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Surprise Attack

ICBMs and the Real Nuclear Threat



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**“The history of failure in war can almost be summed up in two words:
Too late.
Too late in comprehending the deadly purpose of a potential enemy.
Too late in realizing the mortal danger.
Too late in preparedness.”**

General Douglas MacArthur

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KEY JUDGMENTS

--U.S. intercontinental ballistic missiles (ICBMs) are the most important part of the Triad, because of their high-alert and superior responsiveness compared to nuclear bombers and missile submarines, for deterring and defeating nuclear surprise attack.

--A Biden Administration or future Democrat Congress is likely to unilaterally abolish U.S. ICBMs and nuclear bombers and downsize the Triad to a Monad of missile submarines, to the grave detriment of U.S. national security.

--The U.S. Triad of ICBMs, nuclear bombers, and missile submarines is necessary as these provide complementary, mutually reinforcing capabilities for a broad range of possible nuclear scenarios.

--Submarines are not “invulnerable” and cannot replace ICBMs and bombers.

--U.S. ICBMs on high-alert are not a “hair-trigger” for accidental nuclear war, but Russia, China, and North Korea are such a threat because of profound differences in strategic posture and strategic culture.

--Surprise attack is the most likely nuclear scenario because of U.S. vulnerabilities, adversary strategic posture and paranoid strategic culture, and U.S. strategic culture that regards nuclear war, and especially nuclear surprise attack, as “unthinkable.”

--The U.S. should: Harden the Triad and strategic command and control against Super-EMP weapons; resume nuclear testing to develop new generation nuclear weapons; protect ICBM silos, bomber and submarine bases against hypersonic warheads with anti-missile defenses like Iron Dome and/or Phalanx; deploy space-based missile defenses like Brilliant Pebbles to make a new revolution in military affairs favoring strategic defenses, and shift arms racing away from Mutual Assured Destruction (MAD) to Strategic Assured National Existence (SANE).

--Technological trends such as Super-EMP, hypersonics, super-accuracy, and ultra-low-yield, promise adversaries quick, very-low-casualty, environmentally-clean, surgical victory—the “unthinkable” is becoming increasingly “thinkable” and may soon be irresistible.

SURPRISE ATTACK: ICBMs and the Real Nuclear Threat

“Both in politics and war, what matters is speed.”—Julius Caesar

“God fights on the side with the best artillery.”—Napoleon

ICBMs: The Best Artillery

Surprise nuclear attack, a “bolt from the blue” nuclear Pearl Harbor, is what most Americans fear and imagine when they think about nuclear war. Deterring this scenario are 400 U.S. intercontinental ballistic missiles (ICBMs), armed with 400 of the most effective nuclear warheads, ready to launch in minutes responding to a surprise attack—unlike U.S. nuclear bombers or ballistic missile submarines (SSBN).

U.S. bombers are not maintained nuclear-armed or on strip-alert and so would be destroyed in a surprise attack.

Surprise attack would destroy two-thirds of U.S. SSBNs normally in port, while the 4 SSBNs normally on patrol at sea would require hours to respond to an Emergency Action Message (EAM) ordering them to launch missiles. Hours can become forever in a nuclear war that kills the National Command Authority, uses electromagnetic pulse (EMP) to fry communications links for transmitting EAMs, and unleashes decades of enemy planning and secret weapons designed to destroy the small number of U.S. SSBNs hiding at sea.

The comfortable notion that U.S. missile submarines are “invulnerable” almost certainly underestimates the awesome power of nuclear weapons, and other adversary capabilities, to destroy and disrupt at least the EAM communications links that make SSBNs a viable deterrent. Is it really possible for a nation to absorb a nuclear surprise attack, and then respond via SSBNs? The question is yet unanswered.

If surprise attack is the most likely nuclear threat, then the most important part of the U.S. nuclear deterrent, the only part that may matter in a surprise attack scenario, are the ICBMs and their 400 warheads.

Washington’s Nuclear Scenario

However, Washington officialdom in the Defense Department, State Department, and beltway think tanks have overwhelmingly convinced themselves that surprise attack is the least likely nuclear scenario.¹

¹ Even during the most dangerous period of the Cold War, when the USSR most feared and was itself most likely to execute a surprise nuclear attack under their VRYAN (Surprise Nuclear Missile Attack) program, U.S. National Intelligence Estimates consistently underestimated the threat from nuclear surprise attack. The complacent attitude among Washington elites reflected in these now declassified Cold War NIEs is much worse today: Director of Central Intelligence, *Soviet Capabilities for Strategic Nuclear Conflict, 1982-1992*, NIE 11-3/8-82 (CIA: February

Washington's experts believe any nuclear war is so highly unlikely as to be merely theoretical. And they believe, in the unlikely event of a nuclear war, it will most likely occur from a protracted crisis providing days, weeks, or months of strategic warning so U.S. bombers and SSBNs can be fully generated—making largely irrelevant the high-alert, ever-ready, nuclear lightning embodied in ICBMs.

However, the military chief of the U.S. nuclear deterrent, STRATCOM Commander, Admiral Charles Richard, is leading a heroic effort to make Washington think anew and more realistically about nuclear threats. Admiral Richards, October 21, 2020:

--*“The nation has not seriously considered the possibility of engaging in competition through a crisis or possible direct armed conflict with a nuclear capable adversary in more than 25 years.”*

--*“Given Russia and China’s expanding capabilities in increasingly aggressive behavior, and those posed by nuclear North Korea and possibly Iran, we must reinvigorate the national conversation on the importance of strategic deterrence.”*

--*“We can no longer expect our potential adversaries to act within our long-standing, self-imposed constraints based on our rule sets or values, particularly between conventional and nuclear.”*

--***“We have to account for the possibility of conflict leading to conditions that could seemingly very rapidly drive an adversary to consider nuclear use as their least-bad option.”***²

The Real Nuclear Balance

Much complacency about the threat of nuclear surprise attack is based on false assumptions about the size of the U.S. nuclear deterrent, supposedly comprising so many warheads that a disarming first strike is supposedly impossible.

The press, both liberal and conservative press, and many equally uninformed Washington officials, think of the nuclear balance as the “nuclear stockpile” as estimated and reported from U.S. Government data by the anti-nuclear Federation of American Scientists (FAS). According to FAS nuclear stockpile estimates, the U.S. has 5,800 weapons, Russia has 6,370 weapons, and China has 320 weapons.³ However:

15, 1983. Director of Central Intelligence, *The Soviet Challenge to US Security Interests*, NIE 11/4-82 (CIA: August 10, 1982). Yet during the Cold War, unlike the U.S. intelligence community, a minority of independent analysts, relying on Soviet open source military publications, accurately assessed that the most likely nuclear scenario was a Soviet surprise attack. See for example: Mark Miller, *Soviet Strategic Power and Doctrine* (Advanced International Studies Institute: 1982); John Caravelli, “The Role of Surprise and Preemption in Soviet Military Strategy” *International Security Review* (Summer 1981).

² Terri Moon Cronk, “DOD Must Rethink, Prioritize Strategic Deterrence” DOD News (October 21, 2020). Amy McCullough, “Russia, China Push STRATCOM to Reconsider Strategic Deterrence” Air Force Magazine (October 21, 2020).

³ Hans Kristensen and Matt Korda, “Status of World Nuclear Forces” (Federation of American Scientists: September 2020).

--The “nuclear stockpile” includes thousands of U.S. weapons (over 4,300) that are not operational, are warehoused and retired, are awaiting dismantlement, have been cannibalized for spare parts, and would require months or years to be made operational, if possible at all.

--Russia and China’s “nuclear stockpiles” are unknown to the U.S. Government and FAS and independent estimates vary by tenfold. For example, China’s “nuclear stockpile” according to FAS is 320 weapons, according to Russian estimates 1,600-1,800 weapons, and according to an independent U.S. estimate 3,000 weapons.⁴

--How can China have only 320 weapons, when they have deployed 32 DF-41 ICBMs capable of delivering up to 10-12 MIRVed warheads, which would give Beijing 320-384 warheads on the DF-41 ICBM alone?⁵

--China’s “Underground Great Wall” comprising 5,000 kilometers of tunnels belonging to the PRC’s Strategic Rocket Forces could conceal hundreds of mobile ICBMs.⁶

--Perhaps the truest thing ever said by FAS President Hans Kristensen is, “Only the Chinese Government knows how many nuclear weapons China has”—and this is also true of Russia.⁷

A nuclear war will not be deterred or fought by the “nuclear stockpiles.”

A more accurate representation of the nuclear balance is the number of operational warheads that can be delivered by missiles and bombers, limited by the New Strategic Arms Reduction Treaty (START) to 1,550 warheads for the U.S. and Russia. According to New START data as of

⁴ Surprisingly, DOD estimates China has 200 nuclear weapons, making the anti-nuclear FAS estimate (320) look hawkish, see: Office of the Secretary of Defense, *Security Developments Involving the People’s Republic of China* (Annual Report to Congress: September 1, 2020). Dr. Mark Schneider debunks the almost certainly erroneous DOD estimate and exposes DOD’s history of underestimating China in “The Chinese Nuclear Threat” RealClearDefense (October 24, 2020). Schneider includes estimates from Russian Colonel General Viktor Yesin who in 2012 estimated China had enough fissile material for 3,600 nuclear warheads and built 1,600-1,800, and from Russian Major General Vladimir Dvorkin who in 2012 estimated China had 1,600 nuclear weapons. A three year study by former DOD analyst Phillip Karber assesses China could be hiding up to 3,000 nuclear warheads, including mobile missiles, in their Underground Great Wall. See: Phillip Karber, *Strategic Implications of China’s Underground Great Wall* (Georgetown University: 2012). See also: “China May Have 1,600-1,800 Nuclear Munitions—Experts” Interfax (September 28, 2012). Bret Stephens, “How Many Nukes Does China Have?” Wall Street Journal (October 24, 2011). “Hunt for China’s Secret Nukes: Obama Orders the Pentagon to Find Ways to ‘Neutralize’ Store of Up To 3,000 Nuclear Weapons” Daily Mail (January 8, 2013).

⁵ Ibid, Schneider. “DF-41 (Dong Feng-41/CSS-X-20)” MissileThreat CSIS estimates 10 MIRVed warheads. “DF-41” en.wikipedia 10-12 MIRVed warheads. U.S. senior arms negotiator Marshall Billingslea said in October 2020 that Washington is trying to end China’s “great wall of secrecy” about its nuclear weapons. “Billingslea contrasted the more than 100-page document the United States has released on nuclear strategy to the five paragraphs China has publicly released on its nuclear programs and strategy.” While DOD recently estimates China has 200 operational nuclear weapons, Billingslea notes China has “as many as 2,000 intermediate-range ballistic and cruise missiles.” See; John Grady, “U.S. Working to End Chinese Secrecy Around Nuclear Capabilities” USNI (October 15, 2020).

⁶ Karber, *Strategic Implications of China’s Underground Great Wall*, see note 4.

⁷ Hans Kristensen, “No, China Does Not Have 3,000 Nuclear Weapons” (Federation of American Scientists: December 3, 2011). On Russia, Dr. Mark Schneider, former senior Defense Department official, commenting on Russian Defense Minister Shoigu’s recent statement that Russia has constructed 597 ICBM launchers: “It is not possible to have a number anywhere like this high without a covert undeclared ICBM force.” Schneider correspondence (October 15, 2020). “Orenburg Formation of Russian Strategic Missile Forces to Prepare for Deployment of 2 Avanguard Missile Complexes by Yearend—Shoigu” Interfax (October 13, 2020).

September 1, 2020: the U.S. has 1,457 deployed warheads, and Russia declares 1,447 deployed warheads.⁸

However, Russia is notorious for violating arms control treaties and commitments. For example, Moscow is violating the Intermediate-range Nuclear Forces Treaty (deploying prohibited INF missiles), the Presidential Nuclear Initiative (cheating its way to a tenfold advantage over the U.S. in tactical nuclear weapons), and the Comprehensive Test Ban Treaty (developing advanced, new generation nuclear weapons).⁹

Although the State Department contends Russia is complying with New START, independent experts, like Dr. Mark Schneider, a former DOD senior official, make a compelling case that New START verification provisions are grossly inadequate. Russia could be far above New START levels, according to Schneider having perhaps 3,300 deployed warheads. Usually reliable independent Russian analysts, Pavel Felgengauer and Sergei Rogov, estimate Russia could have, operational and stockpiled, 6,000 strategic nuclear warheads and 10,000 tactical nuclear weapons, noting “the number and readiness state” of these weapons “has never been disclosed.”¹⁰

Intelligence, arms control, and academic communities pretend to have omniscience about the numbers of nuclear weapons deployed by adversaries, despite often being wrong, and despite extraordinary efforts by Russia, China, and North Korea to conceal their nuclear forces. Prudent policymakers and military planners should have low-confidence in intelligence community and other estimates of the nuclear balance—and prepare for the worst.

Russia probably greatly outnumbers the U.S., and China probably has at least parity, in the crucial category of ICBM warheads:

--Russia, in addition to having silo-based and mobile ICBMs, has armed its submarines with ICBMs (unlike U.S. SSBNs that carry IRBMs) so they can strike intercontinental targets from their ports, and have dockside C3 so they can launch while berthed.

--Russia, China, and North Korea have mobile ICBMs (the U.S. has no mobile ICBMs) because they are more survivable against a first strike, can better elude surveillance for “bean counting”

⁸ “New START data as of 1 September 2020”

http://russianforces.org/blog/2020/10/new_start_data_as_of_1_september_1.shtml

⁹ Department of State, *2020 Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments* (Bureau of Verification and Compliance: 2020). Dr. Peter Vincent Pry, “How To Lose A War Without Firing A Shot?” *The Hill* (April 27, 2020). Dr. Peter Vincent Pry, “Arms Control Addiction” *Newsmax* (August 25, 2020). Dr. Peter Vincent Pry, “The Case Against Arms Control” *RealClearDefense* (January 12, 2019). For the fullest record of Soviet arms control violations during the Cold War see “GAC Report on Soviet Noncompliance Oct 1984” *insidethecoldwar.org* which is the summary of the still classified President’s General Advisory Committee on Arms Control and Disarmament, *A Quarter Century of Soviet Compliance Practices Under Arms Control Commitments: 1958-1983* (The White House: 1984).

¹⁰ Dr. Mark Schneider, “Does Russia Have 2-to-1 Advantage In Deployed Strategic Nuclear Weapons?” *RealClearDefense* (January 12, 2019). Pavel Felgengauer, “Kremlin Overrides Own Defense and Foreign Policy Establishment on Arms Control” *Eurasia Daily Monitor* (October 22, 2020).

and other intelligence purposes, *and by launching from unexpected locations can better execute a surprise attack.*

--Russia, China, and North Korea favor ICBMs over bombers and submarines because of their high-alert constant combat readiness to respond to, or initiate, surprise attack.

--Russia and China favor MIRVed ICBMs, armed with multiple warheads having yield/accuracy combinations for destroying hard targets like missile silos, so one ICBM can destroy many targets in a surprise attack.

Russia's ICBMs like the SS-18 Mod 5 (10 warheads) and the Sarmat (Satan II, reportedly 10-15 hypersonic warheads) and China's DF-41 mobile ICBM (10-12 warheads) are ideal instruments for surprise attack.¹¹

If Main Street USA is right and the most likely scenario is a "bolt from the blue" surprise attack (a view with which Julius Caesar, Napoleon and other great captains of history would probably agree), then the nuclear balance that matters most, perhaps the only firepower that really matters, are the ICBM warheads.

We do not know how many operational ICBM warheads are deployed by Russia and China, but the balance might well look like this: United States 400, Russia 1,000-3,300, China 400-1,000.¹²

Abolishing U.S. ICBMs

In the 2020 elections, perhaps the most important and least appreciated issue: a Biden Administration will almost certainly abolish unilaterally America's 400 land-based intercontinental ballistic missiles.

ICBMs according to U.S. Strategic Command are "the bedrock of our strategic posture."¹³ The most recent Defense Department Nuclear Posture Review notes: "The ICBM force is highly

¹¹ "Russia's Hypersonic Ballistic Missile And Laser Systems In Final Tests, Putin Says" Moscow Times (April 11, 2019) describes Satan II as carrying "multiple hypersonic warheads" and "up to 15 warheads." Dan Stefano, "Russia Tests New 'Satan 2' ICBM To Replace Original" wtky.com (March 30, 2018) Putin describes Satan 2 as carrying "a bigger number of nuclear warheads" and "more powerful."

¹² 1,000 Russian ICBM warheads assumes they are complying with New START. Hans Kristensen and Robert Norris estimate Russia has 1,040 ICBM warheads in "Russian Nuclear Forces, 2016" Nuclear Notebook (Bulletin of the Atomic Scientists: 2016). Franz-Stefan Gady, "Russian General: Russia Now Fields 400 Intercontinental Ballistic Missiles" The Diplomat (December 16, 2016). 3,300 Russian ICBM warheads (includes SLBMs of intercontinental range) could be deployed now if Russia is cheating on New START, see excellent analysis of Dr. Mark Schneider, "Russian Nuclear Force Expansion and the Failure of Arms Control" RealClearDefense (October 24, 2019). Schneider, "Does Russia Have 2-to-1 Advantage In Deployed Strategic Nuclear Weapons?" in note 10. Correspondence with Dr. Schneider (October 11, 2020). 400-1,000 ICBM warheads for China, the range assumes a small clandestine force or larger clandestine force, both entirely plausible since 32 deployed DF-41 ICBMs alone can carry 320-384 warheads, and each DF-41 ICBM launcher is supposed to have at least one missile re-load (640-768 warheads). Alternatively, only 68 DF-41s would have to be hidden in China's Underground Great Wall, combined with the 32 deployed DF-41s, for 1,000 warheads.

¹³ Lt. General USAF Thomas Bussiere, Deputy Commander U.S. Strategic Command quoted in Adam Lowther (ed.) *Guide to Nuclear Deterrence in the Age of Great-Power Competition* (2020).

survivable against any but a large-scale nuclear attack. To destroy U.S. ICBMs on the ground, an adversary would need to launch a precisely coordinated attack with hundreds of high-yield and accurate warheads. This is an insurmountable challenge for any potential adversary today, with the exception of Russia.”¹⁴

However, the Minuteman III, a half-century old, needs to be replaced by a new ICBM. The Trump Administration is funding development of a new ICBM, currently called the “Ground-Based Strategic Deterrent” (GBSD), to be deployed in a decade.¹⁵

The anti-nuclear Left has persuaded top Democrats that ICBMs are too expensive (according to anti-nuclear activists, all nuclear weapons are too expensive), unnecessary because the possibility of nuclear surprise attack ended with the Cold War, and dangerous to U.S. national security precisely because ICBM high-alert rates are a “hair trigger” for accidental nuclear war.¹⁶

President Clinton’s former Secretary of Defense, William Perry, and many other Democrat defense professionals likely to influence a Biden Administration, vociferously advocate banning ICBMs.¹⁷

Former Secretary of Defense, William Perry—who in 1980 was a senior Defense Department official when a computer error triggered a false warning that 200 Soviet ICBMs were attacking the United States—in 2016 advocated eliminating ICBMs because they are “some of the most dangerous weapons in the world. They could even trigger an accidental nuclear war.”¹⁸

Perry has “argued for getting rid of the ICBM leg of the triad even if Russia maintained its ICBMs.” According to Perry, ICBMs are “uniquely destabilizing, uniquely dangerous.”¹⁹

According to the Union of Concerned Scientists report *Re-Thinking Land-Based Nuclear Missiles*, “General James Cartwright, former Joint Chiefs of Staff vice chair and former US Strategic Command director, also has spoken out on numerous occasions about the need to eliminate ICBMs, noting that doing so would lower the risk of an accidental launch that could lead to a nuclear exchange.”²⁰

¹⁴ Office of the Secretary of Defense, *Nuclear Posture Review* (Department of Defense: February 2018).

¹⁵ Robert Burns, “Estimate of New Nuclear Missiles to Replace Minuteman 3 Arsenal Increases to \$95.8B” Associated Press for Military Times (October 19, 2020).

¹⁶ “U.S. ICBMs are superfluous and increase the risk of mistaken nuclear war...The United States continues to field silo-based nuclear missiles and keeps them on high alert so they can be launched quickly on warning of an incoming attack—creating the risk of a mistaken nuclear war in response to false warning. Yet, the original rationale for intercontinental ballistic missiles (ICBMs)—and for keeping them on alert—no longer applies” See: David Wright, William Hartung, Lisbeth Gronlund, *Re-Thinking Land-Based Nuclear Missiles* (Union of Concerned Scientists: June 22, 2020). William Hartung, “A \$13 Billion Contract for ICBMs: What’s the Rush?” DefenseOne.com (September 13, 2020).

¹⁷ Ibid.

¹⁸ William Perry, “Why It’s Safe To Scrap America’s ICBMs” New York Times (September 30, 2016).

¹⁹ Wright, Hartung, Gronlund, *Re-Thinking Land-Based Nuclear Missiles* note 16.

²⁰ Ibid.

Cartwright: “Today, the greatest danger is not a Russian bolt but a U.S. blunder—that we might accidentally stumble into nuclear war...Certain nuclear weapons, such as the [air-launched] cruise missile and the ICBM, carry higher risks of accidental war that, fortunately, we no longer need to bear. We are safer without these expensive weapons, and it would be foolish to replace them.”²¹

General Lee Butler, former chief of U.S. Strategic Command (1991-1994), would eliminate ICBMs: “I would have removed land-based missiles from our arsenal a long time ago. I’d be happy to put that mission on submarines...with even a small component of Trident submarines—with all those missiles and all those warheads on patrol—it’s hard to imagine we couldn’t get by.”²²

“More recent secretaries of defense—including former Senator Chuck Hagel, who served under President Obama from 2015 to 2017, and General James Mattis, who served under President Trump from 2017 to 2019—questioned the need for ICBMs only to backtrack when they became a member of the president’s cabinet,” according to the UCS report.²³

Almost immediately after the November 2018 elections gave Democrats control of the House, in March 2019 the House Armed Services Committee held hearings to make the case for abolishing U.S. ICBMs and nuclear bombers—two-thirds of the nuclear Triad—and relying only on ballistic missile submarines (SSBNs).²⁴

House hearings also proposed halving U.S. SSBNs from 12 to 6 boats, barely enough to sustain just two SSBNs on patrol at sea.²⁵

These radically irresponsible ideas, that used to be the fantasies of the anti-nuclear Left, including groups like Ploughshares, Union of Concerned Scientists, Federation of American Scientists, and the Arms Control Association, are now mainstream thinking for Democrats.

Some who hope to preserve the nuclear Triad and ICBMs under a Biden Administration take heart from the Democrat House Armed Services Committee agreeing to President Trump’s defense budget that funds the Triad and new GBSD ICBM. However, achieving this so-called “consensus” was very hard fought, costing concessions from the Republican Senate. It signifies less about Democrat reasonableness toward the Triad and ICBMs and more about the political reality that Republicans control the White House and Senate—which may soon change hands.

²¹ Ibid.

²² Ibid.

²³ Ibid.

²⁴ Hearing, “Outside Perspectives on Nuclear Deterrence Policy and Posture” (House Armed Services Committee: March 6, 2019). Bruce Blair, who starred in the hearings, is credited with converting Rep. Adam Smith, Chairman of the House Armed Service Committees, to his extreme views on U.S. unilateral nuclear disarmament see: Jessica Sleight, Zia Minn, Frank Von Hippel, “Blair: Challenging The Accidental Nuclear War Machine” Bulletin of the Atomic Scientists (August 11, 2020).

²⁵ Ibid.

If Democrats capture the White House and/or the Senate, the best indicator of the future of the Triad and ICBMs are the 2019 House Armed Services Committee hearings that would abolish both. The House is the most powerful part of government currently controlled by Democrats and manifests their policy preferences, should they control the whole government. A Biden Administration would draw much of its national security expertise from House Armed Services Committee members and staff who ran the 2019 hearings.

Democrats now subscribe to nuclear deterrence minimalism, which theory assumes that only a small number of SSBNs are needed to deter nuclear war, and that nothing can go wrong with their warheads, missiles, or the “invulnerable” submarines—assumptions which defy all of military history.

Why The Triad Is Necessary

The nuclear Triad was invented by the Great Generation who survived and won World War II where, for the allies at the beginning, confidently propounded pre-war military theories and sophisticated weapons went wrong:

--France’s “impregnable” Maginot Line, a complex chain of fortifications and underground bunkers, including underground railroads for moving troops and supplies, the ultimate in trench warfare, fell to Germany’s blitzkrieg strategy that made trench warfare obsolete.

--Allied infantry and tanks, designed and trained to fight a replay of World War I, were overwhelmed and outclassed by Axis panzer divisions, mobile infantry and artillery, operating in coordination with airpower, that revolutionized warfare, restoring mobility and grand maneuvers to the battlefields of World War II.

--Battleships and the “big gun” theory of naval warfare died at Pearl Harbor, sunk by Japanese aircraft carriers.

--U.S. torpedoes on aircraft, submarines, and destroyers did not work because of inadequate testing, but dive bombers miraculously saved the day at Midway.

As in World War II, a lot can go wrong with the best laid plans and weapons in a nuclear World War III.

The nuclear Triad is designed with multiple redundant delivery and weapon systems just in case things go wrong, to assuredly deter and defeat a nuclear aggressor:

Bombers capable of strategic nuclear missions number 60: 20 B-2s and 40 B-52s. A stealthier nuclear bomber, the B-21 Raider, is under development, deployment planned toward the end of the decade. Bombers can deliver nuclear or conventional weapons, including the widest variety of nuclear warheads, as gravity bombs or cruise missiles. Bombers are the only strategic delivery system that can be recalled. But bombers need to be generated, as they are no longer maintained on strip alert with nuclear weapons, ready to fly on quick notice. Bombers need to be crewed, fueled, and armed by moving weapons from bunkers and uploading. Bombers are the slowest delivery system and might not penetrate air defenses. Nuclear bombers are located on just 3

bases—Minot, Barksdale (B-52s) and Whiteman (B-2s). *All could be destroyed with just a few warheads in a surprise attack.*

ICBMs number 400 Minuteman IIIs, each armed with a single W87 warhead (300-475 kts), the most accurate and most effective warhead in the U.S. nuclear arsenal. ICBMs are the most rapidly retargetable strategic missile and have the most secure-survivable communications. ICBMs can be used singly and selectively for limited nuclear operations or massively for an all-out attack, as circumstances demand. Located in 400 hardened silos spread across several of the least populous states (Colorado, Montana, Nebraska, North Dakota, and Wyoming), destruction of all U.S. ICBMs would require a big, highly coordinated and costly attack. *However, as adversary weapons become more accurate and stealthy, U.S. ICBMs are increasingly vulnerable.*

SSBNs number 14 Ohio-class ballistic missile submarines, of which two are off-line undergoing long-term maintenance. The 14 Ohios will be replaced with 12 new Columbia SSBNs, planned to deploy in the mid-2030s. Each SSBN carries 20 intermediate-range missiles, each missile armed with 3-4 MIRVed W76 warheads (100 kts), for 60-80 nuclear weapons on each boat. Berthed SSBNs are far more vulnerable than ICBMs to surprise attack, as two-thirds of U.S. missile submarines are docked at two ports (Kings Bay, Georgia and Bangor, Washington), where they could be destroyed by nuclear or conventional weapons. These highly tempting targets offer an adversary an extraordinary exchange ratio—two enemy nuclear warheads could destroy 10 U.S. SSBNs, 200 missiles, and 600-800 warheads, in a surprise attack. 4 SSBNs normally on patrol at sea are supposed to be “invulnerable.” *Assumptions about “invulnerability” are often the first fatalities in war.*

Thus, the nuclear Triad offers a mix of redundant, unique, and mutually reinforcing capabilities that reduces risk by spreading risk over many systems, so everything does not depend on one system working perfectly. Moreover, as a matter of deliberate policy to preserve “strategic stability” the Triad is designed and postured as a retaliatory force, not optimized for surprise attack—unlike the nuclear forces of Russia, China, and North Korea.²⁶

ICBMs versus SSBNs

ICBMs are the most important weapon for deterring and defeating nuclear surprise attack in the Triad—faster, more combat-ready, more responsive, and more survivable than strategic bombers and most missile submarines.

²⁶ For example, most U.S. nuclear warheads are on SSBNs and bombers that require generation, fewer than one-third of warheads on ICBMs, and these armed with single warheads, not MIRVed. Nor does the U.S. have any clandestine nuclear missile forces, but is postured for transparency to comply with New START and other arms control commitments. In contrast, Russia and China both favor MIRVed ICBMs, including mobile ICBMs which are not only more survivable from surprise attack, but can facilitate making a surprise attack by launching from unexpected locations. North Korea too heavily favors ICBMs and recently displayed the world’s largest mobile ICBM that may be MIRVed. All three, Russia, China, and North Korea, almost certainly have clandestine ICBMs.

Everyday, anytime, in the few minutes required to receive an Emergency Action Message and turn two keys, U.S. ICBMs can launch 400 of the most powerful, accurate, effective nuclear warheads, delivering them anywhere in 30 minutes or less.

The awesome capabilities of U.S. ICBMs for decades prevented the Cold War from becoming World War III. Today, U.S. ICBMs continue their role as the most immediate and most powerful nuclear deterrent, overshadowing every big military and diplomatic move on the global chessboard by Russia, China, North Korea, and Iran.

Surprise attack is the nightmare scenario—most likely to happen because it maximizes U.S. vulnerabilities—against which 400 ICBMs that can launch-on-warning are sentinels.

Surprise attack would find at sea just 4 U.S. SSBNs. Despite significant improvements in communications with SSBNs and their re-targetability, ICBMs are significantly more responsive. It matters that ICBMs are located in the U.S. heartland while SSBNs on patrol are thousands of kilometers away, underwater, deep in the Atlantic and Pacific. Hours will be required for an SSBN to receive and act on an Emergency Action Message.

SSBNs do not carry unblocking codes aboard to support launching independently, without an Emergency Action Message. So severing EAM communications would neutralize SSBNs, which could be accomplished by EMP attacks against TACAMO aircraft, the Atlantic and Pacific VLF communications stations, and dedicated military communications satellites.

Submarine-launched-ballistic-missile (SLBM) warheads are almost entirely the W76 100 kiloton weapon, as the more powerful and more accurate W88 had problems. The yield/accuracy combination of the W76 is for soft targets like urban-industrial areas, not hard targets like missile silos and underground bunkers.²⁷ Nearly all submarine missiles are MIRVed with 3-4 warheads, unsuited for many limited nuclear operations.

²⁷ Anti-nuclear activists and perpetual critics of U.S. defense programs accuse the U.S. of “undermining strategic stability” by arming the W76 with the MC4700 “super-fuze” (so-called by Kristensen and company) which allegedly increases W76 accuracy so it can destroy some hard targets, see: Hans Kristensen, Matthew McKinzie, Theodore Postol, “How U.S. Nuclear Force Modernization Is Undermining Strategic Stability: The Burst-Height Compensating Super-Fuze” *Bulletin of the Atomic Scientists* (March 1, 2017). A less hysterical interpretation is that the so-called “super-fuze” is an attempt to partially compensate for NNSA’s delayed Life Extension Program for the W88, because of aging and reliability issues. W88 (475 kts) had significantly greater capabilities than W76 to kill hard targets. Neither warhead poses a disarming first-strike threat against Russian deep underground command posts or Russian missile silos like that for the SS-18, hardened to 20,000 PSI, ten times harder than U.S. silos (to protect against surprise attack). Kristensen and colleagues never criticize Russia, China, or North Korea for “destabilizing strategic stability” with their Super-EMP warheads and other advanced nuclear weapons, but prefer to feed Russian paranoia with false allegations about U.S. preparations for a nuclear first strike.

One SSBN, the *Tennessee*, is now armed with one or some missiles carrying the very low-yield (5 kilotons) W76-2, designed as a tactical, battlefield nuclear weapon.²⁸ If used as a tactical nuclear platform, SSBN survivability is at increased risk, as firing exposes the boat's location.

Under surprise attack conditions, 400 U.S. ICBMs would be supplemented by the 4 SSBNs on patrol at sea carrying at most 240-320 warheads (warhead loadings on SLBMs vary with missions), which numbers will fall sharply if single-warhead versions of the tactical SLBM (armed with the W76-2) proliferate. If the future fleet is reduced to 6 SSBNs, so only two can normally be sustained on patrol, then SLBM warheads available after a surprise attack will number at most 120-160.

SSBNs were originally designed never to be used, and continue chiefly as a survivable reserve at sea intended to deter attack on U.S. cities.

The Myth Of Submarine "Invulnerability"

Thanks to U.S. Navy lobbying for submarine programs, and due to psychological need for a security blanket, Washington has seemingly unshakeable faith in the invulnerability of ballistic missile submarines from all present and possible future threats. This unwarranted confidence in submarine invulnerability threatens to replace the nuclear Triad with an SSBN Monad—to the great detriment of the U.S. nuclear deterrent.

Washington elites, encouraged by the U.S. Navy and Department of Defense, have for too long assumed U.S. SSBNs are invulnerable, a dangerous assumption also in the Nuclear Posture Review that unwisely advocates arming some SLBMs with the W76-2 warhead to give a tactical nuclear mission to SSBNs—because of their alleged invulnerability.²⁹ Yet as the late great James Schlesinger (former Secretary of Defense under two presidents, CIA Director, and one of our nation's most profound strategic thinkers) once warned: "As soon as you fire, you expose the boat."³⁰

Even during the Cold War, serious people warned that Moscow, using means much less sophisticated than those available today, could pose significant threats to the survival of U.S. submarines. Forgotten, those Cold War threats—and new threats arriving on the scene—should be considered before abandoning the Triad for an SSBN Monad.

Espionage

Old fashioned spy-craft and new fashioned cyber-espionage could pose a mortal threat to U.S. submarines—as spying did during the Cold War. For example, Cold War Soviet agent John Walker had access to information disclosing positions of U.S. submarines that he provided to the

²⁸ Kyle Mizokami, "A New and Controversial U.S. Nuclear Weapon Goes to Sea" *Popular Mechanics* (January 30, 2020).

²⁹ *Nuclear Posture Review* see note 14.

³⁰ Schlesinger quoted in Lt. Colonel D.M.O. Miller, "The Balance of Strategic Forces" in Ray Bonds (ed.), *The Balance of Military Power* (St. Martin's Press: 1981) p. 23.

USSR. Soviet double-defector KGB officer Vitaly Yurchenko had Walker in mind when, in describing how the KGB scored against the U.S. Navy, he remarked: “We deciphered millions of your messages. If there had been a war, we would have won.”³¹

U.S. Navy Secretary, John Lehman, shared Yurchenko’s opinion of the damage done by the Walker spy ring: “Had we been engaged in any conflict with the Soviets, it could have had the devastating consequences that Ultra had for the Germans.”³² (During World War II, the Ultra project broke Germany’s encrypted communications, enabling the Allies to win the Battle of the Atlantic against German submarines.³³)

Then CIA Director, Admiral William Studeman, said the Walker ring betrayal of U.S. Navy secrets created “powerful war-winning implications for the Soviets” and “jeopardized the backbone of this country’s national defense.”³⁴ Also, former CIA Deputy Director, George Carver, who spent much of his 24-year career working cryptography and communications, believed Moscow could continue exploiting the Walker data “for years and even decades.” Carver:

*“The United States...can never be positive that it has locked all the barn doors...cannot be totally confident about the security of its communications, particularly its military and especially naval communications. And the damage thus was done...could significantly, if not irrevocably, tilt the very strategic balance on which our survival as a nation depends.”*³⁵

Whether and to what extent Russia and China can find U.S. SSBNs is unknown. Maybe they are entirely in the dark. Or, maybe they know the location of every U.S. submarine.

Anti-Submarine Warfare Sensors

During the Cold War and today, Moscow for decades spent vast resources on an enormous array of technologies, including satellites like EORSAT, trying to locate U.S. submarines hiding at sea. Today, Russia and China have hydroacoustic capabilities for locating SSBNs far more technologically sophisticated than those available to the USSR during the Cold War.

Cold War defense analyst, Roger Speed, then a consultant to the U.S. Navy, calculated Soviet ships sweeping the oceans with towed hydrophone arrays could locate U.S. SSBNs for destruction in two days. According to Speed’s book *Strategic Deterrence in the 1980s*:

“The development of a line array of hydrophones that can be towed through the water represents a potential breakthrough in acoustic ASW technology...this new technology could pose a serious

³¹ John Barron, *Breaking the Ring: The Bizarre Case of the Walker Family Spy Ring* (Houghton Mifflin: 1987) pp. 148, 212, 213.

³² Ibid.

³³ Frederick Winterbotham, *The Ultra Secret: The Inside Story of Operation Ultra, Bletchley Park and Enigma* (HarperCollins: 1974).

³⁴ Barron, *Breaking the Ring*, see note 31.

³⁵ Ibid.

threat to SSBNs. If the detection range is...at least 50 nm, the SSBN patrol area can be searched in two days or less."³⁶

A 2017 study by Keith Lieber and Daryl Press notes that during much of the Cold War, the U.S. was able to track and constantly hold at risk Soviet SSBNs:

"The core of U.S. ASW efforts against the Soviet Union lay in a series of breakthroughs in passive sonar and signals processing, as well as doctrine and tactics to exploit those advances...The competition between Soviet SSBNs and the pack of U.S. submarines, aircraft, and surface ships hunting them varied throughout the Cold War. There were periods in which U.S. forces were winning, trailing every Soviet SSBN on patrol, from port to sea and back. In later periods, after discovering their vulnerability, the Russians pulled their forces into protected 'bastions' near Soviet territory to counter U.S. ASW strategy...the former commander of the U.S. Pacific Fleet in the mid-1980s remarked, the United States was able to 'identify by hull number the identity of Soviet subs...and know exactly where they were. In port or at sea, N3 [director for operations] had an SSN [on them]'...the Cold War ASW competition demonstrates that the deployment of ballistic missile submarines neither ended the Cold War nuclear competition nor negated hopes on either side of attaining military superiority...This back-and-forth struggle between hidiers and seekers looks more like a traditional struggle for naval superiority than the common depiction of invulnerable submarines."³⁷

U.S. ASW achievements against Soviet submarines during the Cold War prove that SSBNs are not invulnerable. Lieber and Press warn "...there are good reasons to suspect that the dramatic steps in remote sensing are increasing the transparency of the seas and undermining the ability of submarines to remain concealed":

"Some of the promising new anti-submarine technologies include improved acoustic sensors (including low-frequency active sonars and new networks of seabed passive sonars); non-acoustic techniques (such as laser detection); sophisticated 'big data' analysis (which exploits leaps in processor speed to sift vast quantities of sensor data); and a variety of unmanned and autonomous undersea vehicles (including those designed to find and shadow adversary submarines for weeks or months)."³⁸

Lieber and Press conclude: "...the key point is that even the nuclear delivery system sometimes touted as the most survivable has been vulnerable in the past and appears to be increasingly vulnerable today, as ASW efforts and capabilities rapidly improve."³⁹

³⁶ Roger D. Speed, *Strategic Deterrence in the 1980s* (Stanford University, Hoover Institution: 1979) pp. 58-59.

³⁷ Keith Lieber and Daryl Press, "The New Era of Counterforce" *International Security* (Spring 2017).

³⁸ *Ibid.*

³⁹ *Ibid.*

We should not rule out the possibility Russia and China have achieved a technological breakthrough in locating submarines—which they would keep secret until wartime. If submarines can be found, they can be destroyed.

Anti-Ship Ballistic Missiles (ASBMs)

ASBMs are a new technology that combines ballistic missiles with maneuvering warheads having electro-optical, infrared, or other seekers to precisely target even moving vessels for destruction. China's DF-26 and DF-21 pose long-range threats to U.S. aircraft carriers, outranging carrier aircraft, threatening to upset the balance of power in the Pacific.⁴⁰

Even Iran has developed ASBMs, the medium-range Khalij Fars (Persian Gulf) and short-range Fateh-110, that have been used successfully to target a ship, appearing to demonstrate an accuracy of 8 meters.⁴¹

ASBMs armed with nuclear warheads could destroy submarines, even if the SSBN location is not known precisely, just approximately. The underwater shockwave from a nuclear weapon travels more efficiently through water, to much longer distances than through air, having a very large lethal radius extending many kilometers against an SSBN.⁴²

ICBMs too could be used as ASBMs to destroy submarines with a nuclear barrage of their ocean patrol areas, even with considerable uncertainty about their locations. A 1981 study by the U.S. Office of Technology Assessment suggested the Soviets could conceivably attack submarines with ICBMs.⁴³

President Reagan's White House Science Advisor, George Keyworth, in a 1984 TV interview warned: "A...warhead such as the SS-18 carries ten of when dropped in the water...will destroy any submarine within a distance of about seven miles." According to Keyworth, if the Soviets could roughly locate U.S. submarines "find out approximately where they are, not track them the way we did in the Second World War, but just know approximately if they are in that 100-mile by 100-mile square...then they can be destroyed in a preemptive attack."⁴⁴

My book *Nuclear Wars: Exchanges and Outcomes* (1990) calculated that Moscow, using only their SS-19 ICBMs, could destroy all U.S. SSBNs, if their at-sea locations are very roughly known,

⁴⁰ "Warning to the United States! China Fires DF-26B and DF-21D Anti-Ship Ballistic Missile (ASBM) 'Aircraft Carrier Killer' Into South China Sea" Andrew Erickson (August 26, 2020). Kristen Huang, "Chinese Military Fires 'Aircraft-Carrier Killer' Missile Into South China Sea as 'Warning to the United States'" South China Morning Post (August 26, 2020).

⁴¹ Sebastien Roblin, "Unthinkable: Could An Iranian Missile Sink A U.S. Aircraft Carrier?" National Interest (June 25, 2020).

⁴² Samuel Glasstone and Philip J. Dolan (eds.), *The Effects of Nuclear Weapons* (Department of Defense: 1977) p. 271,

⁴³ Office of Technology Assessment, *MX Missile Basing* (U.S. Government Printing Office: September 1981) p. 179.

⁴⁴ George Keyworth, *Firing Line: The High Frontier Concept*, PBS TV (June 22, 1984) transcript from Columbia, SC: Southern Educational Communications Association, p. 10.

at a time when the U.S. had 36 SSBNs (not as today 14 reducing to 12 SSBNs). My calculations indicated our submarines will be most vulnerable if their locations are disclosed by launching even one missile for a limited nuclear strike—as is now planned for tactical nuclear scenarios employing SLBMs armed with the W76-2.⁴⁵

Poseidon

My report *POSEIDON: Russia's New Doomsday Machine* (2018) warns that this new Russian nuclear autonomous “torpedo” may be a secret weapon to destroy U.S., British and French SSBNs.⁴⁶ Poseidon is a nuclear-powered robot submarine or torpedo, armed with a nuclear warhead described by various Russian sources as ranging from 2-200 megatons, the later by far the most powerful nuclear weapon ever built.⁴⁷ The yield may be mission selectable.

Moscow advertises Poseidon’s mission as a doomsday machine, designed to raise radioactive tsunamis to inundate U.S. coasts, or to destroy U.S. ports, or to trail and destroy U.S. aircraft carrier groups.⁴⁸ None of these missions makes sense for Poseidon, as Russia can already accomplish all of them by other existing means.

The one mission that makes the most sense for Poseidon, not mentioned by Russia, is trailing and destroying at-sea SSBNs. Nuclear-powered, Poseidon could tail SSBNs for months or years, waiting outside ports for their target to resume patrols. Artificially intelligent, Poseidon could be programmed to recognize the acoustic signature of its target submarine and detonate on command. The lethal radius of a 100-megaton warhead against submarines is over 100 kilometers.⁴⁹

Russia plans to deploy 32 Poseidons.⁵⁰ Perhaps not coincidentally, enough to assign two Poseidons to tail each of 12 Columbia SSBNs and 8 Poseidons to target the 8 SSBNs of allies Britain and France.

Electromagnetic Pulse (EMP)

Super-EMP weapons now deployed by Russia, China, and probably North Korea can generate 100 kilovolts/meter or more, far exceeding the U.S. military standard for EMP hardening—50

⁴⁵ Dr. Peter Vincent Pry, *Nuclear Wars: Exchanges and Outcomes* (Crane Russak: 1990) Chapter 5 “Submarine Survival” pp. 122-152.

⁴⁶ Dr. Peter Vincent Pry, *POSEIDON: Russia's New Doomsday Machine* (Task Force on National and Homeland Security: 2018) pp. 17-21.

⁴⁷ Mark Hodge, “Doomsday Machine” *The Sun* (April 21, 2019).

⁴⁸ Pry, *POSEIDON*, pp. 14-15 see note 46. Dave Mosher, “Putin’s Nuclear ‘Doomsday Machine’ Could Trigger 300-foot Nuclear Tsunamis” *Business Insider* (April 24, 2018). Bill Gertz, “Pentagon Confirms Russia Building Underwater Nuclear Drone” *Washington Free Beacon* (January 17, 2018) and “Putin Unveils Nuclear-Powered Cruise Missiles, Drone Submarines for Attacking U.S.” *Washington Free Beacon* (March 2, 2018).

⁴⁹ *Ibid*, Pry, *POSEIDON*, p. 20 see note 46.

⁵⁰ Press and Information Office of the Russian Federation/TASS (January 12, 2019). “The Russian Navy Plans To Place More Than 30 Poseidon Strategic Nuclear-Capable Underwater Drones On Combat Duty” *polskanorge.com* (January 12, 2019). Franz-Stefan Gady, “US Intelligence: Russia’s Nuclear-Capable ‘Poseidon’ Underwater Drone Ready for Service by 2027” *The Diplomat* (March 26, 2019).

kilovolts/meter.⁵¹ Thus, even the best protected U.S. military forces—including the strategic Triad and its C3I—could be paralyzed.

U.S. SSBNs at sea cannot launch without receiving an Emergency Action Message. The EAM includes an unblocking code to arm nuclear warheads. Submarines cannot execute nuclear strikes without the EAM.

A Super-EMP attack could destroy satellites, land-based VLF communications, TACAMO aircraft, and other redundant means to convey EAMs to submarines on patrol, neutralizing them. EMP could also attack submarines at sea directly.⁵²

A high-yield warhead detonated 400 kilometers above the ocean would generate an EMP field 2,300 kilometers in radius, an area nearly as large as North America. E3 EMP would penetrate the ocean depths and possibly couple into submarines, damaging electronics. Submarines would be especially vulnerable when deploying their very long antennae—which they need to do in order to receive EAMs.⁵³

ICBM Vulnerability

U.S. ICBMs have been vulnerable to a Russian first strike since the Cold War—unless they launch-on-warning, which is one reason ICBMs are maintained constantly on high-alert.

ICBM Threats

During the late-1980s, the USSR opened the “window of vulnerability” for U.S. ICBMs by deploying the SS-18 Mod 4 (NATO designation Satan-I). This MIRVed heavy ICBM could deliver 10 warheads having yield/accuracy combinations capable of destroying Minuteman ICBM silos. If two warheads were targeted against each silo, they could achieve 90% probability of destruction—the Soviet goal.⁵⁴

Later, the Soviets deployed the more accurate SS-18 Mod 5 that could carry more warheads and achieve 90% probability of destruction of a U.S. ICBM silo, targeting against each silo a single warhead. The SS-18 Mod 5 is still the mainstay of Russia’s first strike threat today. 50 SS-18 Mod 5s can deliver 500 warheads, enough to destroy all U.S. ICBM silos, bomber bases, SSBN bases, and key command and control centers in a first strike.

⁵¹ EMP Commission, *Chairman’s Report* (July 2017). All the unclassified EMP Commission reports are at www.firstempcommission.org

⁵² EMP Commission, *Nuclear EMP Attack Scenarios and Combined-Arms Cyber Warfare* (July 2017) pp. 49-56.

⁵³ Pry, *POSEIDON*, pp. 21-25 see note 46.

⁵⁴ Pry, *Nuclear Wars: Exchanges and Outcomes*, pp. 104-105 see note 45. Fratricide is much overstated as an impediment to 2-on-1 attacks against missile silos as warhead arrival can be timed precisely, nearly simultaneously, to avoid fratricide. If the first warhead arrives accurately on target, fratricide of the second warhead does not matter. If the first warhead misses target, its detonation will likely be too far away and unlikely located to fratricide the second warhead.

China's DF-41 mobile ICBM also has sufficient accuracy, reportedly a CEP of 100 meters, to destroy U.S. ICBM silos.⁵⁵

Electromagnetic Pulse (EMP)

Super-EMP weapons deployed by Russia, China, and North Korea can destroy even hardened electronics and paralyze U.S. ICBMs, bombers, SSBNs in port, and communications to SSBNs on patrol at sea. Chairman of the EMP Commission, Dr. William Graham, warned about the threat from Super-EMP weapons to ICBMs and strategic communications in testimony to the House Armed Services Committee:

MR. BARTLETT: It is my understanding that, in interviewing some Russian generals, that they told you that the Soviets had developed a "Super-EMP" enhanced weapon that could produce 200 kilovolts per meter at the center?

DR. GRAHAM: Yes...the Russians had developed what they call the "Super-EMP" weapon that could generate fields in the range of 200 kilovolts per meter. And we had seen in other open literature that the Russians appeared to be using that figure as an upper bound for the kind of EMP that could be produced by nuclear weapons...They also told us there were Russian and other technologists, engineers, and scientists, who were working with North Korea and receiving Western wages, they emphasized helping North Korea with the design of its nuclear weapons...

MR. BARTLETT: This is about, what, four times higher than anything we ever built or tested to, in terms of EMP hardening?

DR. GRAHAM: Yes.

MR. BARTLETT: Which means that, even if you were some hundreds of miles away from that, that it would be somewhere in the range of 50 to 100 kilovolts per meter at the margins of our country, for instance?

DR. GRAHAM: Yes. Over much of the margin, yes.

MR. BARTLETT: So, we aren't sure that much of our military would still be operable after that robust laydown. Is that correct?...I also understand that we aren't certain that we could launch, through a series of robust EMP laydowns, that we could launch our intercontinental ballistic missiles.

DR. GRAHAM: We designed both the missiles and their bases and the strategic communications systems during the Cold War to be able to survive and operate through EMP fields on the order

⁵⁵ "DF-41" en.wikipedia. "China's Strategic Deterrents on Display" China Daily (October 2, 2019). CEP or Circular Error Probable is a measure of missile accuracy. 50% of warheads will strike within 1 CEP and 99.8% with 4 CEP, see: Dr. Peter Vincent Pry, *The Strategic Nuclear Balance: And Why It Matters* (Crane Russak: 1990) pp. 145-146.

*of 50 kilovolts per meter, which was our concern at the time, before we realized that weapons could be designed that had larger EMP fields.*⁵⁶

Hopefully, when the new GBSD ICBM is deployed, and new strategic communications now being planned for the nuclear Triad are deployed, they will be hardened to survive Super-EMP and cyber threats.

Hypersonic Warheads

Hypersonic warheads deploying and under development by Russia and China are another new threat to U.S. ICBMs and the Triad.

Hypersonic warheads are designed to skim along the top of the atmosphere, flying 50-100 miles altitude on a flat depressed trajectory, unlike the much higher arcing ballistic trajectory normally used by ICBMs and other ballistic missiles. Hypersonic warheads can travel 5-25 times the speed of sound, and arrive on target much faster than warheads flying a ballistic trajectory, because their flatter depressed trajectory is shorter.⁵⁷

This flat, lower-altitude trajectory enables hypersonic warheads to fly undetected by U.S. Ballistic Missile Early Warning System (BMEWS) radars until they have almost arrived on target. The Under Secretary of Defense for Research and Engineering, Michael Griffin, testified to the Senate: “We do not have defenses against these systems.”⁵⁸

According to the Defense Intelligence Agency: “Developments in hypersonic propulsion will revolutionize warfare by providing the ability to strike targets more quickly, at greater distances, with more firepower.”⁵⁹

Hypersonic warheads are also Maneuverable Reentry Vehicles (MARVs) that can steer an erratic course toward target—making last-minute detection and interception by U.S. National Missile Defenses much harder or impossible:

*“Two broad types of hypersonic weapons are in development. One is like a super-fast cruise missile and powered during its entire flight. The other is a so-called glide vehicle that would be launched atop a ballistic missile and then separate on reentry. But unlike an ICBM reentry vehicle, it would be maneuvered as it descends and able to evade defenses due to its high speeds and unpredictable path. Either system would be highly destructive with or without a warhead due to the kinetic power of something traveling at over five times the speed of sound.”*⁶⁰

⁵⁶ “Threat Posed By Electromagnetic Pulse (EMP) Attack” Hearing before the House Armed Services Committee (January 10, 2008).

⁵⁷ “Hypersonic Weapon Basics” Missile Defense Advocacy Alliance (May 30, 2018). Amanda Macias, “Russia and China are ‘Aggressively Developing’ Hypersonic Weapons—Here’s What They Are and Why the U.S. Can’t Defend Against Them” *cnbc.com* (March 21, 2018).

⁵⁸ David Lague, “China Leads U.S. On Potent Super-Fast Missiles” *Reuters* (April 25, 2019).

⁵⁹ Tim Greeff, “The U.S. Plays A Difficult Game Of Catch Up On Hypersonic Weapons” *The Hill* (April 22, 2019).

⁶⁰ *Ibid.*

Perhaps most importantly, the maneuverability of hypersonic warheads is part of an “accuracy revolution” that makes all nuclear and conventional weapons much deadlier against hard targets, like missile silos, than they were during the Cold War.⁶¹

Hypersonic warheads can achieve pinpoint accuracy, essentially zero CEP, potentially striking target spot-on. Recent testing of a joint U.S. Army-Navy hypersonic warhead, according to U.S. Army Secretary Ryan McCarthy, hit within 6 inches of its target. Secretary McCarthy: “Hypersonic missiles are hitting their targets with a variance of only a mere 6 inches.”⁶²

Zero CEP, or even much “worse” accuracies within 10-30 meters from target, means very low-yield nuclear weapons (1 kiloton or less for near-zero CEP) can be used to destroy U.S. ICBM silos, and kill them “cleanly” with no radioactive fallout and no collateral civilian casualties. Indeed, with near-zero CEP, hypersonic warheads would not need to be nuclear or conventional high-explosive, but could destroy U.S. ICBM silos by kinetic kill.

Russia is already deploying hypersonic Avanguard warheads on its SS-19 ICBMs.⁶³ Russia’s new, soon to be deployed heavy ICBM called Sarmat (NATO designation Satan-II) is advertised as being able to deliver hypersonic or ballistic nuclear warheads, as many as 15 on one missile.⁶⁴

Russia and China are testing missile systems that can deliver hypersonic warheads from aircraft, ships, and submarines. Submarine delivery of hypersonic warheads and/or stealthy cruise missiles that fly under radar threatens to combine near-zero CEP with near-zero warning for U.S. ICBMs.

All of these technological developments threaten the capability of U.S. ICBMs to survive a surprise attack and to perform their missions by launch-on-warning.

The ICBM “Hair-Trigger” And Risk Of Accidental Nuclear War

The best argument made by those who would abolish U.S. ICBMs is that their constant high-alert status, ready to launch in moments, is a “hair-trigger” that could through miscalculation or false warning result in accidental nuclear war. According to former Defense Secretary William Perry: “The highest probability of starting a nuclear war is a mistaken launch caused by a false alarm and a rushed decision to launch nuclear-armed ICBMs...”⁶⁵

However, the same William Perry joined the consensus of the 2009 Congressional Commission on the Strategic Posture of the United States, co-chaired by former defense secretaries Perry and

⁶¹ Lieber and Press, “The New Era of Counterforce” see note 37.

⁶² Jen Judson, “US-developed Hypersonic Missile Hit Within 6 Inches Of Target, Says Army Secretary” Defense News (October 13, 2020).

⁶³ Nebojsa Malic, “Avanguard Changes Everything: What Russia’s Hypersonic Warhead Deployment Means for the Global Arms Race” rt.com (December 27, 2019).

⁶⁴ See note 11.

⁶⁵ Rebecca Heinrichs, “Our ICBMs Are Necessary and No They Are Not on Hair-Trigger Alert” Air Force Magazine (October 3, 2020).

James Schlesinger, finding that fears over U.S. and Russian ICBMs on high-alert starting a nuclear war accidentally are unwarranted: “This is simply an erroneous characterization of the issue. The alert postures of both countries are, in fact, highly stable. They are subject to multiple layers of control, ensuring clear civilian and indeed presidential decision-making.”⁶⁶

Admiral Richard Mies, then chief of U.S. Strategic Command, rejected the characterization of U.S. ICBMs being on “hair-trigger alert” in testimony before the U.S. Senate:

“I would also like to challenge the perception that our forces are on ‘hair-trigger alert’—a characterization routinely used to justify de-alerting proposals. Multiple, stringent procedural and technical safeguards have been in place to guard against accidental or inadvertent launch. Rigorous safeguards exist to ensure the highest levels of nuclear weapon safety, security, reliability, and command and control. Additionally, the policy of the United States is not to rely on ‘launch on warning.’ As I stated earlier, our forces are postured such that while we have the capability to respond promptly to any attack, we will never need to rely upon ‘launch on warning.’ The diversity, flexibility, and survivability of our strategic forces and our command and control networks are designed to ensure we are never faced with a ‘use them or lose them’ dilemma, and we are always capable of an assured response.”⁶⁷

The Hudson Institute’s Rebecca Heinrichs explains well the dominant view among strategic experts why ICBM high-alert status is not a “hair-trigger”:

“The United States fields an extensive array of sensors to provide warning of a massive launch of ICBMs against our missile fields. We have satellites to detect the infra-red plumes, an array of radars to detect inbound missiles, other satellites to detect the movement of mobile ICBMs and other forces, and other intelligence assets.”⁶⁸

The most important safeguard ensuring U.S. ICBM high-alert status is not a “hair-trigger” is Washington’s belief that nuclear war is merely a remote theoretical possibility, that any nuclear conflict will be preceded by a protracted crisis or conflict providing ample strategic warning for the U.S. to generate bombers and SSBNs to a survivable posture, and that nuclear surprise attack is virtually impossible.

Heinrichs explains well the Washington consensus view: “...realistically, should an enemy decide to launch a nuclear attack against the United States, barring an act of insanity, it would occur within a broader context of tensions. So this hypothetical nightmare scenario, where we would have a believable warning of enemy launch that is, in fact, a false alarm, is highly unlikely.”⁶⁹

⁶⁶ Ibid. Congressional Commission on the Strategic Posture of the United States, *America’s Strategic Posture* (United States Institute of Peace: 2009).

⁶⁷ Ibid, Heinrichs.

⁶⁸ Ibid.

⁶⁹ Ibid.

The Congressional Strategic Posture Commission, former Defense Secretary Schlesinger, former USSTRATCOM commander Admiral Mies, Heinrichs and others are right that U.S. ICBMs on high-alert status are not a “hair-trigger” risking accidental nuclear war, so dangerous that U.S. ICBMs should be banned.

The real and greatest danger is that Washington’s psychological posture dismissive of surprise attack, and the U.S. operational and technical strategic posture, both invites and would reward a nuclear surprise attack that could destroy the Triad.

Surprise Attack: The Most Likely Nuclear Scenario

Arithmetic alone makes a compelling case for surprise attack being the most likely scenario because, as shown earlier, it is by far the most effective way of attacking the Triad. All nuclear bombers could be destroyed on their bases, two-thirds of missile submarines destroyed in port, and surprise is the best hope for destroying ICBMs before they launch-on-warning. Once U.S. bombers are generated and dispersed, once SSBNs are generated and all at sea, once ICBMs have strategic warning that they may be attacked—all will be much harder to destroy.

Adversary Nuclear Doctrine and Strategic Posture

Russian nuclear doctrine puts even more emphasis on the importance of striking first, achieving surprise and preemption, than did Soviet doctrine.⁷⁰ Moscow’s strategic posture relying so heavily on ICBMs (even Russian SSBNs are armed with ICBMs that can be launched dockside) appears designed for surprise attack.

China’s “No First Use” pledge, like the Soviet NFU pledge during the Cold War, is almost certainly fictional. China’s strategic posture, bereft of early-warning satellites and radars, logically should push Beijing toward nuclear first use, early in a crisis or conflict. China must “use them or lose them” based on strategic warning. China’s rapidly building inventory of MIRVed mobile ICBMs and SLBMs looks like imitation of Russian preparations for nuclear blackmail and warfighting.⁷¹

North Korea as soon as it developed a small number of ICBMs began a campaign of nuclear blackmail and made numerous unprovoked threats to strike the U.S. and its allies. At a recent parade North Korea displayed a new SLBM and what appears to be the world’s largest mobile ICBM, that could possibly be MIRVed.⁷² At the parade, dictator Kim Jong-Un declared: “We will

⁷⁰ President Vladimir Putin, *On the Fundamentals of the State Policy of the Russian Federation in the Field of Nuclear Doctrine* (The Kremlin, Moscow: June 2020). Dr. Mark Schneider, “Russian Nuclear ‘De-Escalation’ of Future War” Comparative Strategy (March 25, 2019). Dr. Stephen Blank (ed.), *The Russian Military in Contemporary Perspective* (U.S. Army War College: 2019) especially Chapters 9 and 10. Glen Howard and Matthew Czekaj (eds.), *Russia’s Military Strategy and Doctrine* (Jamestown Foundation: 2019) especially Chapters 6 and 7. Dr. Peter Vincent Pry, “The Great Debate Over Russian Nuclear Doctrine” The Hill (September 6, 2020).

⁷¹ Dr. Peter Vincent Pry, *China: EMP Threat* (Task Force on National and Homeland Security: June 10, 2020) pp. 10-12.

⁷² Vann Van Diepen and Michael Elleman, “North Korea Unveils Two New Strategic Missiles in October 10 Parade” 38 North (October 10, 2020).

continue to strengthen war deterrence for self-defense to deter, control and manage all dangerous attempts and threatening acts, including ever-growing nuclear threats, from hostile forces. But should anyone undermine our national security and mobilize military power against us, I will retaliate by using the most powerful offensive force at our disposal and in a preemptive manner.”⁷³

U.S. Warning And Execution Vulnerabilities

The U.S. array of technical and operational safeguards to verify and react appropriately to an incoming nuclear attack minimizes the possibility of accidental nuclear war, but potentially increases vulnerability to surprise attack:

--The U.S. before launching ICBMs, or any nuclear forces, requires “dual phenomenology” to confirm enemy nuclear attack is incoming or underway, such as satellite and radar confirmation or actual nuclear detonations.

--NORAD and SPACECOMMAND must “threat conference” before warning the President that an enemy nuclear attack will be arriving in a few minutes.

--The President must select a nuclear strike option and authorize its execution through an Emergency Action Message.

--EAMs must be communicated to the forces.

--Before launching, ICBMs and SLBMs, which are normally “detargeted” to strike broad ocean areas as a safeguard against accidental execution, must be re-aimed at targets.⁷⁴

Hypersonic warheads, EMP and cyber-attacks could defeat this highly time-compressed chain of early warning and execution until enemy nuclear detonations occur, when it will be too late. He who strikes first in a nuclear war will most likely win—Russia, China, and North Korea know this.

Vulnerability Of U.S. Strategic Culture

The greatest U.S. vulnerabilities to surprise attack are psychological:

--Denial of nuclear surprise attack likelihood, believing nuclear war most likely would occur in the context of severe crisis or conflict providing strategic warning, so the U.S. can generate its forces to a survivable posture.

--A strategic culture so conditioned to fear the “unthinkable” and averse to appearing to be a nuclear “alarmist” that even the defense and intelligence communities will fail to warn.

History suggests the intelligence community will fail to provide strategic warning and be surprised, even amidst a crisis or major war, as in Japan’s surprise attack on Pearl Harbor in 1941, North

⁷³ Guy Taylor and Bill Gertz, “North Korea Missile Able To Target U.S.” Washington Times (October 12, 2020). Bill Gertz, “North Korea Shows Off New ICBM” Washington Times (October 10, 2020).

⁷⁴“U.S. ICBMs and those SLBMs at sea are maintained on continuous alert, but are not targeted at any specific country. The missiles could, however, be returned to their previous targeting status on short notice. The bomber force is no longer maintained on constant ‘strip alert’, although it could be returned to alert status within a few days.” See: Carey Sublette, Nuclear Weapon Archive, nuclearweaponarchive.org/Nwfaq/Nfaq7-2.html.

Korea's surprise invasion of South Korea in 1950, North Vietnam's surprise Tet Offensive in 1968, and the surprise terrorist attacks of 9/11/2001.

The U.S. has never fully generated strategic forces, not even during the 1962 Cuban missile crisis.

Even the anti-nuclear Union of Concerned Scientists admits that, if U.S. ICBMs are de-alerted as they recommend, although they can be re-alerted merely by throwing a switch—concerns over escalating a crisis may prevent ICBM generation:

“The United States should immediately remove its ICBMs from high alert, which can be done quickly by using the existing safety switch in each silo. It should also eliminate from military plans the option of launching on warning of attack, which would preclude the option of re-alerting the missiles. Re-alerting would be particularly risky during a time of crisis.”⁷⁵

While ICBMs are on high-alert and so always generated, generating bombers and SSBNs is highly visible and potentially provocative, which probably explains why the Triad has never fully generated.

Despite the best laid plans of defense and intelligence community professionals to provide strategic warning “indicators” that are supposed to generate U.S. forces to a survivable posture, countervailing views within these communities will counsel against force generation—and often even against strategic warning—fearing these will escalate a crisis.

Failures To Warn And Generate The Triad

Perhaps most importantly, because U.S. strategic culture is conditioned to regard nuclear war as “unthinkable”—and most “unthinkable” a nuclear surprise attack—U.S. intelligence and defense communities will almost certainly not believe even clear indicators of a possible impending surprise attack:

--During the NATO theater nuclear exercise ABLE ARCHER-83, the USSR prepared Soviet nuclear forces to preempt what Moscow mistakenly believed was an impending U.S. nuclear surprise attack. Despite clear indicators, the U.S. intelligence community failed to warn and the Triad did not generate. Subsequently, a great debate raged within the intelligence community over the failure to warn that lasted seven (7) years, but did nothing, could do little, to correct a strategic culture blind to the threat of nuclear surprise attack.⁷⁶

--During the August 1991 failed coup d'etat against Soviet Premier Mikhail Gorbachev, led by the General Staff and KGB chief Vladimir Kryuchkov, who were true believers in the Surprise Nuclear Missile Attack (VRYAN) program, the General Staff put Soviet nuclear forces on Increased

⁷⁵ Wright, Hartung, Gronlund, *Re-Thinking Land-Based Nuclear Missiles* see note 16.

⁷⁶ In 1990, the President's Foreign Intelligence Advisory Board (PFIAB) finally rebuked the intelligence community for failing to warn about the USSR's 1983 near nuclear surprise attack in: PFIAB, *The Soviet "War Scare"* (February 15, 1990) that was declassified in 2015 from SECRET UMBRA GAMMA WINTEL NOFORN NOCONTRACT ORCON.

Combat Readiness to detect and preempt an impending U.S. surprise attack. The U.S. intelligence community failed to warn.⁷⁷ I personally witnessed a senior CIA officer breakdown in tears during the crisis, defending the failure to warn the President and Joint Chiefs as a “higher duty” to avoid U.S. Triad generation that might escalate into nuclear war.

--During the October 1993 failed coup d’etat against Russian President Boris Yeltsin, while fighting raged in the streets of Moscow, the General Staff launched a major nuclear strategic forces “exercise” that included, for the first time, generating all of their dozen Airborne Nuclear Command Posts. Simultaneously, Russia disclosed to the New York Times their secret “Dead Hand” (officially “PERIMETR”) system that would automatically launch Russian ICBMs to defeat a U.S. nuclear surprise attack.⁷⁸ I was at Peterson AFB at the time, briefing a NORAD/SPACECOMMAND audience comprising hundreds of analysts on nuclear scenarios. Some of us thought these alarming developments warranted Triad generation, but most dismissed the generated Russian posture as “nuclear sabre rattling” and mere “bluster.” The U.S. Triad did not generate.

--On January 25, 1995, in response to false warning that a Norwegian meteorological rocket was a U.S. SLBM, the leading edge of a nuclear surprise attack on Russia, for the first time all three Chegets (Russia’s equivalent of the U.S. presidential “football” for authorizing nuclear strikes) activated for President Yeltsin, General Pavel Grachev (Defense Minister), and General Mikhail Kolesnikov (Chief of the General Staff). It was the most dangerous moment in the nuclear missile age, an accidental nuclear war averted only because President Yeltsin refused to “push the button” and waited until the rocket fell harmlessly into the sea. The U.S. intelligence community was unaware of these perilous events until President Yeltsin publicly disclosed them afterwards. Many in the U.S. defense and intelligence communities drew exactly the wrong conclusion, complacently arguing that Russia’s “system worked” for avoiding nuclear war.⁷⁹

--In 2017, North Korea successfully demonstrated ICBMs that could strike the United States, detonated an H-bomb they described as capable of “super-powerful EMP attack” and displayed an H-bomb ICBM warhead, flew missiles over Japan, and made repeated unprovoked threats to strike the U.S. and allies. Reportedly, General James Mattis (then Defense Secretary) “generated” himself for a North Korean nuclear attack by having emergency communications available in his car, in his bedroom, and sleeping dressed to go.⁸⁰ But the press and policymakers were allowed to believe that the North Korean nuclear threats were mere “bluster.” The U.S. Triad never generated.

⁷⁷ Dr. Peter Vincent Pry, *War Scare: Russia and America on the Nuclear Brink* (Praeger: 1999) Part II “August Coup: The Fall of the Soviet Empire, August 19-21, 1991”.

⁷⁸ Ibid, Part IV “The October Coup, September 21-October 4, 1993”.

⁷⁹ Ibid, Part V “Northern Lights: The Norwegian Missile Crisis, January 25, 1995”.

⁸⁰ Bob Woodward, *Rage* (Simon and Schuster: 2020). Jesse Johnson, “U.S. And North Korea Came Much Closer To War Than Previously Thought” Japan Times (September 21, 2020) and American Military News (September 22, 2020). “2017-2018 North Korea Crisis” en.wikipedia.

If Russia or North Korea struck the United States during any of the nuclear close calls described above, or during any of many other incidents, some described in my book *War Scare: Russia and America on the Nuclear Brink*, they would have caught the U.S. Triad ungenerated in a “bolt from the blue” surprise attack. *It matters not that U.S. intelligence and defense communities are aware of rising tensions, nuclear indicators, or even if a conventional world war is raging (as prior to Pearl Harbor)—if despite these warnings, the U.S. nuclear Triad is not generated to a survivable posture, the enemy can successfully execute a nuclear surprise attack that will have the same destructive effect as if a “bolt from the blue.”*

Adversary Strategic Culture

The men and women of the U.S. intelligence and defense communities are human beings, not unthinking and unfeeling machines who can be hard-wired to react to “nuclear indicators” and robotlike unquestioningly follow protocols that might lead to nuclear Armageddon. They are products of a free society and strategic culture conditioned to fear nuclear war as they would the Apocalypse. Even in the intelligence and defense communities, at least as many would lean toward the anti-nuclear views of the Union of Concerned Scientists as others who would imbibe the wisdom of Colin Gray.

Nuclear victory is “unthinkable” to most Americans, but not to Russia, China, and North Korea, whose totalitarian strategic cultures celebrate their nuclear weapons, parade mobile ICBMs, and play with nuclear fire in their diplomacy, brinkmanship, and plans for winning wars.

The late Bruce Blair and Union of Concerned Scientists may well be right that the most likely nuclear scenario is accidental nuclear war. However, the biggest threat of accidental nuclear war comes not from U.S. ICBMs, but from the ICBMs of Russia, China, and North Korea, whose totalitarian regimes have bred strategic cultures of paranoia and nuclear aggression.

Accidental nuclear war, if it happens, will most likely be initiated by Russia, China, or North Korea, and will come as a “bolt from the blue” surprise to the United States.

What Is To Be Done?

Super-EMP Threat

Super-EMP protection for the modernizing Triad should be a top priority. New U.S. ICBMs, bombers, SSBNs, and C3I systems planned to deploy over the coming decades must be EMP hardened to at least 100 kilovolts/meter. Failure to do so will leave the entire Triad vulnerable to paralysis by a few Super-EMP warheads targeted over U.S. ICBM wings, SSBN and bomber bases—the easiest executed surprise attack, potentially even within the capability of North Korea.

The U.S. should develop Super-EMP weapons to reinforce deterrence by posing an equivalent and proportional counter-threat to adversaries.

Resume Nuclear Testing

The U.S. should resume nuclear testing to prove to adversaries and allies that U.S. nuclear weapons still work and our nuclear deterrent is still credible. So-called “science-based stockpile stewardship” that has forgone nuclear testing since 1992, for 28 years, is probably not credible to Russia, China, and North Korea, who have been testing.⁸¹ Nor is “science-based stockpile stewardship” credible to many experts and nuclear weapon scientists, including those who worked in the program, who urge U.S. resumption of nuclear testing.⁸²

Nuclear testing serves not only a scientific purpose, to certify the safety and reliability of U.S. nuclear weapons, but a political purpose—to demonstrate U.S. nuclear resolve and capabilities to friend and foe alike.

The U.S. must also resume nuclear testing to develop new advanced generation nuclear weapons, to remain competitive and deter or defeat the use of such weapons by Russia, China, and North Korea: Super-EMP warheads; “clean” nuclear weapons that make no radioactive fallout; ultra-low-yield tactical nuclear weapons for land, air, and sea combat; and nuclear weapons for specialized effects like neutrons, x-rays, and gamma-rays. The U.S. must at least develop and test such weapons to understand their capabilities.

The U.S. Defense Nuclear Agency should be re-established to drive development and testing of new U.S. nuclear weapons, as the national laboratories and Defense Threat Reduction Agency have not only completely failed in this mission, but have collaborated in the obsolescence of the U.S. nuclear deterrent.

Hypersonic Threat

U.S. ICBM silos, bomber bases, and SSBN ports could be protected with Iron Dome anti-missile defenses and/or Phalanx automated gatling guns to defeat hypersonic warheads and super-stealthy cruise missiles. Hypersonic glide vehicles will greatly slow as they reenter into the lower, denser, atmosphere and should be much easier to shootdown as they near target.

Israel’s Iron Dome, recently purchased by the U.S. Army, can intercept targets to a range of 70 kilometers. Phalanx (range 2-9 kilometers) is designed to protect aircraft carriers from hypersonic

⁸¹ Dr. Mark Schneider, “Yes, the Russians Are Testing Nuclear Weapons and it is Very Important” RealClearDefense (August 14, 2019).

⁸² See for example former Director of the U.S. Defense Nuclear Agency, Vice Admiral Robert Monroe, “Why America Must Resume Nuclear Tests” Washington Times (February 27, 2019), “Resuming U.S. Nuclear Weapons Testing Is Crucial” Washington Times (November 6, 2018) and “It’s Time For America To Resume Nuclear Testing” The Hill (November 15, 2017). Dr. Peter Vincent Pry, “The U.S. Must Resume Nuclear Testing” Newsmax (September 21, 2020). Los Alamos National Lab scientists working in the “science-based stockpile stewardship program” call for nuclear testing in: John Hopkins and David Sharp, “The Scientific Foundation for Assessing the Nuclear Performance of Weapons in the U.S. Stockpile Is Eroding” Issues In Science And Technology (Winter 2019). 24 years ago, Rep. Floyd Spence, then Chairman of the House National Security Committee, warned that no testing would erode the U.S. nuclear deterrent in *The Clinton Administration and Nuclear Stockpile Stewardship: Erosion By Design* (HNSC: October 30, 1996).

anti-ship missiles, and should be able to protect ICBM silos, bomber and SSBN bases even from powered hypersonic warheads that can sustain supersonic speeds at low-altitude. Together Iron Dome and Phalanx should provide a robust, perhaps impenetrable, layered defense.

If the Triad is adequately protected—a surprise attack cannot succeed. Protecting ICBM silos would eliminate the need to launch-on-warning and should greatly ease concerns from ICBM critics about the risk of accidental nuclear war. When enemy hypersonic warheads are being shot-down over ICBM silos, SSBN ports, and bomber bases—even if BMEWS radars and satellites fail completely, the U.S. will know for sure it is under attack. And we will not have to “use them or lose them.”

Modernizing Strategic Command and Control

“We must have the ability to detect, identify, track and integrate our command and control architecture. NC3 architecture is a patchwork of deliberate systems that have been piecemealed over decades. It works quite well, but it needs to be updated.”—STRATCOM Commander, Admiral Charles Richard, October 21, 2020.⁸³

The U.S. must and is in the process of modernizing command and control for U.S. strategic and nuclear forces, including replacing the President’s aged E-4B Nightwatch so-called “Doomsday Plane” and upgrading the venerable E-6B Looking Glass aircraft that transmits Emergency Action Messages from the National Command Authority to U.S. ICBMs, submarines, and bombers.⁸⁴ Controversial proposals are being considered to speed-up the process for warning, threat assessment, and launching U.S. nuclear forces: by enhancing strategic command and control with Artificial Intelligence (AI).⁸⁵

Proponents of AI argue that short-warning threats like hypersonic warheads will defeat U.S. strategic command and control technologies and decision-making, unless accelerated with AI.⁸⁶ The AI proposal has some merit and deserves exploration. But as long as there is a “man in the loop” U.S. strategic cultural skepticism about nuclear surprise attack and paralyzing fear of nuclear war will probably guarantee the U.S. will always be too late, too “slow on the draw” to launch-on-warning.

NOT RECOMMENDED is AI to fully automate U.S. warning, threat assessment, and launching capabilities—as this would virtually guarantee someday an accidental nuclear war.⁸⁷ Washington

⁸³ Cronk, “U.S. Must Rethink, Prioritize Strategic Deterrence” see note 2.

⁸⁴ Rachel Cohen, “STRATCOM Hopes Experiments Will Speed Nuclear Command Upgrades” Air Force Magazine (September 30, 2020). Oriana Pawlyk, “Air Force Delays Moving Forward with E-4B Doomsday Plane Replacement Effort” Military.com (October 5, 2020). Valerie Insinna, “The Air Force Pushes Off The Start Of Its E-4B ‘Doomsday Plane’ Replacement Effort” Defense News (October 7, 2020).

⁸⁵ Adam Lowther and Curtis McGiffin, “America Needs A ‘Dead Hand’” War on the Rocks (August 2019).

⁸⁶ Ibid.

⁸⁷ Edward Geist and Andrew Lohn, *How Might Artificial Intelligence Affect the Risk of Nuclear War?* (RAND: 2018). Mark Fitzpatrick, “Artificial Intelligence and Nuclear Command and Control” Survival (May 21, 2019). James Johnson, “Artificial Intelligence and Future Warfare” Defense and Security Analysis (April 24, 2019).

should not imitate Moscow's dangerous penchant for unmanned automated nuclear "doomsday machines" like Poseidon.⁸⁸

Russia may have inherited from the USSR a fully automated system for warning, threat assessment, and launching ICBMs preemptively. Moscow's paranoia and proclivity for automation may have wired together their "Dead Hand" (PERIMETR) automated launch control system with their Surprise Nuclear Missile Attack (VRYAN) computer, to ensure that Russian ICBMs are "quicker on the draw" than U.S. ICBMs.⁸⁹ If so, as sure as things go wrong, a nuclear "bolt from the blue" on the U.S. is made more likely.

Strategic defenses are the best way of ensuring that the U.S. is not too late and has time to accurately assess, respond appropriately, and defeat incoming nuclear threats.

Brilliant Pebbles

Space-based anti-missile systems would provide the best defense against nuclear surprise attack by ICBMs, SLBMs, and hypersonic warheads, by intercepting these during their boost, mid-course, and terminal phases of trajectory. Ambassador Henry Cooper, former Director of the Strategic Defense Initiative launched by President Ronald Reagan, is urging U.S. Space Force to deploy a modernized version of Brilliant Pebbles, comprising 1,000 small, autonomous space-based interceptors. Brilliant Pebbles could have been deployed by President Clinton, but was canceled, along with the Strategic Defense Initiative, for ideological reasons—to preserve the Anti-Ballistic Missile Treaty (terminated in 2002) and the principle of Mutual Assured Destruction (MAD).⁹⁰

Cooper estimates Brilliant Pebbles could become operational in 5 years for \$20 billion, a tiny fraction of the over \$1 trillion to be invested modernizing the increasingly vulnerable Triad.⁹¹

⁸⁸Pry, *POSEIDON*, see note 46.

⁸⁹Ibid, pp. 26-27. "Russia Has 'Doomsday' Machine U.S. Expert Says" New York Times (October 8, 1993). Henry Holloway, "Russia Upgrading Its Dreaded Doomsday Device 'Dead Hand' Which Fires All Its Nukes At Once" Daily Star (March 28, 2018). On the VRYAN intelligence program see: Christopher Andrew and Oleg Gordievsky, *KGB: The Inside Story of Its Foreign Operations from Lenin to Gorbachev* (Hodder and Staughton: 1990) and VRYAN directives in Andrew and Gordievsky, *Comrade Kryuchkov's Instructions: Top Secret Files on KGB Global Operations 1975-1985* (Stanford University Press: 1993). On the VRYAN computer program see: William T. Lee, "The Nuclear Brink That Was—And the One That Wasn't" Washington Times (February 7, 1995) and Pry, *War Scare*, Chapter 2 "Operation VRYAN" pp. 14-15 see note 77.

⁹⁰ Ambassador Henry Cooper, "Do We Want A Piece-Meal Space Force?" Newsmax (April 17, 2020). General (ret.) James Abrahamson and Ambassador Henry Cooper, "America Must Revive Space-Based Defense Initiatives" Newsmax (August 14, 2017). Donald Baucom, "The Rise and Fall of Brilliant Pebbles" Journal of Social, Political, and Economic Studies (Summer 2004). Dr. Peter Vincent Pry, "Have Russia and China Already ' Militarized' Space?" RealClearDefense (July 18, 2020).

⁹¹ Ambassador Henry Cooper, "Brilliant Pebbles Is Affordable!" HighFrontier.com (January 8, 2019).

SANE

Space-based defenses could work a new Revolution in Military Affairs: making nuclear missiles obsolete; canceling the powerful technological advantages and incentives that presently favor nuclear blackmail and aggression, striking first, and surprise attack; and inaugurating a much safer, more stable era dominated by strategic defenses. The long nuclear nightmare called MAD, based on the lightning sword of mass destruction weapons, could be replaced with the shield of space-based defenses and a new strategic principle—call it Strategic Assured National Existence (SANE).⁹²

SANE would replace the “mutual hostage relationship” of MAD, that threatens destruction of populations, with intercepting the mass destruction weapons that threaten life. SANE and space-based weapons to implement this defensive strategy is consistent with the ethos of democracies and Judeo-Christian “just war” principles, and so should be more popular and politically sustainable than the offensive nuclear capabilities necessary to underwrite MAD.⁹³

Americans would rather be protected than avenged.

Strategic Suicide

The somnambulant U.S. strategic culture will, almost certainly, fail to implement any of the safeguards described above, most of which have been obviously necessary for decades. On nuclear matters, U.S. and Western strategic culture mostly thinks and acts in a state of denial and unreality.

Nuclear weapons of mass destruction are antithetical to the ethos of western democracies.

Democracies derive their legitimacy from the people. The foremost purpose of democratic government “by, for, and of the people” is supposed to be protecting the people, their property and their lives. Nuclear weapons of mass destruction contradict western traditions, Judeo-Christian and secular humanist principles of “just war” theory, proportionality, and humanity.

In contrast, totalitarian states love, celebrate, and parade nuclear missiles as symbols of their omnipotence and their potential “final solution” to the vexing existence of free peoples, like the United States.

Because nuclear weapons are “undemocratic” they are unpopular in the West, even among those in the U.S. defense and scientific communities responsible for maintaining nuclear deterrence by modernizing the Triad. Unpopularity means nuclear weapons and the Triad do not receive the attention and resources necessary for modernization unless political leaders are willing to risk unpopularity.

⁹² Dr. Peter Vincent Pry, “Better SANE Than MAD” Mackenzie Institute (March 28, 2018).

⁹³ Ibid. Dr. Peter Vincent Pry, “Build Star Wars Now—It’s The Law” Newsmax (February 4, 2019).

Consequently, U.S. and Western strategic culture on matters nuclear speaks “sotto voce.” Few nuclear experts dare speak in “alarmist” terms and hope the facts will “speak for themselves” to policymakers. Experts are often anesthetized to reality by their own carefully nuanced language, a “bureaucratese” that rounds sharp edges off the facts lest these irritate the mostly anti-nuclear media and political establishments.

For example, a recent report *Fit For Purpose?: The U.S. Strategic Posture in 2030 and Beyond* by Lawrence Livermore National Laboratory, where the H-bomb was invented, is excellent if one is schooled in “reading between the lines”—an artifice for speaking uncomfortable truths to peers, while speaking comfort to Presidents and the people. The report, while describing much that is worrisome, concludes in gigantic letters their “politically correct” bottom-line for 2030:

“Despite a great deal of fluidity and uncertainty, it seems unlikely that the net balance of strategic power and influence will have shifted dramatically in favor of any of the three [U.S., Russia, China] by 2030. Each will be able to look back on a record of progress in maintaining a credible threat of nuclear retaliation. None should be able to conclude that it is in a position to seize and hold some gain bearing on a vital interest of another.”⁹⁴

Yet today, in 2020, emboldened by their nuclear capabilities: Russia, having annexed Crimea, wages a clandestine war against Ukraine, challenges U.S. military dominance in the Middle East, and is luring Turkey away from NATO; China has annexed the South China Sea and threatens to invade Taiwan; and North Korea continues building nuclear missiles that can strike the United States and erode the credibility of U.S. security guarantees to Pacific allies.

I hope the future strategic and nuclear balance in 2030 is safer and more stable than seems likely from the perspective of 2020. However, hope is not a strategy, and such hopes seem unfounded given current trends and realities such as these:

--Nuclear deterrence fundamentals are that the U.S. cannot afford to allow any adversary to achieve any real or perceived numerical, technological, or operational advantages that could decisively tilt the strategic balance. These lessons learned by the Great Generation and their successors, who invented nuclear weapons, the Triad, and won the Cold War, with the passing of these strategists and scientists, the hard-learned lessons that achieved Cold War victory are increasingly forgotten.

--The U.S. Triad comprises bombers, ICBMs, SLBMs and SSBNs that are decades old, requiring decades to modernize, while Russia, China, and North Korea have mostly new systems. Russia and China have or are developing some new delivery vehicles that have no counterparts in the U.S. deterrent, including ASBMs, nuclear-powered cruise missiles, autonomous submarines like Russia’s Poseidon, and hypersonic strategic warheads.

--The U.S. has not tested a nuclear weapon in a quarter-century, has been patching-up old weapons built decades ago that are now long past their original service lives, weapons designed for blast

⁹⁴ Brad Roberts (ed.), *Fit For Purpose?: The U.S. Strategic Posture in 2030 and Beyond* (Center for Global Security, Lawrence Livermore National Laboratory: October 2020) p. 121.

and shock and the antiquated strategic contingencies of the Cold War. Scientists who run the so-called “science-based stockpile stewardship program” warn that, without testing, the safety and reliability of U.S. nuclear weapons are increasingly doubtful.⁹⁵

--Russia, China, and North Korea, despite the Comprehensive Test Ban Treaty, have conducted nuclear tests and developed advanced new generation nuclear weapons that have no counterparts in the U.S. deterrent. New Russian nuclear weapons range from a 100-megaton doomsday bomb to ultra-low-yield “clean” tactical nuclear weapons for land, sea, and air combat. Even North Korea probably has Super-EMP weapons.

--The U.S. does not even plan or exercise integrated conventional and nuclear operations, having an unrealistic “firewall” between conventional forces and nuclear forces, as if they would not operate together. As noted in a 2020 report: “Since the end of the Cold War, the integration of nuclear weapons into conventional war planning has faded as nuclear warfighting has been largely siloed off to USSTRATCOM and separated from the rest of the U.S. military.”⁹⁶ U.S. conventional forces commanders and military planners, comprising most of the U.S. armed services, are not well-educated on nuclear effects or prepared to conduct joint conventional/nuclear operations. In contrast, Russia, China, and North Korea routinely conduct exercises integrating conventional and nuclear forces.

--U.S. and allied top political and military leaders never conduct military exercises together involving nuclear forces. Yet how allied governments would react to various nuclear scenarios is crucial to U.S. nuclear operations. For example, whether allies would support strategic or tactical nuclear escalation, including U.S. use of tactical nuclear weapons stored on allied territory, requiring for employment permission of allied political leaders. Before a nuclear World War III happens, it might be nice to know how Germany’s Angela Merkle, France’s Emmanuel Macron, Italy’s Sergio Mattarella, Belgium’s Charles Michel and NATO’s 23 other members might react in various nuclear scenarios. In contrast, the dictators of Russia, China, and North Korea routinely lead nuclear exercises.

Will the envisioned modernizing U.S. Triad of ICBMs, SSBNs, and bombers, inherited from the Cold War, even be relevant in a world where Super-EMP, cyber, hypersonics, super-accuracy, and ultra-low-yield, promise quick, very-low-casualty, environmentally-clean, surgical victory? Technological trends increasingly favor offensive operations and surprise attack.

In 1975, the Department of Defense estimated a mostly successful nuclear surprise attack against the Triad could be executed while limiting collateral U.S. civilian casualties to about 2 million. In 2030, it may well be possible for a nuclear surprise attack against the Triad to be entirely successful, while limiting all U.S. casualties to a few thousand, or even many fewer.

The “unthinkable” is becoming increasingly “thinkable” and someday soon may become irresistible.

⁹⁵ Hopkins and Sharp, “The Scientific Foundation for Assessing the Nuclear Performance of Weapons in the U.S. Stockpile Is Eroding” see note 82.

⁹⁶ Adam Saxton and Mark Cancian, *The Conventional Force Perspective: Nuclear Integration in Doctrine, Concepts, and Exercises* (CSIS: October 8, 2020) p. 2.

Yet space-based strategic defenses can turn the technological tide, if the U.S. awakens and acts—before it is too late.

THE COUNTERFORCE REVOLUTION

In 1974, Defense Secretary Schlesinger testified to Congress that Moscow then had a range of limited nuclear Counterforce options that it could threaten or execute against the United States. Any and all of these Counterforce options, according to Defense Secretary Schlesinger, were more credible and more likely than an all-out nuclear attack on the United States, that would guarantee a U.S. all-out nuclear response. Limiting collateral damage to the U.S. population made these Counterforce nuclear attacks credible. The more limited the collateral damage to U.S. population, and the more effective the Counterforce attack, the less risky and more credible the attack option.

By 2030 or very possibly sooner, the technological revolution in hypersonic warheads, super-accurate near-zero CEP, and “clean” ultra-low-yield nuclear weapons, will make possible a “Counterforce Revolution” where adversaries can make a disarming nuclear first strike against the U.S. Triad while inflicting extremely low casualties, thus greatly increasing the credibility of the threat. Indeed, accuracy is becoming so great that non-nuclear weapons may be used to achieve kinetic kill and cause virtually no casualties, compared to nuclear war as conceived in 1974.

1974 COUNTERFORCE ATTACKS⁹⁷

TARGETS	FATALITIES
2 SSBN Bases	100,000
45 Bomber Bases	300,000
1,000 ICBM Silos	800,000
TOTAL	1,200,000

2030 COUNTERFORCE ATTACKS

TARGETS	CASUALTIES (1 KT Nuclear)	CASUALTIES (Kinetic)
2 SSBN Bases	2,000	200
3 Bomber Bases	3,000	300
400 ICBM silos	1,000	100
TOTAL	5,000	600

⁹⁷Data from Secretary of Defense James Schlesinger, *Briefing on Counterforce Attacks*, Hearing before the Senate Foreign Relations Committee (September 11, 1974) declassified January 10, 1975.