NationalnSecurity; https://sectech.tau.ac.il/sites/sectech.tau.ac.il/files/PalmBeachBook.pdf

[xiv] See, by this author (who was Chair of Project Daniel for Israeli PM Ariel Sharon): http://www.acpr.org.il/ENGLISH-NATIV/03-ISSUE/daniel-3.htm See also: https://besacenter.org/perspectives-papers/israel-nuclear-ambiguity/and https://www.idc.ac.il/he/research/ips/Documents/2013/%D7%A0%D7%99%D7%99%D7%A8%D7%95%D7%AA/LouisReneBeres.pdf

[xv] This brings to mind the closing query of Agamemnon in The Oresteia by Aeschylus: "Where will it end? When will it all be lulled back into sleep, and cease, the bloody hatreds, the destruction"?

[xvi] See, for example, by this author, at Harvard National Security Journal: https://harvardnsj.org/2015/06/core-synergies-in-israels-strategic-planning-when-the-adversarial-whole-is-greater-than-the-sum-of-its-parts/

[xvii] In this connection, expressions of decisional error (including mistakes by the United States) could take different and overlapping forms. These forms include a disorderly or inconsistent value system; computational errors in calculation; an incapacity to communicate efficiently; random or haphazard influences in the making or transmittal of particular decisions; and internal dissonance generated by any authoritative structure of collective decision-making (e.g., the US National Security Council).

[xviii] See, by this author, at Oxford University Press: https://blog.oup.com/2011/10/war-winning/

[xix] For much earlier similar warnings, by this author, see his October 1981 article at World Politics (Princeton): https://www.jstor.org/stable/2010149?seq=1#page_scan_tab_contents

[xx] Clausewitzian friction refers to the unpredictable effects of errors in knowledge and information concerning strategic uncertainties; on presidential under-estimations or over-estimations of US relative power position; and on the unalterably vast and largely irremediable differences between theories of deterrence and enemy intent "as it actually is." See: Carl von Clausewitz, "Uber das Leben und den Charakter von Scharnhorst," Historisch-politische Zeitschrift, 1 (1832); cited in Barry D. Watts, Clausewitzian Friction and Future War, McNair Paper No. 52, October, 1996, Institute for National Strategic Studies, National Defense University Washington, D.C. p. 9.

[xxi] Or "thorough study," in the language of Sun-Tzu (see epigraph, above).

[xxii] The meaningless bifurcation of "attitude" and "preparation" was expressly invoked by Donald Trump before going off to his first summit meeting with North Korean leader Kim Jung Un. In that curious distinction, the US President had openly favored the former.

[xxiii] This vital reminder is also drawn from the strategic calculations of ancient Greece. See, for example, F.E. Adcock, The Greek and Macedonian Art of War (University of California, 1962).

[xxiv] Perhaps the best metaphor concerning nuclear war is its representation as "final epidemic" or "terminal disease." See, for example, Eric Chivian et.al., Last Aid: The Medical Dimensions of Nuclear War (W H Freeman, 1982) and, by this author, Louis René Beres, Apocalypse: Nuclear Catastrophe in World Politics (The University of Chicago Press, 1980). Significant, too, as nations navigate the "Trump Era," is the April 14, 1982 Camp David Address comment by US President Ronald Reagan: "A nuclear war cannot be won and must never be fought."

https://smallwarsjournal.com/jrnl/art/united-states-nuclear-strategy-deterrence-escalation-and-war

Return to top

US COUNTER-WMD

World Economic Forum (Geneva, Switzerland)

Biosecurity Innovation and Risk Reduction: A Global Framework for Accessible, Safe and Secure DNA Synthesis

Jan. 8, 2020

Since scientists demonstrated the means to create a full viral genome in 2002, DNA synthesis technologies have become increasingly available and frequently utilized by scientists and engineers around the world. These technologies support myriad advancements in synthetic biology, which offers the potential for increased efficiency and sustainability, and drives advancements in the energy, food, agriculture, health and manufacturing industries. Further advances in technology hold great promise for sustainable development and a safer and more secure society.

At the same time, new approaches to DNA editing and synthesis have made it easier to manipulate biological agents and systems, increasing the risk of a catastrophic accidental or deliberate biological event. These technologies make it possible to create pathogen or toxin DNA that could be accidentally or deliberately misused. For example, in 2018 researchers published work detailing the synthesis of horsepox virus, an extinct virus related to smallpox, using synthetic DNA fragments purchased from a commercial provider. This demonstrated the potential for creating other viruses via commercially available technologies.

Although many DNA providers practice screening procedures to help prevent the misuse of synthetic DNA, these practices are becoming increasingly expensive relative to other business costs, increasing the economic pressure to limit such voluntary procedures. As access expands and the cost of DNA synthesis declines, more DNA will be in commerce, and additional DNA providers may enter the market, further expanding the range of people using synthetic DNA. In the next two to three years, a new generation of benchtop DNA synthesis machines, enabled by enzymatic DNA synthesis methods, could become available without guidance or norms to prevent misuse.

This report, endorsed by an international expert Working Group, recommends a global system to expand synthetic DNA screening practices by developing an international, cost-effective, and sustainable mechanism to prevent illicit DNA synthesis and misuse. The new framework offers an improvement on existing voluntary guidelines because it standardizes screening processes, is accessible to new players in the market, and provides valuable feedback data to evaluate the screening – all at lower costs.

https://www.weforum.org/reports/biosecurity-innovation-and-risk-reduction-a-global-framework-for-accessible-safe-and-secure-dna-synthesis-582d582cd4

Return to top

Homeland Preparedness News (Washington, D.C.)

Nuclear Threat Initiative CEO Urges Reduction of Biological Threat Risk

By Melina Druga

Jan. 29, 2020

Nuclear Threat Initiative (NTI) CEO and Co-Chairman Ernest J. Moniz called on public and private sector leaders at last week's 50th World Economic Forum (WEF) to work to reduce the biological risks associated with advances in technology.

Safety and security measures have not kept pace with biotechnologies, and this means countries are unprepared to identify risks and prevent the deliberate or accidental release of potentially pandemic agents.

Moniz asked leaders to launch a global organization to identify and reduce biotechnology-related risks and develop an international approach to prevent the illicit synthesis of dangerous biological agents.

In preparation for the forum, NTI and WEF released a report called Biosecurity Innovation and Risk Reduction: A Global Framework for Accessible, Safe and Secure DNA Synthesis.

The report made two recommendations: The first is the development of a common mechanism for screening DNA orders and the development of a larger system of common global life-science norms overseen by a globally recognized organization to prevent biotechnology disasters. The second is encouraging safe and secure technological development.

Viruses can be created using commercially available technologies, and more advanced DNA synthesis machines are expected to be available in two to three years.

There is no group within the United Nations or World Health Organization dedicated to identifying and providing guidance on emerging biotechnologies.

https://homelandprepnews.com/stories/43410-nuclear-threat-initiative-ceo-urges-reduction-of-biological-threat-risk/

Return to top

US ARMS CONTROL

Arms Control Today (Washington, D.C.)

Opportunities for Nuclear Arms Control Engagement with China

By Tong Zhao

January/February 2020

The clock is ticking on an extension of the 2010 New Strategic Arms Reduction Treaty (New START). To complicate matters, instead of extending the treaty as is, Washington seeks to broaden the existing U.S.-Russian agreement by including China in a new trilateral arms control framework. There is no chance that Beijing would change its long-held views on arms control within the next 12 months before New START expires. Nonetheless, China's growing military power and influence are producing counterpressures for China to deepen its participation in arms control. At a time when President Xi Jinping said China should "take center stage in the world,"1 China may find itself having to seriously prepare for major-power competitions and major-power arms control.

Over time, China's own interest will align with arms control for several reasons. At the strategic level, the major-power competition between Washington and Beijing is going to be a long-term reality. It is driven by fundamental conflicts in world views, values, and ways of governance. Nonetheless, it is in no one's interest, including China's, to allow this competition to become completely uncontrolled and unregulated. Just as U.S. and Soviet leaders Ronald Reagan and Mikhail Gorbachev agreed during the Cold War that "nuclear wars cannot be won and should never be fought," Beijing and Washington should set some basic boundaries to their competition so that they do not half-wittingly destroy everything worth competing for. In particular, they need to assure each other that neither intends to threaten the survival or the most critical security interests of the other. To this end, they must commit to maintain strategic stability, avoid a repetition of a Cold War-style arms race, and agree on redlines and basic rules of major-power competition. Against an uncertain future geopolitical landscape at regional and global levels, arms control can and should serve as guardrails and a stabilizer of the major powers' strategic relationship.

China has benefited from the U.S.-Russian arms control process without having to contribute directly to it. That situation is no longer tenable. Indeed, China's stand-aside policies have already unwittingly contributed to the demise of one U.S.-Russian nuclear treaty, the Intermediate-Range Nuclear Forces (INF) Treaty. In the mid-2000s, Russia openly complained about restrictions on its missile programs while other nations, particularly China, were unconstrained. If China had acknowledged and addressed Russian concerns, Moscow would have had one less reason to develop and deploy the alleged treaty-violating 9M729 missile, which led the United States to withdraw from the pact. With the treaty's demise, China is now presented with a much larger security problem. In this sense, arms control can be a preventive measure that helps China manage and mitigate future security challenges. If China's involvement in some arms control measures today can contribute to the continuation of U.S.-Russian arms control in the future, it would be worth serious Chinese efforts.

Domestically, China is facing a new economic reality. Decades of very fast economic growth have revealed deep structural problems in its economic system. With accumulating governmental debts, looming stagnation, a rapidly aging society, and external troubles in its trade relations, economists worry not only about a growth slowdown but about a possible economic crisis.2 One thing seems clear: China will probably be unable to increase defense spending at its prior rate without undermining its population's key socioeconomic interests. A timely decision to enter arms control

can help avoid a costly reciprocal arms buildup with the United States, including at the regional level over INF Treaty-range missiles and at the global level over other strategic military capabilities that will not improve any party's security. This decision can also contribute to China's foreign image as a responsible power. As the United States suffers huge reputation losses by withdrawing from key arms control institutions, Washington creates opportunities for Beijing to win global support for demonstrating leadership in advocating cooperative arms control as a necessary step toward achieving Xi's vision on "building a community with a shared future for mankind."3

How to Engage With China

The current U.S. approach to include China in arms control will not work. Statements by senior U.S. officials leave China with two main impressions. First, the White House is not really serious about including China in arms control and simply uses it as an excuse to end New START. U.S. officials have not been able to suggest specific and substantive proposals for including China. Second, China believes the United States seeks to impose constraints only on Chinese capabilities and intends to use arms control as a tool to advance its own competitive advantage and win the military competition with China. There is no hint that the Trump administration imagines reciprocity or mutual restraint.

This approach will backfire in Beijing, as it would anywhere else. The United States cannot coerce China to participate in arms control. If Washington wishes to copy the 1980s European dual-track game plan by stepping up pressure on China and deploying new INF Treaty-type missiles in the Asia Pacific, Beijing would be much more likely to respond with more of its own missile deployments than to agree to conduct arms control under U.S. military pressure. Without a reformist leader in China like Gorbachev in the Soviet Union in the late 1980s, who prioritized rapprochement with the West, a coercive U.S. strategy would likely be met with strong pushback. China believes it has acquired technological advantages and better operational experience in areas such as INF Treaty-type missiles. This confidence in China's capacity to outcompete the United States makes security policymakers even less likely to consider arms control proposals that impose more constraints on China than the United States.

The United States needs to make its objective practical. Arms control with China cannot be aimed at helping Washington win future military competition with China. The goal should be to help manage the competition so that it will not be as dangerous and costly as in the Cold War, which is a common interest that China shares. Arms control proposals offered to China need to involve fair give-and-take between all parties. Given China's lack of experience in arms control, it is unrealistic to expect Beijing to introduce detailed options. The United States and Russia should take the responsibility to think creatively and propose concrete ideas. Two proposals may stimulate thought experiments for feasible models of arms control cooperation with China.

Possible Models of Arms Control Cooperation With China

Regarding INF Treaty-range missiles, China has an advantage in land-based systems, and the United States has superior capability in air-based systems. Both countries are procuring more weapons, and the trajectories of their development show that, at some time in the near future, Chinese and U.S. stockpiles of land- and air-based INF Treaty-range missiles will likely be on the same scale, counting nuclear and conventional systems. This may provide an opportunity to set an equal ceiling for the combined stockpile of these missiles in each country. The two countries could then negotiate and cooperate as equals. Each would have flexibility to decide how they would like to mix their land- and air-based systems and thus to balance their traditional advantages and future security needs. They also would have the freedom to decide how quickly and deeply they proceed with arms control. For example, they could set the ceiling somewhat higher than their existing stockpile and make this a capping agreement at the first stage, or they could set the ceiling at the same level of

their existing stockpile and turn it into a freeze agreement. Still more ambitiously, they could set a lower ceiling to gradually roll back their capabilities down the road.

A second model takes longer-range strategic weapons systems into the equation. Given China's numerical advantage in land-based INF Treaty-range missiles and the much larger U.S. and Russian stockpiles of long-range nuclear-capable systems, it would make sense to set an equal ceiling for the combined stockpile of both types of weapons for all three states. This would cover all INF Treaty-range land-based missile launchers, intercontinental ballistic missile launchers, submarine-launched ballistic missile launchers, and heavy bombers. This type of trilateral, comprehensive framework could focus initially on the numbers of launchers before turning to the more complex issues involving missiles and warheads.

Each of the three countries currently operates approximately 600 launchers of the relevant types.4 This offers an opportunity to include China in a trilateral arms control framework on an equal footing without creating the impression of China being treated as a junior partner to two former superpowers. A comprehensive agreement along these lines would address U.S. and Russian concerns about China's INF Treaty-range land-based missiles and helps address the Chinese concern about U.S. and Russian strategic weapons advantages. It meets the expressed goal of the Trump administration by essentially including China in a combination of New START and the INF Treaty, but in a way that is fair and makes sense to China.

Committing to a Long-Term Process

These are just two examples of many potential arms control models that could be discussed with China. They serve the goal of offering China some concrete proposals and ideas that would not be immediately unfair to Beijing, therefore creating the opportunity to start a process of talking and engagement on substantive arms control issues. Given the traditionally high level of skepticism toward arms control in China's security expert community, even in the most optimistic scenarios it will take time before informal talks and explorations on arms control options could develop into official negotiations, and then lead to executive-level agreements and possibly legally binding treaties far down the road. Nonetheless, whether it may generate quick results in the near term, the process of talking and engaging with China on these issues in and of itself is necessary and important. Without it, there is little clear way to build confidence in each nation's will and capability to manage major-power competition.

Indeed, because mutual confidence is in such short supply, a modest yet still worthwhile objective could be to open dialogue with the Chinese security community that gradually addresses its habitual inclination for secrecy and ambiguity and its long-standing skepticism toward arms control as a potentially effective tool to achieve cooperative security. Deeper understanding and greater appreciation of transparency, mutual restraint, and verification can be built by exposing Chinese policymakers and experts to the political practicality and technical feasibility of rival states overcoming hostility and achieving mutual security benefits through arms control, just as the two former superpowers have demonstrated in recent history. In this regard, measures such as sharing with China the U.S. and Russian perspectives and practices of exchanging missile prelaunch notifications and flight-test telemetry data, as well as inviting Chinese observers to U.S.-Russian on-site inspections or Open Skies Treaty flights without demanding a reciprocal Chinese transparency measure, would be helpful.

Washington and Beijing also need to work on removing misunderstandings about their nuclear doctrines and policies. For example, the lack of nuanced understandings about U.S. domestic policy deliberations has led most Chinese experts to believe that the pursuit of new low-yield nuclear weapons by Washington reflects a U.S. effort to deliberately lower the threshold of nuclear employment and to build up nuclear war-fighting capabilities,5 rather than as a response to the

perceived Russian "escalate to deescalate" strategy. Perceiving U.S. policies this way, Chinese distrust of U.S. intentions and the value of arms control cooperation is unsurprising. Substantive and extensive exchanges and dialogue on doctrines and policies can help promote more accurate and nuanced mutual understanding.

Additionally, a comprehensive dialogue on reducing the risk of nuclear use and understanding the impact of new technologies on strategic stability can be started soon. This is low-hanging fruit for engagement with China, which has expressed clear interest in joint examination of some of these issues.6 Missile defense, conventional hypersonic weapons, counterspace technologies, cyberweapons, artificial intelligence, and autonomous weapons systems may affect the credibility of a nuclear deterrent and present an important challenge to major-power strategic-stability relations. The entanglement between nuclear and non-nuclear technologies, as well as other operational practices of existing nuclear powers, may increase the risk of inadvertent escalation of conflicts.7 The major powers have divergent views on the impact of new technologies on nuclear deterrence, and they are far from reaching a common appreciation of the risks of conflict escalation. Dedicated working groups need to be set up for technical and policy experts to study these issues jointly and thoroughly, which can take place at the unclassified level to minimize bureaucratic resistance. As long as the perception gaps on new technologies can be narrowed, even if formal arms control agreements to control and regulate such technologies are impossible initially, countries would still have stronger incentives to minimize nuclear risks through unilateral readjustments of military capabilities and postures.

In sum, arms control engagement with China is not impossible. It is important, however, that the United States, Russia, and other relevant parties approach this issue with China in the correct way. Otherwise, they could destroy the prospect of arms control cooperation with China before it starts, and the existing U.S.-Russian arms control regime might be negatively affected as a result. With the growing need to effectively manage major-power competition, the stakes of getting it right are high. Fair, equal, and concrete proposals are necessary to start a process of arms control talks with China. Commitments to long-term efforts to build capability, address entrenched fears, and cultivate nuanced understandings are also imperative to pave the way for more substantive cooperation down the road.

Endnotes

1. "Xi Jinping: 'Time for China to Take Centre Stage,'" BBC, October 18, 2017, https://www.bbc.com/news/world-asia-china-41647872.

2. Hal Lambert, "Is China About to Cause the Next Asian Economic Crisis?" Real Clear Politics, August 13, 2019, https://www.realclearpolitics.com/articles/2019/08/13/is_china_about_to_cause_the_next_asian_economic_crisis_140996.html.

3. Cao Desheng, "Nation Helping World to Create Shared Future," China Daily, August 20, 2019, https://www.chinadaily.com.cn/a/201908/20/WS5d5b06c2a310cf3e35566a15.html.

4. U.S. Office of the Secretary of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019," May 2, 2019, p. 117, https://media.defense.gov/2019/May/02/2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf; Hans M. Kristensen and Matt Korda, "Chinese Nuclear Forces, 2019," Bulletin of the Atomic Scientists, Vol. 75, No. 4 (2019): 171–178; Hans M. Kristensen and Robert S. Norris, "Russian Nuclear Forces, 2019," Bulletin of the Atomic Scientists, Vol. 75, No. 2 (2019): 73–84; Hans M. Kristensen and Matt Korda, "United States Nuclear Forces, 2019," Bulletin of the Atomic Scientists, Vol. 75, No. 3 (2019): 122–134.

5. Xianrong Li and Yang Min, "U.S. Will Further Enhance Nuclear Warfighting Capability," PLA Daily, March 1, 2018, p. 11.

6. Cong Fu, "Maintain Global Strategic Stability and Reduce Risks of Nuclear Conflicts" (speech, 16th PIIC Arms Control Conference, October 16, 2019.)

7. James M. Acton, "Escalation Through Entanglement: How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War," International Security, Vol. 43, No. 1 (2018): 56–99; James M. Acton et al., "Entanglement: Chinese and Russian Perspectives on Non-Nuclear Weapons and Nuclear Risks," Carnegie Endowment for International Peace, November 2017.

Tong Zhao is a senior fellow at the Carnegie-Tsinghua Center for Global Policy in Beijing.

https://www.armscontrol.org/act/2020-01/features/opportunities-nuclear-arms-control-engagement-china

Return to top

The Hill (Washington, D.C.)

Pentagon Official: 'We Don't Fully Know the Reasons' North Korea Didn't Fire 'Christmas Gift'

By Rebecca Kheel

Jan. 28, 2020

A top Pentagon official said Tuesday it's unclear why North Korea did not take provocation action such as a missile test after warning the United States about a "Christmas gift" last year.

"Predicting North Korea's future behavior is always hazardous," Undersecretary of Defense for policy John Rood told the House Armed Services Committee on Tuesday. "We don't know fully the reasons why the North Koreans did not engage in more provocative behavior, which they seemed to be hinting they were planning to do in December."

Pyongyang kept the world on edge during the holiday season after ominously warning that it was up to the United States what kind of "Christmas gift" it would receive.

U.S. officials said at the time they believed the gift could be a long-range missile test, which North Korea has not conducted since it began nuclear negotiations with President Trump.

North Korea never fired a missile in late December or early January. But leader Kim Jong Un did say on New Year's Day that Pyongyang no longer felt bound by its self-imposed moratorium on long-range missile and nuclear tests, vowing the world would see a new strategic weapon "in the near future."

Still, Kim did not shut the door to further negotiations with the United States.

Trump has touted the moratorium as a sign of success in his negotiations with Kim, though talks have stalled since a February 2019 summit ended without a denuclearization deal.

And though North Korea hasn't fired a long-range missile in more than two years, it conducted more than a dozen short-range missile tests last year.

On Tuesday, Rood said the short-range tests were "clearly a message" from North Korea, "as well as a developmental activity."

Rood added "we could very well see" more missile tests "or other activities" from North Korea, but added that's "very speculative at this stage."

"We're watching very carefully what they're doing," he said. "Our message to them has been that obviously that we would regard those things as provocative activities."

Rood said the U.S. message has also been that getting back to the negotiating table "would be more constructive and productive," but added "certainly we've got to be alert to the possibility that we could see the North conduct those type of tests."

https://thehill.com/policy/defense/480307-pentagon-official-we-dont-fully-know-the-reasons-north-korea-didnt-fire

Return to top

COMMENTARY

Defense One (Washington, D.C.)

Great Powers Must Talk to Each Other about AI

By Elsa B. Kania and Andrew Imbrie

Jan. 28, 2020

Imagine an underwater drone armed with nuclear warheads and capable of operating autonomously. Now imagine that drone has lost its way and wandered into another state's territorial waters.

A recipe for disaster? Perhaps. But science fiction? Sadly, no.

Russia aims to field just such a drone by 2027, CNBC reported last year, citing those familiar with a U.S. intelligence assessment. Known as Poseidon, the drone will be nuclear-armed and nuclear-powered.

While the dynamics of artificial intelligence and machine learning, or ML, research remain open and often collaborative, the military potential of AI has intensified competition among great powers. In particular, Chinese, Russian and American leaders hail AI as a strategic technology critical to future national competitiveness.

The military applications of artificial intelligence have generated exuberant expectations, including predictions that the advent of AI could disrupt the military balance and even change the very nature of warfare.

At times, the enthusiasm of military and political leaders appears to have outpaced their awareness of the potential risks and security concerns that could arise with the deployment of such nascent, relatively unproven technologies. In the quest to achieve comparative advantage, military powers could rush to deploy AI/ML-enabled systems that are unsafe, untested or unreliable.

As American strategy reorients toward strategic competition, critical considerations of surety, security and reliability around AI/ML applications should not be cast aside. Any coherent framework for U.S. strategy must include policies to promote American innovation and competitiveness, while deepening cooperation with allies and partners.

The reality of great power rivalry will entail sharper contestation on issues where U.S. values and interests directly conflict with those of Beijing and Moscow, but it equally requires constructive approaches to pursuing selective and pragmatic engagement on issues of mutual concern.

Even against the backdrop of strategic distrust, there are reasons for major militaries to cooperate on measures to improve the safety, surety, and security of AI systems in military affairs.

Policymakers will need to wrestle with difficult policy trade-offs, balancing potential benefits and possible costs. On the one hand, cross-military collaboration in AI safety and security can reduce the risk of accidents and strategic miscalculations among great powers. On the other hand, such collaboration may improve the reliability of these techniques and capabilities, thereby enabling strategic competitors to deploy AI/ML-enabled military systems more quickly and effectively.

A good place to start may be the development of common definitions and shared understanding of core concepts. American, Chinese, Russian and international policymakers and stakeholders should also pursue steps to improve transparency and promote mutual understanding of the factors influencing the design, development and deployment of AI/ML techniques for military purposes. Over time, these measures could create a foundation for collaborative initiatives to promote AI safety and security.

AI safety is a critical domain of research, a subject of active inquiry and expanding activities within industry and academia worldwide. However, this research is often poorly understood and under-resourced. U.S. policy initiatives to address AI safety and surety remain embryonic. Russia, meanwhile, has been moving ahead in experimenting with and even fielding unmanned, AI-enabled, and potentially autonomous weapons, including on the battlefield in Syria. The Chinese approach to AI safety and security appears to involve not only technical concerns about how to ensure the reliability and "controllability" of AI systems to reduce risk, but also concerns about the impact on social stability, which is distinct from the issues under consideration by democratic governments.

After improving conceptual understanding, policymakers should promote transparency and collaboration in AI safety and security research. Joint projects could review and share best practices based on current research and literature, while supporting research collaboration on select topics, such as standards for verifying and validating systems for autonomous vehicles.

The U.S. government should also promote and facilitate dialogues on concrete problems in AI safety and related security concerns among unofficial, non-governmental representatives (Track 2) and through dialogues that include a mix of official representatives and outside experts (Track 1.5). These dialogues can address such issues as reward hacking, robustness to shifts in context, scalable oversight mechanisms, and procedures for verification and validation.

Policymakers should build on and support efforts to develop best practices, common standards use cases, and shared methodologies of testing, evaluating, verifying and validating AI products and systems, including AI-enabled safety-critical systems. Beyond active initiatives in industry, constructive involvement from governments can address market failures and help bridge gaps between public and private initiatives.

Ultimately, discussion on critical issues of testing, evaluation, verification and validation could extend to security dialogues and future military-to-military engagements.

Militaries tend to evaluate each other's intentions and capabilities in terms of worst-case possibilities. Given this reality, and the likely deficit of trust among great powers, there are reasons to consider integrating AI safety and security concerns into existing U.S.-China and U.S.-Russia strategic dialogues on cyber security, nuclear issues and strategic stability.

Ongoing dialogues, whether bilateral or multilateral, could mitigate risks and misperceptions. At a minimum, these conversations could contribute to a shared understanding of the risks of unintended engagements and escalatory consequences with greater autonomy and employment of AI/ML techniques.

If these early initiatives prove effective, policymakers could explore establishing channels to share AI research whose transfer and diffusion lessen the risks of unintentional use.

In some cases, it may be mutually beneficial to transfer technologies or techniques to prevent accidents — even to rivals or potential adversaries. During the Cold War, the United States developed and offered to share permissive action links as a cryptographic control to guard against unauthorized employment of nuclear weapons.

Today, a comparable undertaking could include efforts to define the types of AI research both countries would be willing to share and promulgate. Experts from the United States, China and Russia could explore improvements in AI safety and surety, such as failsafe mechanisms or supervisory algorithms. Of course, there is a risk that sharing these ideas could be one-sided or subject to exploitation, but initial exchanges on the topic could gauge the viability of this approach.

Pragmatic engagement on these core concerns of AI safety, security and stability must be informed by an understanding of past experiences and potential challenges.

Future progress will require a practical, results-oriented approach that convenes participants with the relevant range of expertise and experience. Dialogues and collaborative engagements need to be carefully structured and regularly evaluated for their results, while seeking to maximize reciprocity and symmetry in exchange.

This process must involve openly articulating urgent concerns and differences of opinion, including on issues of values and human rights. In particular, dialogues on AI ethics, safety and security in China need to address the Chinese government's use of AI for censorship and surveillance, including the use of facial recognition to target Uighurs and increase state coercive capacity amid a brutal crackdown and crimes against humanity in Xinjiang.

In these engagements, participants and policymakers should also mitigate the risks of technology transfer and counterintelligence. For American participants, taking reasonable precautions and exercising awareness are paramount, especially when it comes to personal cybersecurity.

The U.S. government should ensure sufficient coordination across dialogues to enable shared situational awareness and promulgation of lessons learned over time. No single clearinghouse in the Department of State, Department of Defense, or elsewhere in the U.S. government appears to track and monitor these activities. As a consequence, the U.S. government may have limited visibility on what's happening and where Track 2 efforts have a logical linkage to Track 1 initiatives.

Tighter feedback loops between Track 1 and Track 2 dialogues where appropriate would ensure clarity of objectives, information sharing and channels for actionable recommendations. This could include meetings and coordination among governmental and non-governmental stakeholders throughout the process

The stakes are too high to refrain from pursuing challenging conversations on AI safety and security. On such vital issues, pragmatic engagement means pursuing courses of action that can be productive and mutually beneficial, while mitigating the risks. Even, and especially, in the absence of trust, great powers should exercise greater agency in shaping the future of AI and responding to the dilemmas it poses for global security and stability.

Elsa Kania is a Research Fellow with Georgetown's Center for Security and Emerging Technology and an Adjunct Senior Fellow with the Technology and National Security Program at the Center for a New American Security. Her views are her own. FULL BIO

Andrew Imbrie is a Senior Fellow with Georgetown University's Center for Security and Emerging Technology. He served on the policy planning staff at the U.S. Department of State during the Obama administration. FULL BIO

https://www.defenseone.com/ideas/2020/01/great-powers-must-talk-each-other-about-ai/162686/

Return to top

Carnegie Endowment for International Peace (Washington, D.C.)

Russia Is Updating Their Nuclear Weapons: What Does That Mean for the Rest of Us?

By Rose Gottemoeller

Jan. 29, 2020

DO THE U.S. AND RUSSIA HAVE DIFFERENT REASONS FOR MODERNIZING NUCLEAR WEAPONS?

In the big strategic game, the Russians and Americans have the same reason for modernizing their nuclear forces: they want to maintain parity. If the two sides have the same number of nuclear warheads deployed, then they will not be tempted to shoot at each other. They also have a reason to avoid an arms race that would entail constantly seeking more nuclear weapons to try to achieve superiority—however temporary. As expensive as nuclear weapons and their delivery vehicles are, parity has kept the costs down by holding the arms race in check.

In the past few years, Vladimir Putin does seem to be after nuclear weapons for another reason—to show that Russia is still a great power to be reckoned with. He has been trumpeting new and exotic systems that are unique, like the nuclear weapon delivery system known as the Burevestnik nuclear-propelled cruise missile.

These exotic systems have more of a political function than a strategic or security one. Their role is to signal Russia's continuing scientific and military prowess at a time when the country does not otherwise have much on offer. Devilishly expensive and sometimes dangerous to operate, they are unlikely to be deployed in big numbers, as a 2019 fatal testing accident of the Burevestnik shows. If U.S.-Russian arms control remains in place, such systems definitely will not be deployed in big numbers, because they would displace proven and highly reliable intercontinental ballistic missiles in the Russian force structure. These ballistic missiles are the backbone of nuclear deterrence for Russia. The exotics don't add to that deterrent. They have some show-off value, but they will do no more than make the rubble bounce.

WHAT ARE EUROPEAN CONCERNS WITH RUSSIA'S NUCLEAR WEAPON MODERNIZATION?

The Europeans, most prominently the NATO Allies, are very concerned about Russia's nuclear modernization programs. Their concerns revolve more around new nuclear missiles to be deployed on European soil than the intercontinental systems that threaten the United States. Poland and Lithuania, for example, are NATO countries bordering Kaliningrad, a Russian enclave in the heart of NATO territory. Russia has put increasingly capable missiles there, including the Iskander, a highly accurate modern missile that is capable of launching either nuclear or conventional warheads.

Likewise, the Europeans are of one mind about the threat posed by a missile known as the 9M729 (SSC-8 in NATO parlance), which is a intermediate-range ground-launched cruise missile that the

Russians developed and deployed in violation of the Intermediate Range Nuclear Forces (INF) Treaty. The Allies all agree that this missile poses a threat to NATO. Although it has not been deployed forward in Kaliningrad, its range is sufficient to threaten all of NATO Europe when deployed in European Russia. It too is said to support both nuclear and conventional weapons.

Since Russia seized Crimea in 2014, the Russians have begun to build up basing sites for their advanced systems there too, including the Iskanders. If Russia brings nuclear weapons into Crimea, it will spark complex political, legal, and moral problems. The world community has largely held firm in condemning Russia's seizure of Crimea and considers Crimea to be Ukrainian territory. Should Russia bring nuclear weapons to Crimea, it will be violating the Non-Proliferation Treaty (NPT) in a fundamental manner, for Ukraine is a non-nuclear weapon state under the NPT. Russia in this case would be behaving in a manner no better than North Korea.

WHAT IS THE ROLE OF ARMS CONTROL IN MANAGING U.S. AND EUROPEAN RELATIONSHIPS WITH RUSSIA?

The most basic role of arms control regimes is to create mutual predictability, ensuring that no country participating is uncertain about its security both now and into the future. In this way, arms control helps to keep defense spending in check, but it also allows countries to build up mutual confidence and stability, which can translate into broader security and economic ties. This assumes, of course, that the deal is properly implemented by all parties, which is why Ronald Reagan's old adage "trust but verify" is so important. If participants are allowed to cheat on an arms control regime, then it becomes hollowed out, detrimental to the security of all.

The fundamental benefits of arms control, however, can be helpful in times of trouble. I like to think that all the work Russia, the United States, and Europe did together in the 1990s was enabled by the then thirty-year legacy of arms control cooperation. We worked together to protect nuclear weapons and materials from the former Soviet arsenal from being stolen or misused. The same goes for the safety of nuclear power plants. When Ukraine, Russia, the European Union, and the U.S. began to work together in the early 1990s to mitigate the effects of the 1987 Chernobyl disaster, existing relationships in the nuclear realm helped the cleanup project run smoother. Nuclear energy is clearly a different world from the nuclear weapons establishment, but the scientific underpinnings and the scientists and engineers working the issues are the same.

Nowadays, I think that we must contemplate what it will mean if no nuclear arms control regimes remain in force. For the generation that worked these issues in Russia, the U.S., and Europe, enough of a residual relationship exists that experts can grasp at opportunities for cooperation when they present themselves. Some mechanisms such as scientist-to-scientist dialogues are likely to remain, such as the Pugwash and Dartmouth dialogues and the National Academy of Sciences exchanges with the Russian Academy of Sciences. These were the first places where Soviet and Western scientists gathered together to confront the problems of nuclear war and to look together for solutions.

We should be concerned, however, that they may revert to the talk shops of the Cold War, with few opportunities to work together on practical projects. Meanwhile, pragmatic and persistent tools, such as the Nuclear Risk Reduction Centers (NRRCs) that operate in the U.S. Department of State and the Russian Ministry of Defense, may find their missions sharply curtailed as they cease to serve any treaty purpose. The U.S., Russia, and Europe may thus be heading to a time when their means of communications in a nuclear crisis is no better than they had during the Cold War.

Rose Gottemoeller is a nonresident senior fellow in Carnegie's Nuclear Policy Program. She also serves as the Frank E. and Arthur W. Payne Distinguished Lecturer at Stanford University's Freeman Spogli Institute for International Studies and is a research fellow at the Hoover Institution.

https://carnegieendowment.org/2020/01/29/russia-is-updating-their-nuclear-weapons-what-does-that-mean-for-rest-of-us-pub-80895

Return to top

The Hill (Washington, D.C.)

Current Gaps in Homeland Missile Defense Need Urgent Attention

By Ariel Cohen

Jan. 27, 2020

In December 2019, as North Atlantic Treaty Organization (NATO) leaders gathered to commemorate its 70 birthday, they recognized China as the alliance's significant security challenge, superseding violent extremism, transnational crime-terror networks, and even Russia, the global leader in nuclear warhead stockpiles.

The PRC arguably boasts the most potent military in the world after the United States and is tied with France for third in its nuclear weapons stockpiles — reportedly controlling around 300, although this is the official data. Many experts believe that Beijing has many more warheads.

Meanwhile, just a couple months prior to the NATO gathering, North Korea conducted a successful test of its submarine launched Pukguksong-3 ballistic missile, which is designed to be nuclear capable.

And even more recently, the Islamic Republic of Iran fired more than a dozen ballistic missiles at targets in Iraq, including the Ain al-Asad air base housing Iraqi and U.S. troops. The lack of U.S. deaths should not be mistaken for Iran's military inefficacy — on the contrary — the Islamic Revolutionary Guard Corps (IRGC) demonstrated restraint in their strikes avenging the killing of Quds Force leader General Qassem Soleimani for fear of provoking further escalation by the United States. The U.S. military, even with advance warning of the attack, lacked the sufficient anti-missile resources to protect its assets, and we're fortunate no one was killed.

Recent events portend an accelerated global ballistic missile arms race.

The strategic respite we got after the collapse of the Soviet Union is long since over. Russia is leading the way with Avangard hypersonic boost glide vehicles allegedly capable of flying at Mach 27. It also claims to have developed a nuclear powered cruise missile codenamed SSC-X-9 Skyfall. It would therefore behoove the United States to revamp its aging and inadequate ballistic missile defense (BMD) capabilities to meet extant and growing challenges.

Today's American missile defense networks — while undoubtedly the most sophisticated on earth — are still not sufficient to protect the homeland and assets abroad. A myriad of ballistic missile threats are out there today — be they from nuclear peers or rogue states.

In the face of limited resources, the Missile Defense Agency (MDA) has dedicated the past 20 years to developing America's missile defense infrastructure based on the Ground-Based Interceptor (GBI). These land-launched weapons, tipped with an explosive bullet or "kill-vehicle," are designed to track and destroy incoming intermediate and intercontinental ballistic missiles (ICBMs). Currently, the United States has 44 interceptors in our arsenals based in Fort Greely, Alaska, and Vandenberg Air Force Base, Calif., aimed to protect against the threats coming from the west and north.

Surprisingly, there are no GBI assets deployed on the East Coast. This is a gaping hole in the U.S. nuclear security umbrella.

It's true that the United States does possess mobile BMD with the Navy's Aegis ship systems that are designed primarily for "mid-course" or tactical/short range defenses, but these systems are already stretched thin. As of FY2018, there were 38 Navy Aegis ships operating around the world, including to defend Europe from potential ballistic missile attacks from countries such as Iran, and in the Western Pacific to provide regional defense against potential ballistic missile attacks from North Korea. Aegis platforms communicate with so called 'standard-missile' family of weapons, the most advanced of which is the Standard Missile 3 (SM-3) used for mobile BMD.

MDA is asking for $1.8 billion in FY2020 to finance its Aegis ship and Aegis ashore (Romania and Poland) programs and help bring the fleet to 54 vessels by FY2024. While these systems are designed for shorter range threats, they can also be used to take out ICBMs shortly after launch. Bolstering this pillar of America's BMD is critical to the safety of U.S. assets at home and abroad.

The bulk of the U.S homeland's missile defense lies in the Ground-based Midcourse Defense system (GMD) which is a combination of GBI's, bases, and critical sensors. Efforts have been made to augment the GMD, including improvements to the ground-based interceptor's kill vehicle, but so far little progress has been made.

The Obama administration cancelled a program in 2009 which would affix GBI's with "multi-object kill vehicles" or MOKVs, allowing single interceptors to take out multiple incoming ICBMs. The next iteration of the MOKV, dubbed the "Redesigned Kill Vehicle," was cancelled in 2019, and is now due to be replaced by the "Next Generation Interceptor." The NGI represents a leap-frog in technology from the RKV, and is designed to both anticipate and counter the ballistic missiles threats over the next several decades. The NGI will be purpose-built to defeat missile swarm threats, decoys, jamming, and other countermeasures.

While this upgrade to America's GMD is sorely needed, the NGI is not anticipated to be combat ready possibly until after 2030.

As we wait for NGI to become operational — and assuming the system is not cancelled — the United States faces at least one decade of heightened and unacceptable vulnerability. In the interim, the only responsible option for U.S. policy makers is to bolster the tried and true midcourse BMD systems like Aegis and the SM-3.

Nuclear weapons are one of the few true existential threats to the United States — we as a country cannot afford to balk at the cost of this vital defense.

Ariel Cohen, Ph.D., is a Senior Fellow at the Atlantic Council's Eurasia Center and director of the Energy, Growth and Security Program at the International Trade and Investment Center.

https://thehill.com/opinion/national-security/480099-current-gaps-in-homeland-missile-defense-need-urgent-attention

Return to top

ABOUT THE USAF CSDS

The USAF Counterproliferation Center (CPC) was established in 1998 at the direction of the Chief of Staff of the Air Force. Located at Maxwell AFB, this Center capitalizes on the resident expertise of Air University — while extending its reach far beyond — and influences a wide audience of leaders and policy makers. A memorandum of agreement between the Air Staff's Director for Nuclear and Counterproliferation (then AF/XON) and Air War College commandant established the initial personnel and responsibilities of the Center. This included integrating counterproliferation awareness into the curriculum and ongoing research at the Air University; establishing an information repository to promote research on counterproliferation and nonproliferation issues; and directing research on the various topics associated with counterproliferation and nonproliferation.

In 2008, the Secretary of Defense's Task Force on Nuclear Weapons Management recommended "Air Force personnel connected to the nuclear mission be required to take a professional military education (PME) course on national, defense, and Air Force concepts for deterrence and defense." This led to the addition of three teaching positions to the CPC in 2011 to enhance nuclear PME efforts. At the same time, the Air Force Nuclear Weapons Center, in coordination with the AF/A10 and Air Force Global Strike Command, established a series of courses at Kirtland AFB to provide professional continuing education (PCE) through the careers of those Air Force personnel working in or supporting the nuclear enterprise. This mission was transferred to the CPC in 2012, broadening its mandate to providing education and research on not just countering WMD but also nuclear operations issues. In April 2016, the nuclear PCE courses were transferred from the Air War College to the U.S. Air Force Institute for Technology.

In February 2014, the Center's name was changed to the Center for Unconventional Weapons Studies (CUWS) to reflect its broad coverage of unconventional weapons issues, both offensive and defensive, across the six joint operating concepts (deterrence operations, cooperative security, major combat operations, irregular warfare, stability operations, and homeland security). The term "unconventional weapons," currently defined as nuclear, biological, and chemical weapons, also includes the improvised use of chemical, biological, and radiological hazards. In May 2018, the name changed again to the Center for Strategic Deterrence Studies (CSDS) in recognition of senior Air Force interest in focusing on this vital national security topic.

The Center's military insignia displays the symbols of nuclear, biological, and chemical hazards. The arrows above the hazards represent the four aspects of counterproliferation — counterforce, active defense, passive defense, and consequence management. The Latin inscription "Armis Bella Venenis Geri" stands for "weapons of war involving poisons."