

The U.S. Nuclear Deterrent and the Russian and Chinese Nuclear Threat

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THE U.S. NUCLEAR DETERRENT AND THE RUSSIAN AND CHINESE NUCLEAR THREAT

BY DR. MARK B. SCHNEIDER



After two decades of neglect, the U.S. nuclear deterrent has become seriously eroded. America's nuclear forces are very old and will get significantly older before they are replaced.

Our nuclear weapons production complex is broken. Under the legacy Obama nuclear program, the nuclear TRIAD — a three-sided military-force structure consisting of land-launched nuclear missiles, nuclear missile-armed submarines, and strategic aircraft with nuclear bombs and missiles — will be retained but will decline in effectiveness for the next 10-14 years due to aging, and efforts by nuclear adversaries — Russia, China, North Korea and Iran — to conduct nuclear modernization, force expansion and the deployment of advanced missile and air defenses. The technology of U.S. nuclear deterrent systems is decades behind the state-of-the-art. Arms control reductions, combined with Russian violations are making the situation worse. As former Under Secretary of State Ambassador Robert Joseph has observed, U.S. nuclear forces have become “Second to One.”¹ It is not impossible that the U.S. will end up second to two.

Russian and Chinese nuclear capabilities, now much greater than was assumed in the Obama administration's 2010 Nuclear Posture Review (NPR), are a key element in determining the required size of our nuclear force. Both Russia and China see the U.S.

as their main adversary and are remaking the political map of their regions using hard and soft power. They are both modernizing and expanding their nuclear TRIADs with multiple new systems for each of its legs, while we have only the minimum program to preserve ours. Preserving our TRIAD is vital, but this is not necessarily sufficient in light of emerging threats.

Russia and China are now deploying new nuclear ICBMs, new nuclear air-launched cruise missiles, new nuclear submarine-launched ballistic missiles (SLBMs) and new ballistic missile submarines. Both are developing still newer nuclear ICBMs, SLBMs, ballistic missile submarines, and bombers, including stealth bombers. Russia and China are developing and deploying new and improved nuclear weapons, apparently with the assistance of very low-yield nuclear testing.²

Both Russia and China are putting heavy emphasis on active and passive defenses, including missile defenses. Neither has interest in post-New START nuclear arms control reductions. Both are also modernizing their non-strategic nuclear forces.

A GROWING AND MORE SOPHISTICATED RUSSIAN NUCLEAR ARSENAL

The Russian nuclear threat is made more dangerous by the annexation of Crimea, Russia's overt aggression against Ukraine and its threats against NATO nations. Putin has boasted he could take five NATO capitals in two days.³ Russian leaders also have made nuclear attack threats, including threats in support of their current aggression.⁴ Provocative flights of their nuclear capable bombers are common.⁵ According to the 2016 NATO annual report, Russian military

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exercises have involved 100,000 troops and featured simulated nuclear weapons use against NATO states and Sweden.⁶

Chairman of the Joint Chiefs of Staff General Joseph Dunford stated at a Senate hearing in June 2017, “Russia is also modernizing all elements of its nuclear triad and its non-strategic nuclear weapons.”⁷ As noted in the National Institute for Public Policy’s (NIPP) 2017 report, “A New Nuclear Review for a New Age”

“Russia has announced over 20 programs to develop and deploy new strategic nuclear systems or modernize legacy Soviet systems. These include multiple systems for every leg of the Russian triad, and two possible systems that are beyond the traditional triad, i.e., a hypersonic glide vehicle and a new nuclear-armed and powered undersea delivery vehicle (Status-6). According to Russian open sources,

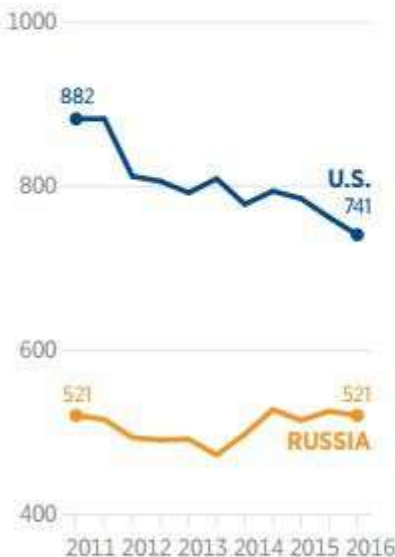
Russia’s modern nuclear programs include a new heavy ICBM with the capacity to carry ‘no fewer than 15’ nuclear warheads, or, alternatively, multiple hypersonic glide vehicles, new road-mobile ICBMs, a rail mobile ICBM, new SSBNs and SLBMs, new and modernized strategic bombers, and nuclear capable cruise missiles.”⁸

Just after publication of the NIPP report, Russian Defense Minister General of the Army Sergei Shoigu said that Russia would expand its ICBM force from 9 to 20 regiments (with 9-10 launchers each) of new MIRVed mobile Yars ICBMs and that 17 of them will be operational by 2021.⁹ MIRVed ICBMs are replacing single warhead ICBMs, resulting in increased warhead numbers as well as better performance characteristics. Shoigu also announced that Russia would increase its modern ballistic missile submarines from 9 to 13 by 2021.¹⁰ These missiles will be heavily MIRVed.

New START Treaty Shrinks U.S. Arsenal, Permits Russian Growth

BALLISTIC MISSILES

Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers



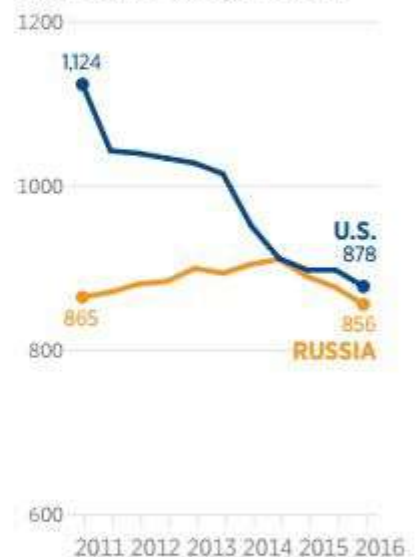
WARHEADS

Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers



LAUNCHERS

Deployed and Non-deployed Launchers of ICBMs, Deployed and Non-deployed Launchers of SLBMs, and Deployed and Non-deployed Heavy Bombers



NOTE: Biannual figures for each year are for March and September, except for 2011 in which the first figure is for February.

SOURCE: U.S. Department of State, Bureau of Verification, Compliance, and Implementation, “New START: Fact Sheets,” <http://www.state.gov/t/avc/newstart/c39906.htm> (accessed May 23, 2016).

In addition, General Shoigu noted, “Advanced strategic missile systems being developed now will start arriving for the troops.” This is reportedly a reference to “the completion of three intercontinental ballistic missile development programs: the RS-26 Rubezh (a development of the Yars-M), [the] RS-28 Sarmat and the rail-based Bagruzin by 2020.”¹¹ In the next stage of Russia’s defense modernization, nuclear weapons are Russia’s “absolute priority.”¹²

Irrespective of whether Russia plans to comply with the New START Treaty when its legal limits go into effect in February 2018, Russia will have many more deployed strategic nuclear warheads than the notional New START limit of 1,550. Indeed, in 2016, the Federation of American Scientists’ Hans Kristensen and Robert Norris — who hardly can be accused of exaggerating Russian capabilities — now credit Russia with 2,600 actual deployed strategic nuclear warheads (mainly due to undercounting of bomber weapons under New START under which one bomber is counted as one warhead irrespective to the number it carries) compared to 1,590 for the U.S.¹³ With or without New START, the number of deployed Russian strategic nuclear warheads is likely to increase. In addition, Russia has thousands of tactical nuclear weapons, ten times as many as the U.S.¹⁴ The Heritage Foundation chart on page 2 illustrates how the New START Treaty shrinks the U.S. nuclear arsenal but permits growth of the Russian arsenal.

The diversity in Russia’s nuclear capabilities vastly exceeds America’s which is now limited to gravity bombs.¹⁵ Dual capability is the norm for Russia. According to General Paul Selva, Vice Chairman of the Joint Chiefs of Staff, Russia is “developing new nonstrategic nuclear weapons...”¹⁶ Russia is also modernizing its delivery systems; some of which are in violation of the Intermediate-Range Nuclear Forces (INF) Treaty. The NIPP report notes, “...senior Russian officials have stated that Russia is developing new types of nuclear weapons.”¹⁷ In 2009, the U.S. Strategic Commission pointed out that Russia apparently conducts low-yield nuclear tests despite its supposed testing moratorium.¹⁸ Russia’s new nuclear weapons reportedly include ultra-high yield to ultra-low yield and low-collateral damage designs.¹⁹

These trends are dangerous in light of Russia’s aggression in Europe and nuclear threats against NATO states and even neutral states. Russian military doctrine allows for the first use of nuclear weapons in conventional war. The NIPP report observes, “Open-source reports and testimony by U.S. and NATO officials indicate that Russia has developed an ‘escalate-to-deescalate,’ or more accurately ‘escalate to win’ nuclear strategy that includes the possibility of nuclear first use in regional and local conflicts in order to terminate a conflict on terms favorable to Russia.”²⁰ Senior Obama administration officials called this “playing with fire.”²¹ While this was clearly a significant change in threat perception, there was no change in U.S. nuclear weapons policy to deal with it. As General Paul Selva has pointed out, our high-yield weapons are not a credible response to low-yield attack.²²

CHINA’S EXPANDING NUCLEAR ARSENAL

The Chinese nuclear threat to the U.S. and our allies is also expanding. China practices extreme secrecy regarding its nuclear forces, but what is known is troubling. Chinese nuclear expansion must be viewed against the backdrop of Chinese territorial expansion in the South China Sea and the overall growth of Chinese military capability. The Chinese government promotes strong nationalism and communist ideology is still prevalent in China’s People’s Liberation Army (PLA).

The NIPP report points out, “The Obama Administration estimated that China has several hundred nuclear weapons, but other estimates place the number much higher.”²³ The high estimates go up to several thousand.²⁴ Irrespective of what the current number is, there are indications of a major force expansion. The NIPP report notes, “The extensive length of China’s ‘Underground Great Wall’ (the Chinese say 5,000-km of deep tunnels), suggests that a larger force of nuclear-armed ICBMs may be planned.”²⁵ These tunnels protect mobile nuclear ICBMs. The implication of this for U.S. nuclear weapons requirements has been largely ignored. While the Obama administration stated we needed “significant” counterforce capability,²⁶ its subsequent programmatic decisions went in the opposite direction.



A Chinese DF-21 medium-range ballistic missile on display at the Beijing Military Museum, 2007.
(Photo by Max Smith, public domain)

China is now deploying the new nuclear DF-31 and the DF-31A mobile ICBMs, a MIRVed version of their DF-5 silo-based ICBM, the type 094 missile submarines carrying JL-2 SLBMs and H-6J cruise missile carrying bombers.²⁷

Recently, China's new DF-31AC, a road-mobile, solid-fuel ICBM which reportedly is MIRVed, was displayed in a Chinese military parade.²⁸ Chinese state media also recently indicated that the large mobile heavily MIRVed DF-41 mobile ICBM is operational.²⁹ China has said it is developing a new bomber, reportedly using a stealth design.³⁰

The 2017 edition of the Pentagon's annual China report confirms it is deploying the new nuclear capable DF-26 IRBM which "is capable of conducting conventional and nuclear precision strikes against ground targets and conventional strikes against naval targets in the western Pacific Ocean."³¹ The U.S. does not have this capability. The report says that in the early 2020s China will likely begin the construction of new Type 096 submarines which reportedly will carry

the new JL-3 SLBM.³² There are reports that the JL-3 will be MIRVed.³³ China is now deploying "two, new air-launched ballistic missiles, one of which may include a nuclear payload."³⁴

To modernize its forces, China continued high-yield nuclear testing through 1996. There are reports of subsequent low-yield testing.³⁵ Chinese officials have said China has developed new nuclear weapons and declassified U.S. intelligence reports say the high-yield tests were related to developing both strategic and tactical nuclear systems.³⁶

A 2017 unclassified Air Force Intelligence report indicates 33 types of Chinese battlefield rockets, theater-range ballistic and cruise missiles.³⁷ Various unclassified U.S. government reports have said the DF-26 IRBM, the DF-21 medium-range missile, including the carrier killer DF-21D, new cruise missiles, China's hypersonic glide vehicle and an air-launched ballistic missile are nuclear capable.³⁸ The Taiwanese Defense Ministry has said that the DF-11 short-range ballistic missile is nuclear capable.³⁹ The

new short-range Chinese DF-15 ballistic missile is also reported to be nuclear capable.⁴⁰ Russian experts credit much of China's conventional missile force with dual capability (nuclear and conventional).⁴¹

While China officially proclaims a nuclear no first-use policy, this claim is very questionable. Col. (ret.) Larry Wortzel, a Commissioner on the U.S. China Economic and Security Review Commission, has emphasized that China's no first-use formulation is essentially meaningless.⁴² Japan's Kyodo News Agency reported that it obtained classified Chinese documents which say that China "will adjust the nuclear threat policy if a nuclear missile-possessing country carries out a series of air strikes."⁴³ A number of Chinese generals have made first-use threats.⁴⁴ China is now copying Russian nuclear capable bomber flight threats and provocations.⁴⁵

In light of Chinese efforts to rewrite the political map of the Far East and its outstanding border disputes, the growth of Chinese military and nuclear capability is quite threatening. China has illegally seized territory and built military bases on artificial Islands in the South China Sea. The 2017 Pentagon China report observed, "In recent years, China has adopted a coercive approach to deal with several disputes that continue over maritime features and ownership of potentially rich offshore oil and gas deposits."⁴⁶ The Chinese have precipitated dangerous confrontations in the air and at sea with the U.S. and Japan. China's growing nuclear capability makes these confrontations more dangerous.

THE STATE OF AMERICA'S NUCLEAR ARSENAL

These developments, and increasing North Korean and possibly Iranian nuclear capabilities, have major implications for U.S. nuclear deterrence requirements. Due to decades of neglect, the U.S. is the only nuclear weapons state without a fully functional nuclear weapons production complex. The U.S. lacks the ability to produce tritium, a vital nuclear weapons ingredient.⁴⁷ A bigger problem is the lack of significant pit (the fissile material component of a nuclear weapon) production capability. The estimated life span of a pit is 45–60 years.⁴⁸ The current average age of America's nuclear weapons is 35 years.⁴⁹ This means that in as little as 10 years we could see a collapse of the U.S. nuclear deterrent. These critical

problems must be corrected promptly.

What do we need to deter? Certainly we need sufficient and flexible nuclear capabilities against both large and small scale, high and low-yield nuclear attack. As described by the Commander of the Russian ICBM force in 2009, "In a conventional war, they [Russia's nuclear ICBMs] ensure that the opponent is forced to cease hostilities, on advantageous conditions for Russia, by means of single or multiple preventive strikes against the aggressors' most important facilities. In a nuclear war, they ensure the destruction of facilities of the opponent's military and economic potential by means of an initial massive nuclear missile strike and subsequent multiple and single nuclear missile strikes."⁵⁰ The Minimum Deterrence Left ignores this and argues that any form of nuclear attack can be deterred by the threat of targeting adversary cities, something that the U.S. does not do.⁵¹ In the 1980s, a far more sensible period with regard to nuclear deterrence, then-Secretary of Defense Caspar Weinberger noted, "Such a threat is neither moral nor prudent. The Reagan Administration's policy is that under no circumstances may such weapons be used deliberately for the purpose of destroying populations."⁵² According to Admiral (ret.) Richard Mies, former commander of STRATCOM, "...our present and longstanding targeting doctrine of flexible response — [is] a doctrine designed to hold at risk our potential adversaries' military forces, war-supporting industry, command and control capabilities, and military and national civilian leadership, while minimizing to the maximum extent possible collateral damage to population and civilian infrastructure."⁵³

A key element of the Minimum Deterrence approach is that our forces should not be designed and sized to implement our actual targeting strategy. However, the welfare of their civilian population is hardly what brutal dictators value most. The Reagan administration believed we had to be able to threaten effectively "the destruction of those political, military, and economic assets they value most highly."⁵⁴ In 2013, the Obama administration rejected Minimum Deterrence and affirmed that the U.S. would maintain a resilient and flexible TRIAD capable of extended deterrence, possessing "significant counterforce capabilities against potential adversaries," and a hedge



A B-52 launches an AGM/86B Air-Launched Cruise Missile. (Air Force photo)

against the “risk in our nuclear stockpile.”⁵⁵

Counterforce capability both enhances deterrence and damage-limiting capability. The 2012 “Global Zero U.S. Nuclear Policy Commission Report” headed by General (ret.) James Cartwright pretended to support a more realistic military oriented targeting strategy but did not even look at something as basic as damage expectancy -- how much damage could we actually do to our targets.⁵⁶ Perhaps his reason was that damage expectancy would not have looked very good.

According to STRATCOM commander General John Hyten, current U.S. nuclear modernization is slow and is “not pushing the state of the art in many ways.”⁵⁷ For example, the Air Force program for a hypersonic missile will not be nuclear capable.⁵⁸

The advanced ages of U.S. deterrent system at their planned replacement dates creates the possibility of the loss of critical capability if there are unexpected problems with existing systems or delays in replacement systems. Operational patrols by the Trident missile submarine replacement will not begin until 2031. By then, existing Trident submarines will have declined from the current 14 to 10, and all of them will be older than their original 30 year design

life. In 2031, legacy U.S. delivery systems, the vast majority of our deterrent at this point, will be 35-70 years old. The Trident II missile replacement will not become operational until 2042.⁵⁹ The legacy program will not give the Trident II low-yield capability and the future of the Trident W-88 warhead, the most effective U.S. counterforce weapon, is not clear.⁶⁰

The U.S. bomber modernization program is proceeding slowly. In 2009, the Obama administration terminated the “2018 bomber” program and did not revive a bomber modernization until 2016 when the B-21 was put under contract. As Bill Sweetman has pointed out, “...the real need for a new bomber rests on the fact that only 20 U.S. bombers, the B-2 force, are capable of operating against any serious air threat, and those aircraft do not offer high sortie rates.”⁶¹ The Air Force has said the B-21 will be limited to “mature” technologies and be less capable than the 2018 bomber concept.⁶² The Air Force is pursuing the B-21 primarily because of the need for long-range conventional strike against advanced defenses. Only three percent of the cost is linked to the nuclear mission.⁶³ A new nuclear stealth cruise missile designed to be carried by older U.S. bombers, the Long Range Stand Off Weapon

(LRSO), will not be operational until 2030.⁶⁴ Until then, we are limited to the old AGM-86B nuclear cruise missile which became operational in 1981, was designed for a 10 year life and was known to be inadequate against advanced radars in the 1980s.⁶⁵

The B-2 is being given an upgrade to its defensive avionics.⁶⁶ The modernized B61 Mod 12 nuclear bomb, soon to be carried by the B-2 (and later the F-35 and B-21), incorporates a Joint Direct Attack Munition (JDAM), a guidance tail kit that converts existing unguided free-fall bombs into accurate, adverse weather-capable "smart" munitions.⁶⁷ JDAMs have enhanced accuracy and a small standoff range that help stealth aircraft penetrate defenses. However, JDAMs are hardly the best weapons against advanced defenses. Conventional JDAMs were fielded about 20 years ago. Thus, the B-2 enhancements are not particularly impressive. The legacy program of 100 B-21 bombers is certainly useful but not fully adequate.

Aging over the next 10-14 years will erode existing capabilities. For example, in June 2017, General John Hyten said replacing the existing AGM-86B nuclear air-launched cruise missile is particularly needed because it is so old, "It's a miracle that it can even fly," its reliability was "already unacceptable" and would get worse every year.

The replacement for the Minuteman ICBM, the Ground Based Strategic Deterrent (GBSD), is scheduled for initial deployment in 2027.⁶⁸ The GBSD will "address future threats, especially those that may emerge in a post-2030 Anti-Access/Area Denial environment."⁶⁹ Since the U.S. has not

designed a new ICBM for decades, there is real concern about how long the GBSD will take to develop.⁷⁰ Under the legacy program, it will not be given a low-yield warhead option.

If we get all the legacy programs in place on time, the TRIAD will be preserved, but there are concerns about our ability to deter precision low-yield strategic nuclear attacks by Russia and to target hard and deeply facilities in Russia, China and elsewhere. Moreover, there are questions as to whether our ballistic missiles will be given sufficient accuracy to accomplish their assigned targeting, about our ability to counter increasingly capable missile and air defenses in both Russia and China, and the reliability of our nuclear weapons which have not been tested for decades.

Aging over the next 10-14 years will erode existing capabilities. For example, in June 2017, General John Hyten said replacing the existing AGM-86B nuclear Air-Launched Cruise Missile (ALCM) is particularly needed because it is so old, "It's a miracle that it can even fly," its reliability was "already unacceptable" and would get worse every year.⁷¹ In 2009, then-Commander of STRATCOM, General Kevin Chilton observed that the B-2, the most modern element of current U.S. nuclear capability, is "no spring chicken" and that, "the B-52s are older and limited in what they can do."⁷²

By 2025 the B-2 bomber will have to face improved Russian air defenses including the SA-10, SA-12, SA-20, S-350, S-400, S-500, new Russian short-range defenses and advanced interceptor aircraft.⁷³ Similar advanced air defenses will be deployed by China.⁷⁴ Under the legacy program, the F-35 will not get a nuclear capability until 2025 and it will face the same defenses without nuclear standoff capability. Just after his retirement from the position of commander of the Air Force Global Strike Command, General Herbert J. "Hawk" Carlisle told Air Force Magazine, "The Air Force also must have a follow-on to the Joint Direct Attack Munition (JDAM) satellite guided bomb that is stealthy and maneuverable enough to survive the last few miles of an attack on ever-improving air defense systems."⁷⁵ The U.S. needs the same capabilities in its nuclear bombs but under the legacy

program won't get them.

Russia and China have announced they will be deploying missile defenses. Much more is known about the Russian program than the Chinese. Russia is upgrading the Moscow ABM system to the improved A-235 configuration.⁷⁶ Their main missile defense system will be the mobile S-500 which Russia says will have capabilities against ICBMs and SLBMs, aircraft, cruise missiles and hypersonic missiles.⁷⁷ The S-500 will be operational by 2020 and will be widely deployed.⁷⁸ As noted above, the GBSD will have features to deal with missile defenses but the earliest availability is 2027. There is no indication that the Navy is giving the Trident II similar capabilities. If we do not provide counter measures on our strategic ballistic missiles, we risk a serious reduction of our deterrent capability. In 2013, four well known Russian experts, Sergey Rogov, Colonel General (ret.) Viktor Yesin, Major General (ret.) Pavel Zolotarev and Vice-Admiral (ret.) Valentin Kuznetsov concluded that the planned Russian aerospace defense system could reduce U.S. damage expectancy against Russia to 10%, assuming a 450-900 nuclear weapons attack.⁷⁹ Unless we dramatically increase the number of planned Trident warheads, prompt missile defense counter measures is essential.

Enhancing the accuracy of our strategic missiles is necessary for both effective counter-force capability and deterring low-yield Russian and potentially Chinese attacks. Matthew Kroenig points out, "The lack of any legacy programs that would improve accuracy of our strategic ballistic missiles' limited counterforce damage potential increases the amount of collateral damage that would be produced. The side effect of this is reducing the credibility of our nuclear deterrent."⁸⁰ The existing legacy program was ideologically driven. The cost of low-yield weapons is literally either zero or close to it.⁸¹ These weapons can be given precision or near precision accuracy at comparatively modest cost.⁸² Low-yield strategic nuclear warheads, particularly precision low-yield warheads, on Trident SLBMs and/or Minuteman III ICBMs would substantially augment both the survivability and penetration capability, enhancing our deterrent against theater nuclear attack. Precision low-yield weapons provide a hedge against delays in restoring tritium production capability. They can

destroy targets that currently require high-yield weapons.

The legacy nuclear bomb life extension program will eliminate almost all of our capability against hard and very deeply buried facilities (HDBTs) because all of our high-yield bombs are being retired and the B61 Mod 12 will not have earth penetration capability or high yield.⁸³ HDBTs are very important targets from a deterrence and damage limitation standpoint because they "protect adversary leadership; nuclear, chemical, and biological weapons; and ballistic missiles."⁸⁴ We need better capability not less. Life extension of the B61 Mod 11 earth penetrator bomb and the B-83 high-yield bomb should be pursued.

Since 1988, the U.S. has abandoned its non-strategic or tactical nuclear TRIAD. U.S. non-strategic nuclear forces have been reduced to nuclear capable fighter aircraft. We need to recreate a non-strategic TRIAD because we are vulnerable to small nuclear attacks on fighter bases. As a result, the U.S. is unable to match in-kind the large number of types of nuclear attacks that Russia, in particular, can stage.

Two key players in the Obama administration's 2010 nuclear posture review decision process, Admiral (ret.) Sandy Winnefeld, U.S. Navy and James Miller who was Principal Deputy Under Secretary of Defense for Policy at the time, have called for a reversal of the decision to eliminate nuclear ship-launched cruise missiles in order to respond to Russian violation of the INF Treaty and its aggression in Europe.⁸⁵ They pointed out that nuclear Submarine-Launched Cruise Missiles (SLCMs) are low cost and would be a highly survivable augmentation of existing dual capable fighter aircraft. CSIS's Project Atom made a similar recommendation in a 2012 report by advocating for modifying the under-development LRSO cruise missile, which is intended to be launched from older bombers, into a nuclear SLCM.⁸⁶ The effect of this would be to restore the sea-based leg of a non-strategic nuclear TRIAD. The survivability of submarines, and to lesser extent surface-ships, would have the effect of making fighter bases less inviting targets because their nuclear destruction could not eliminate the U.S. ability to launch theater-wide in-kind low-yield strikes with non-strategic weapons. If these missiles have an anti-ship capability, they would

also serve as a deterrent to Russian nuclear strikes against naval vessels, which a Russian ambassador threatened in 2015.⁸⁷

Recreating a deterrent to Russian use of ground-launched tactical nuclear weapons is very important because of Russian violations of the INF Treaty and the likelihood that if Russia ever invades a NATO state it may depend upon such weapons to deter a NATO counterattack.⁸⁸ If the U.S. continues to observe the INF Treaty despite Russian violations, it will be limited to ground-launched missiles with ranges of less than 500-km. Putting a nuclear weapon on a short-range ballistic missile such as an ATACM would be relatively inexpensive, but a longer range version would be more useful. This probably could be done using primary nuclear devices from existing nuclear weapons being life-extended. Better yet, revival of the 155-mm nuclear shell would provide a weapon that could be carried by just about any missile and could be used for its original purpose as a nuclear artillery shell, eliminating the Russian monopoly in this area.

A DISTURBING OUTLOOK FOR THE U.S. NUCLEAR ARSENAL

Improvements to the legacy program are important because of the consequences of the failure of deterrence and the negative impact of ideology on the legacy programmatic decisions. In many instances, this would involve little or no additional cost. We need much greater emphasis on credible low-yield response capability and on dual capability than is the case under the legacy program. This is relatively cheap and would provide substantial benefits. If Russia is not in compliance with the New START Treaty in February 2018, U.S. ICBMs and SLBMs should be reloaded back to Clinton administration levels. This very low-cost solution would considerably enhance our deterrent until modernization programs bear fruit 10-15 years from now and would reduce the near term need for missile defense counter measures. However, while the legacy program would replace the existing TRIAD over about 15 years, after that our nuclear arsenal would again be on track to erode for decades. Repeating the mistakes of the past will undercut deterrence.

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Editors note: Some citations have been shortened for space reasons.

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