



U.S. Nuclear Weapons Policy in an Era of Turbulence

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Presentation Overview

I. Background on U.S. Nuclear Weapons

- a) Where we've been, where we are today
- b) U.S. Strategic forces: current and planned
- c) Declaratory and Employment Policies
- d) Ballistic Missile Defenses
- e) Arms Control and Nonproliferation

II. The Changing Strategic Environment

- a) China's Strategic Nuclear modernization
- b) The Two-Peer Nuclear Problem
- c) Disruptive Technologies and Strategic Stability

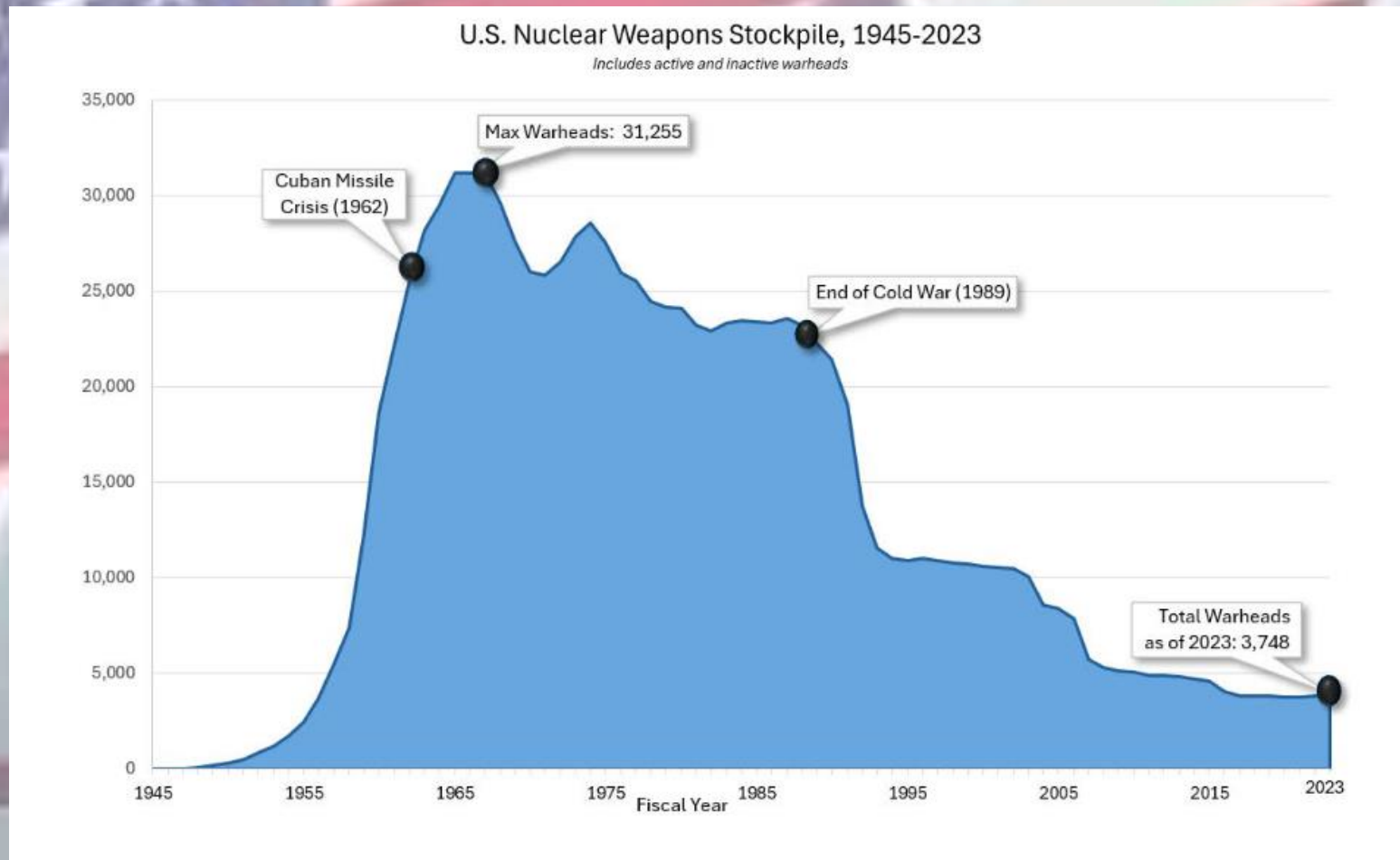
III. Key Questions for Policymakers

- a) Nuclear Forces: Numbers, kinds, how and when they'll be used?
- b) Striking the balance: The role of nuclear weapons in U.S. national security
- c) What is the future of arms control and nonproliferation?

IV. Conclusions

I. Background on U.S. Nuclear Weapons





U.S. Nuclear Weapons: Where we've been, where we are today

U.S. Nuclear Weapons Stockpile 1945-2024



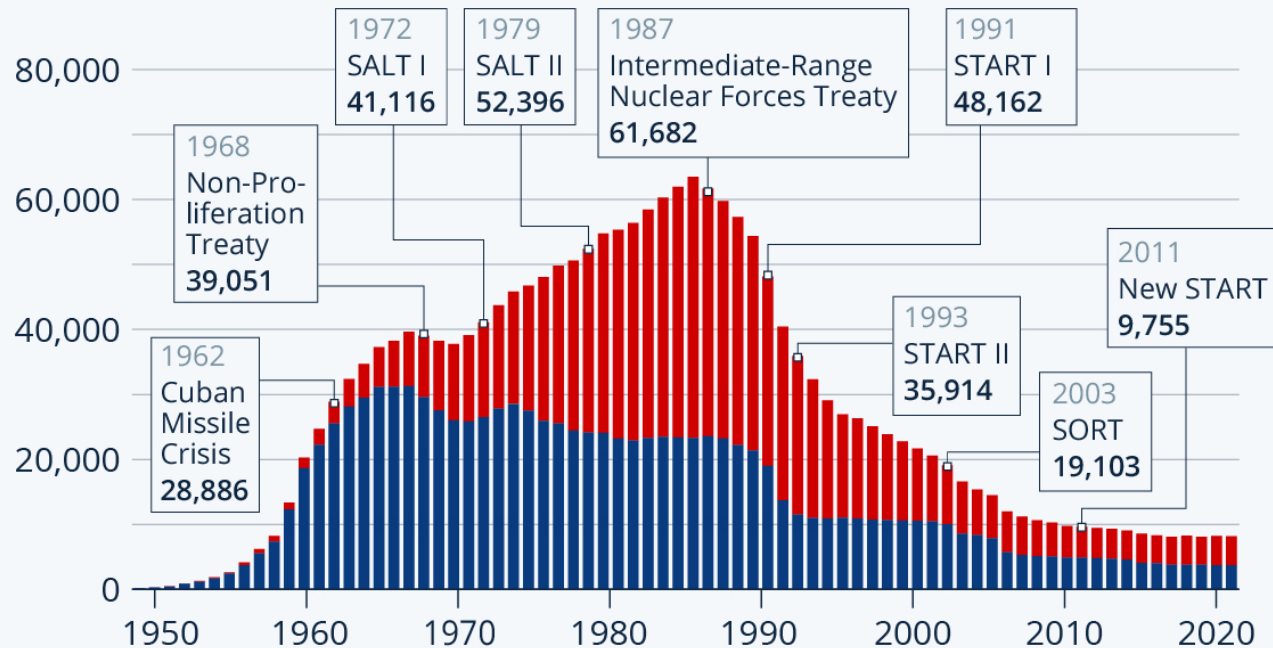
Source: U.S. Department of Defense, Federation of American Scientists, Natural Resources Defense Council

U.S. Nuclear Weapons: Deployed Strategic Warheads

How U.S. and Russian Nuclear Arsenals Have Evolved

Estimated nuclear warhead stockpiles of the United States and USSR/Russia

■ United States ■ USSR/Russia



Excluding retired but still intact warheads in the queue for dismantlement.

Source: Federation of American Scientists

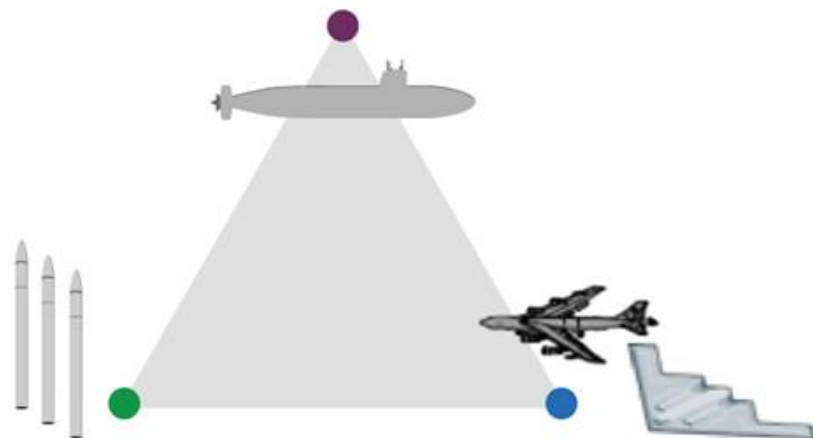


U.S. Nuclear Weapons: Comparing Superpower Arsenals

Figure 1: DOD's Current Planned Strategic Force Structure for Implementing the New Strategic Arms Reduction Treaty, Grouped by the Three Legs of the Strategic Triad

Sea-based strategic deterrent

240 submarine-launched ballistic missiles
(deployed strategic delivery vehicle), which
are carried on ballistic missile submarines



Ground-based strategic deterrent

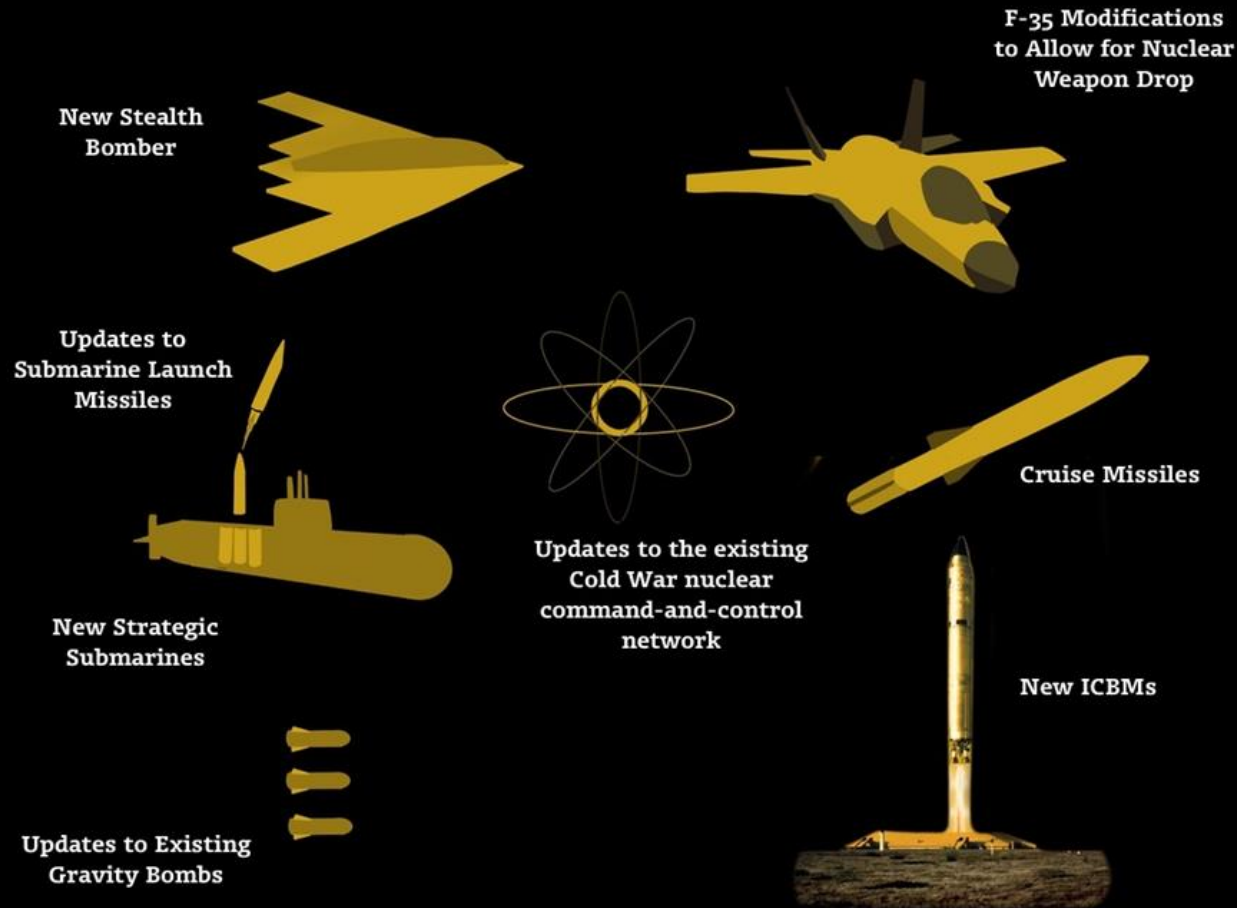
400 intercontinental ballistic missiles
(deployed strategic delivery vehicle)

Airborne strategic deterrent

60 heavy bombers (deployed strategic
delivery vehicle)

U.S. Strategic Nuclear Forces: The Triad

Pentagon's Nuclear Modernization Budget



The Strategic Modernization Program of Record

Sea Launched Nuclear Cruise Missile (SLCM-N) ??

Rebuilding the Strategic Triad

Table 1: Currently Fielded and Replacement Nuclear Triad Delivery Systems, Missiles, and Nuclear Weapons

Current delivery systems and missiles	Current nuclear weapons	Replacement delivery systems and missiles	Ongoing replacement nuclear weapon programs ^a
<i>Ohio</i> class ballistic missile submarine armed with Trident II D-5 submarine-launched ballistic missiles	W76-1 ^b warhead W76-2 warhead W88 warhead	<i>Columbia</i> class ballistic missile submarine	W88 Alteration 370
B-52H bomber (B-52)		No replacement planned	
AGM-86B air-launched cruise missile (ALCM)	W80-1 warhead	Long Range Standoff missile (LRSO) ^c	W80-4 warhead
B-2A bomber (B-2)	B61-7 strategic bomb B61-11 strategic bomb B83-1 strategic bomb	B-21 bomber (B-21)	B61-12 strategic bomb ^d
Minuteman III intercontinental ballistic missile (ICBM)	W78 warhead W87-0 warhead	Ground Based Strategic Deterrent (GBSD) ICBM	W87-1 warhead ^e

Source: GAO analysis of Department of Defense (DOD) and Department of Energy (DOE) documentation. | GAO-21-210

Declaratory Policy: When would they be used?

The fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners. (NPR 2010)

The United States would only consider the employment of nuclear weapons in extreme circumstances to defend the vital interests of the United States, its allies, and partners. Extreme circumstances could include significant **non-nuclear strategic attacks**. Significant non-nuclear strategic attacks include, but are not limited to, attacks on the U.S., allied, or partner civilian population or infrastructure, and attacks on U.S. or allied nuclear forces, their command and control, or warning and attack assessment capabilities. (NPR 2018)

As long as nuclear weapons exist, the fundamental role of nuclear weapons is to deter nuclear attack on the United States, our allies, and partners. The United States would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its allies and partners. (NPR, 2022)

Employment Policy: How would they be used?

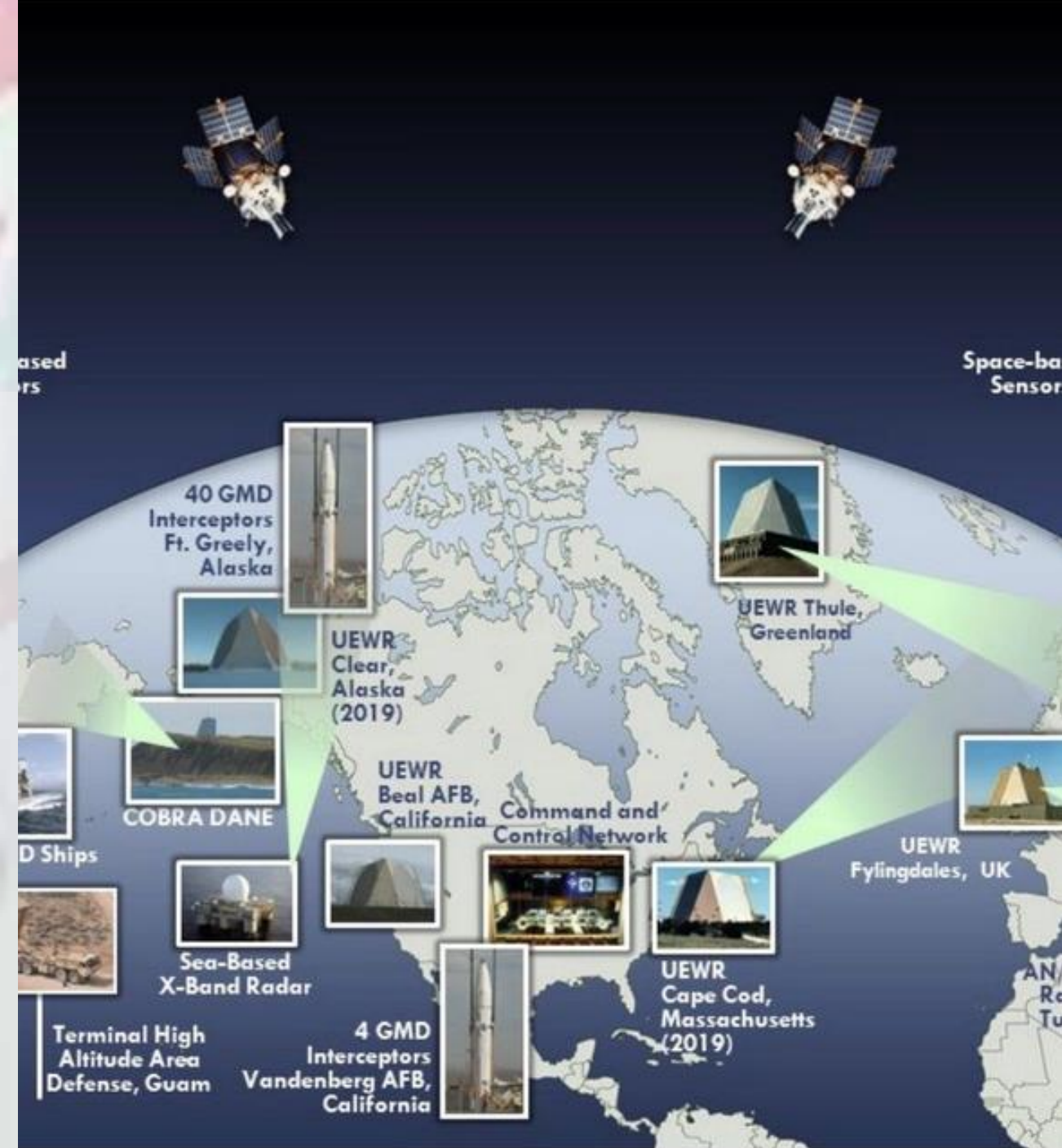
The new guidance requires the United States to maintain significant counterforce capabilities against potential adversaries. The new guidance does not rely on a “counter-value” or “minimum deterrence” strategy.... consistent with the principles of the Law of Armed Conflict. (2013 NES)

U.S. nuclear planning and targeting adhere to the law of armed conflict. The United States has for decades rejected a deterrence strategy based on purposely threatening civilian population, and ... will not intentionally target civilian populations. (2022 NES)

The Guidance continues to emphasize the need to, first and foremost, hold at risk what adversaries value most. It also reiterates the need to maintain counterforce capabilities to reduce potential adversaries’ ability to employ nuclear weapons against the United States and its allies and partners, and does not rely on a counter-value or minimum-deterrence approach.... also requires that all nuclear plans must be consistent with the Law of Armed Conflict... (2024 NES)

U.S. Ballistic Missile Defenses

- Two Sites (Alaska, California) with 44 Interceptors;
- “...GMD is neither intended for, nor capable of, defeating ... threats from Russia and the PRC.” (2022 BMDR)
- Consistent Pressures for an East Coast Site, additional interceptors



Arms Control and Nonproliferation

New START Treaty

- Signed, April 2010, entered force in February 2011, required reductions completed, February 2018; Extended for five years, February 2021; Russia “suspending participation,” February 2023 ; U.S. view “legally invalid.”
- Limits on launchers (800 total, 700 deployed) and warheads (1550 deployed); Monitoring and verification regime; Telemetry exchanges, notification protocols, and on-site inspections.
- Current U.S. strategic arsenal and modernization program sized to conform with New START Limitations
- With Russian “suspension,” information sharing has ceased; State Department has reported Russian compliance with Treaty limitations;
- New START will expire in 2026; No formal diplomatic foundation of U.S.-Russia strategic relations since 1972.

Arms Control and Nonproliferation

Supporting the **Nonproliferation Treaty (NPT) Regime** has been a priority of U.S. strategic policy.

For example, the Obama Administration Nuclear Posture Review included:

- Concrete steps toward a “world without nuclear weapons”
- Reducing U.S. reliance on nuclear weapons
- Negative Security Assurances – “the United States will not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the Nuclear Non-Proliferation Treaty (NPT) and in compliance with their nuclear non-proliferation obligations.”

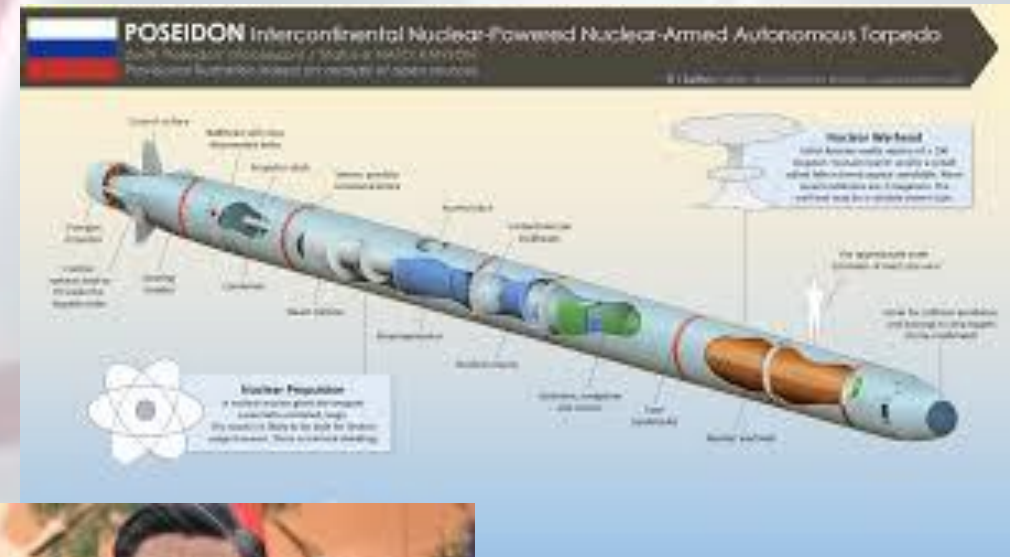
Subsequent NPRs have upheld commitment to the NPT, but the Trump administration prioritized the need for greater forces rather than further reductions and considered the need for testing; The Biden administration NPR stated that arms control, risk reduction and nonproliferation are “mutually reinforcing tools for preserving stability...”

Arms Control and Nonproliferation

Additional Developments:

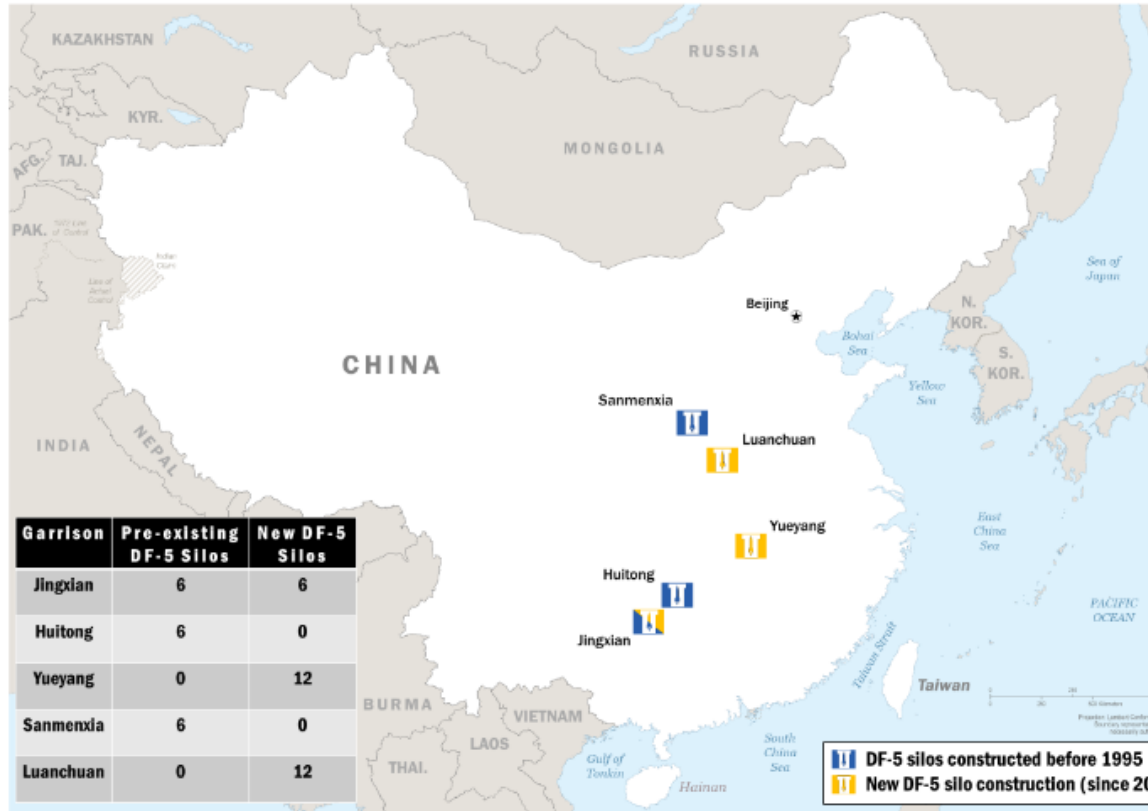
- **INF Treaty:** Signed in 1987, banned ground-based missiles (ballistic or cruise/conventional or nuclear) of ranges of 500-5500 km from U.S./Soviet (later Russian) arsenals; U.S. expressed concern about Russian development and testing in 2014; U.S. withdrew in August 2019
- **Open Skies Treaty:** Signed in 1992, initial concerns about Russia's compliance in 2014, U.S. withdraws November 2020; Confidence building measure allowing observation flights over territory, support transparency;
- **Strategic Stability Dialogues:** U.S.-Russia (July 2021-January 2022) met three times to find a path forward after New START; derailed by Ukraine War; U.S.-China (November 2023) "Candid, in-depth discussions," May 2024 Geneva meeting on AI; "PRC has shown no interest in engaging..."
- **Multilateral Initiatives:** "Military Use of AI and Autonomy" document released, February 2023; Endorsed by 54 states as of May 2024. Space.
- **Unilateral Moratorium:** Direct Ascent destructive ASAT capacity, April 2022

II. The Changing Strategic Environment



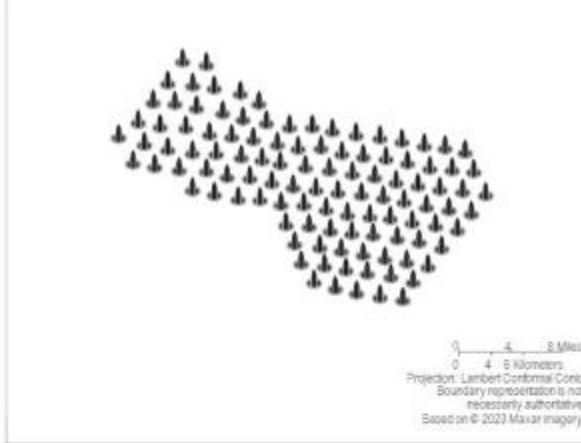
China's Nuclear Modernization

CHINA: PRE-EXISTING AND NEW DF-5 SILOS



“The PLA seeks a larger and more diverse nuclear force.... DoD estimates that the PRC will have over 1000 operational nuclear warheads by 2030.... The PRC has approximately 400 ICBMs in its arsenal, all of which can reach CONUS.” – CMPR 2024

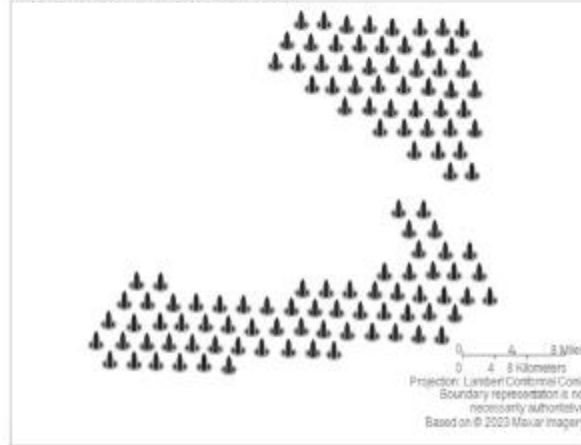
Hami Silo Field: 110 Silos



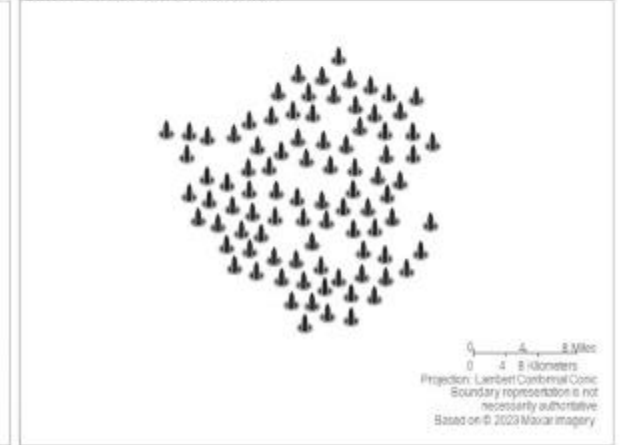
Silo Field Locations in China



Yumen Silo Field: 120 Silos

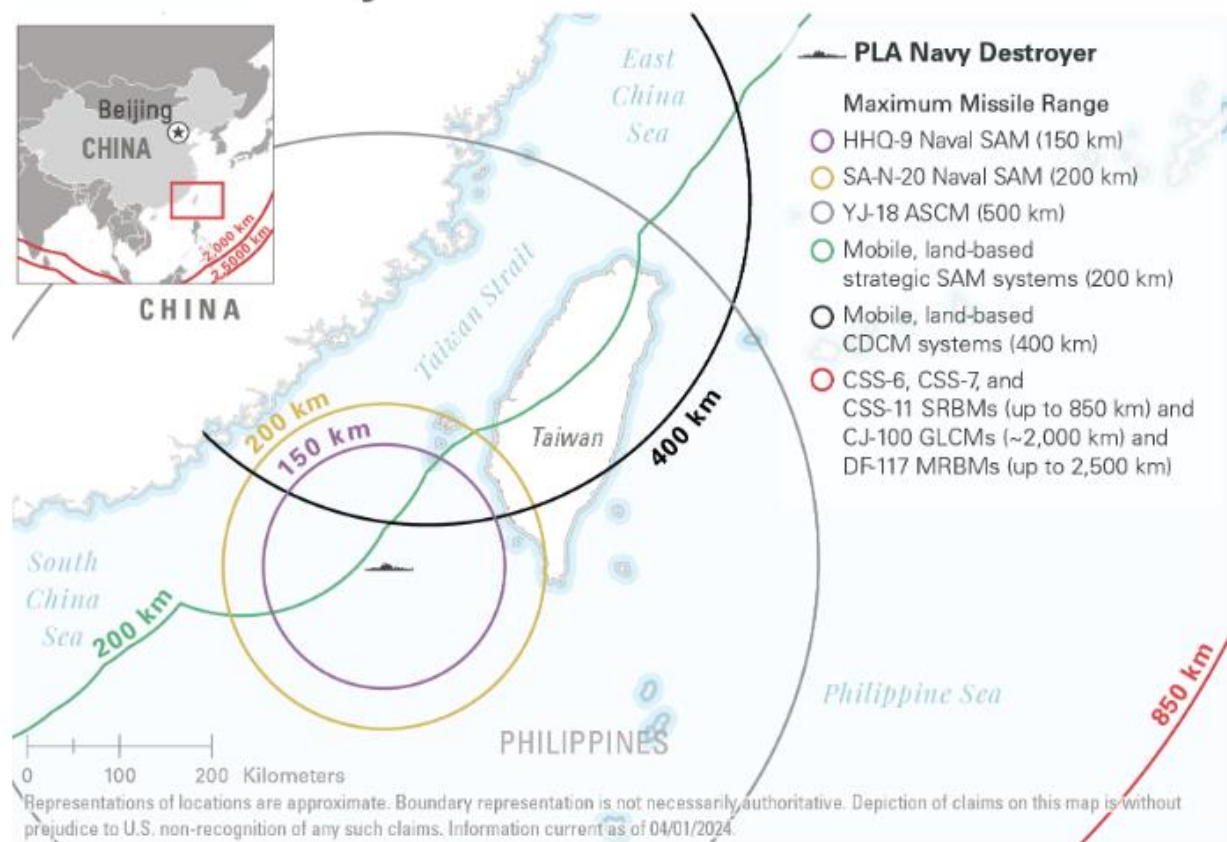


Yulin Silo Field: 90 Silos

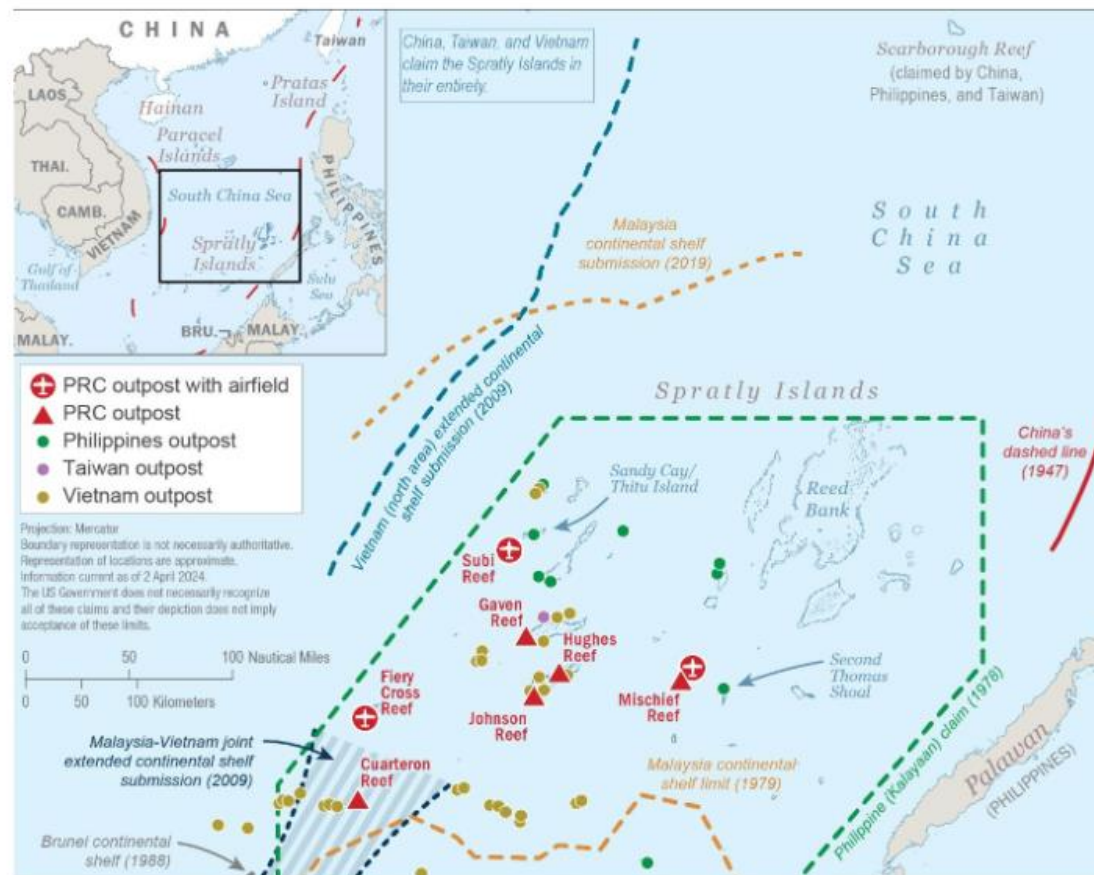


China's Modernization in Context

PRC MISSILE COVERAGE OVER THE TAIWAN STRAIT



OUTPOSTS IN THE SPRATLY ISLANDS AND SELECT DISPUTED FEATURES



By late 2018, PRC concerns... that the United States would use low-yield weapons against its Taiwan invasion fleet [led to calls] for proportionate response capabilities. (CMPR, 2024)

The “Two Peer Nuclear Problem”

The rapid growth of China’s strategic nuclear arsenal, and increased cooperation between Russia and China (and among them and North Korea and Iran) arising from the Ukraine war has created a new strategic challenge, the “**two peer nuclear problem**” (or the “Axis of Aggression”), which has created two daunting scenarios for U.S. planners:

- 1) Coordinated strategic attack: Beijing and Moscow actively plan and execute a strategic attack on the United States and its allies. [Deter/Defeat both]
- 2) Opportunistic aggression: Either Beijing or Moscow use a crisis or military conflict involving the other to launch a war against U.S. allies or partners in its own region. [Defeat one while deterring the other]

In East Asia, potential coordination or opportunism by either PRC and/or DPRK has been considered as an important “subset” of the two-peer problem.

This challenge has created pressures to revisit U.S. strategic policy and sparked important questions for decisionmakers”

Disruptive Technologies and Strategic Stability

- Offensive Cyber Operations:
 - Nuclear Command, Control, and Communications (NC3) [Counterforce]
 - Critical Infrastructure Strategic Effects [Countervalue]*Potential for overconfidence, risk taking, rapid escalation*
 - Advanced Conventional Weapons (ACW)
 - Hypersonic Glide Vehicles [Fractional Orbital Bombardment System]
 - Hypersonic Cruise Missiles
 - Conventional ICBMs*Possibilities for “conventional counterforce,” decapitation, first-strike*
 - Space (Satellite vs ASAT; network resilience; entanglement dangers)
 - Autonomous Systems, Artificial Intelligence, Big Data, Advance Sensors
- New potential drivers of first-strike incentives (prevention/preemption), decision time compression, pathways to rapid escalation, challenges for conflict termination;*

III. Key Questions for Policymakers



U.S. Nuclear Forces

- **How much is enough?**

- The current program of record is “necessary but not sufficient.”
- Requisites of counterforce doctrine vs two adversaries
- Expanding planned capabilities in modernization program
- Uploading existing deployed systems, post-New START
- Enhanced strategic defenses?

- **What types do we need? To do what?**

- A “new generation” of tactical and theater nuclear weapons?
- Extended deterrence challenges against nuclear adversaries
- Forward deployed, graduated, limited options;
- Maximize deterrence, reassurance, minimize escalation/threat to homeland

Declaratory and employment policies?

Recognition of the Two Peer Nuclear Problem has spurred a discussion of alternative approaches to U.S. declaratory and employment policies, considering the perceived force structure requirements implied in an unregulated, post-arms control environment.

- **Counterforce:** Maintain commitment of LOAC, limit damage to U.S. and allies through offensive and defensive means; U.S. strategic nuclear forces ~ PRC Strategic Arsenal + RF Strategic Arsenal +1
- **Countervalue:** Reject pretense of LOAC, acknowledge likely damage of adversary strikes vs U.S. and allies; Threaten destruction of PRC and RF cities
- **Mixed Approach:** Maintain counterforce vs regional allies, single peer; Threaten destruction of second peer, both in large-scale war
- **Alternative Targeting Approaches:** Rejecting pure counterforce, adjust forces to hold at risk infrastructure, mix of strategic and conventional military targets, avoid civilians per se

No easy answers; Size and costs of forces vs principles, effects of war

Nuclear Weapons in U.S. National Security

There is growing support within the U.S. defense community for a greater reliance on nuclear weapons to achieve national security objectives.

Any such shift in policy should be considered in the context of these issues.

- **Conventional Military Needs:** Most pressing deterrence challenges today (Taiwan, NATO Eastern Flank) are conventional; Restoring conventional edge
- **Defense Industrial Base Issues:** Severely constrained, under capitalized, struggling to deliver conventional and nuclear platforms/munitions
- **Nuclear Enterprise Challenges:** Even with over a decade of investment and recapitalization, limited progress toward planned objectives; significant infrastructure, workforce, capacity issues
- **Budgetary Realities:** POR estimated at \$1.7 TR (from \$1.2) until 2035; Current defense budgets \$900B; Even with further spending, harsh tradeoffs between nuclear/conventional/R&D

Arms Control and Nonproliferation

Russian withdrawal from New START, Chinese lack of interest in dialogues, and U.S. inconsistency across administrations has placed arms control, risk reduction, and nonproliferation in dire straits.

- Will nonproliferation remain a central objective of U.S. national security policy?
- Can the United States rebuild and possibly expand its strategic arsenal in ways that could leave open doors to future strategic arms control agreements?
- Will U.S. leaders continue to see value in pursuing potential arms control initiatives in bilateral or multilateral venues? Cooperative risk reduction?
- Can/will Moscow, Beijing play constructive roles in addressing new disruptive technologies that could threaten strategic stability?

IV. Conclusions

- It's grim out there!
- The strategic environment is challenging.
- The United States maintains significant capabilities and levers of influence to achieve national security objectives.
 - Long standing alliances; Formidable collective capacity and potential
 - Existing nuclear capabilities, reserve stocks
 - Finite, but formidable resources (ability to build up, smartly)
- Like hope, “panic is not a strategy,” clear-eyed strategy is needed
- Nothing precludes U.S. modernization of a “safe, secure, effective” nuclear arsenal that addresses deterrence challenges, reassures allies, allows for conventional force modernization, and robust R & D in critical technologies, while also leaving open the possibility for constructive arms control negotiations, supporting nonproliferation objectives and reducing collective risk.