On Assuring and Deterring:
Novel Messaging and the Case for Testing

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"Achieve U.S. objectives if deterrence fails."
—2022 Nuclear Posture Review

A Historical Backdrop for Deterrence and Assurance

The 2022 Nuclear Posture Review (NPR) outlines three primary roles for U.S. nuclear weapons: deterring strategic attacks, assuring Allies and partners, and achieving U.S. objectives if deterrence fails.[1] To understand the importance of these roles, consider the atomic bombings on Japan in August 1945, which led to the end of World War II. After its employment of nuclear weapons in Hiroshima and Nagasaki, the United States was uniquely positioned as the sole nuclear power. This position of power enabled it to assure its Allies and deter further conflict—at least until the Soviet Union's successful nuclear test in August 1949, code-named Joe-1, and the subsequent outbreak of the Korean War in 1950. Since the 1940s, nuclear weapons have proliferated. New delivery methods have been developed and tested and America adapted its deterrence strategy to the changing world order. The 2022 National Defense Strategy observes that we "increasingly face the challenge of deterring two major powers with modern and diverse nuclear capabilities—the [People's Republic of China] (PRC) and Russia."[2]

National Nuclear Neglect

Since the end of the Cold War, our nuclear stockpile has suffered from bureaucratic neglect, particularly during the Global War on Terror. Our current nuclear deterrent survives thanks to the herculean effort of the Department of Energy (DOE)/National Nuclear Security Administration's (NNSA) nuclear security enterprise (people, infrastructure) to perform stockpile extension programs, nuclear surveillance, weapon delivery system testing, and weapons maintenance. However, to build enduring nuclear advantage, our nuclear infrastructure must be modernized and expanded to meet a future multi-polar threat for a dynamic and contested environment.

A recent bipartisan Congressional Commission Strategic Posture Report concluded that "the United

FIGURE 1: Aftermath of the atomic bombing of Hiroshima, Japan August 6, 1945.[4]

OPPOSITE: Tumbler-Snapper-Dog CN70-3473 LA-UR-06-1068 (Los Alamos National Laboratory)

States lacks a comprehensive strategy to address the looming two-nuclear-peer threat environment and lacks the force structure such a strategy will require."[3] The report offers a six-tenant foundation for future nuclear strategy: "assured second strike, flexible response, tailored deterrence, extended deterrence and assurance, calculated ambiguity in declaratory policy, [and] hedge against risk."[5] The report also offers findings and recommendations to support "replacement of all U.S. nuclear delivery systems, modernization of their warheads, comprehensive modernization of U.S. nuclear command, control, and communications, and recapitalizing the nuclear enterprise infrastructure at the DOD and DOE/NNSA."[6] This six-tenant foundation restores the hedging role of nuclear weapons and prioritizes a lethal, sustainable, resilient, survivable, agile and responsive nuclear deterrent and Joint Force. By comparison, the 2022 NPR devalued and underemphasized the need and role of nuclear weapons as the backdrop to our national security and defense strategies. The commission report should be a key formulative document in the next administration's rewrite of the NPR.

Since the introduction of the most recent nuclear weapons, the NNSA has continued to manage and maintain the nuclear stockpile. "All U.S. nuclear weapons in the current stockpile were designed and produced in the 1970s and 1980s, with an original design life of 20 years. Since the end of U.S. nuclear production in 1991, the United States has developed and executed [Life Extension Programs] (LEPs) for weapon-types in the legacy Cold War stockpile."[8] Constrained resources, insufficient for the development of entirely new weapons have continued even as our stockpile has exceeded its intended life. Meanwhile, the PRC and Russia are increasing the role of nuclear weapons in their national strategies and plans as they expand their arsenals.[9]

Without a strategic course correction, as recommended by the Strategic Posture Commission Report, our adversaries' nuclear capabilities could surpass our own in the near future. Capability (weapon type, yield, and delivery system) should not be confused with quantity or number of stockpile nuclear weapons and is the basis for tailored and integrated deterrence strategies. As explained in the 2022 National Defense

Aging of the Legacy Stockpile

Warhead Type	Date of Entry into Stockpile	Planned LEP[1]	First Prod. LEP	Planned Repl.[2]	Projected FPU[5] for Replacement	Nuclear Component Age at Initial Replacement[6]
B61-3/4*	1979	B61-12 LEP	2020	FAW[3]	~2040–2050	~60–70 yrs
B61-7/11**	1985/1997	B61-12 LEP	2020	FAW	~2040–2050	~60–70 yrs
B83-1**	1983	Retired by 2025	n/a	n/a	n/a	n/a
Cruise Missile W80-1	1982	W80-4 LEP	2025	FAW	~2040–2055	~60–75 yrs
SLBM W76	1978	W76-1 LEP	2008	FBW[4]	~2045–2047	~65–70 yrs
ICBM W78	1979	n/a	n/a	W87-1	~2030	~50 yrs
ICBM W87	1986	Partial LEP	1999	FBW	~2035–2040	~50–55 yrs
SLBM W88	1989	Alt 370 Refresh	2022	FBW	~2035–2040	~45–50 yrs

* Non-strategic bomb ** Strategic Bomb [1] Life extension programs (LEP) reuse nuclear components [2] Replacement requires nuclear component production [3] Future Air-Delivered Warhead (FAW) timeframe identified; characteristics to be determined [4] Future Ballistic Missile Warheads (FBW) initial studies planned; diversity and characteristics to be determined [5] First Production Unit [6] Replacement dates are notional

FIGURE 2: Aging of the Legacy Stockpile[7]

Strategy, tailored deterrence is specific to certain problems, competitors, circumstances, and strategic goals and is achieved by a holistic approach of integrated nuclear and non-nuclear options – including "combinations of conventional, cyber, space, and information capabilities."[10] However, it should be considered that the ability for the U.S. to hold the nuclear forces of two near peer competitors at risk—and potentially simultaneously—does in fact come down to a minimum viable deterrent and math. These concerns were highlighted in the recent Senate Armed Service Committee Fiscal Year 2025 U.S. Strategic Command and U.S. Space Command Posture Hearing in March 2024. General Cotton, USSTRATCOM Commander, emphasized the critical need to continue the modernization of our nuclear triad, noting:

> "While our legacy systems continue to hold potential adversaries at risk, it is absolutely critical we continue... at speed with the modernization of our nuclear triad... The PRC is surpassing the United States in its number of fixed intercontinental ballistic missile launchers. Projections indicate its nuclear arsenal could encompass approximately 1,000 warheads by 2030... Beyond Russia's traditional strategic triad, it is expanding and modernizing nuclear options that are not covered by international arms treaties."[11]

Modernization efforts for our nuclear triad and nuclear communications, command, and control (NC3) systems must continue. While the NNSA has a plan to modernize our nuclear arsenal and supporting infrastructure, it remains uncertain whether our existing stockpile will be sufficient to maintain deterrence or if new adversary capabilities will negate the deterrence value before our own efforts are realized. Given current trends of adversarial development of new delivery platforms and increases in nuclear stockpiles, the United States must find innovative solutions to close the gap with the PRC and Russia.

Novel Messaging and Nuclear Testing

To assure Allies and deter adversaries through 2030 and beyond, the U.S. must unequivocally demonstrate its will and ability to use its nuclear weapons and capability to fight and win large-scale combat operations (LSCO) in a nuclear environment. This is the foundational principle of the Army's Conventional Nuclear Integration (CNI) Strategy published in 2022. Critical to this strategy is an integrated Joint and Combined Force which "exploits its resiliency advantage" to create and seize advantage across the competition continuum.[12] As it stands currently, U.S. nuclear deterrence is at best visualized by test launches of non-nuclear proxy devices, and modest integration of strategic nuclear delivery systems in Geographic Combatant Command (GCC) exercises. Exercises and training must pivot from employment of nuclear weapons as an end-scene but as a scene setter. Considering PRC provocations in the South China Sea and the Russian invasion of Ukraine, new options should be explored to integrate nuclear weapons into Joint multilateral exercises, evaluations or assessments.[13] Furthermore, it may be time to seriously examine the merits of restarting nuclear weapon testing. Not necessarily for yield or scientific purposes. The NNSA attests current hydrostatic testing is sufficient for guaranteeing the current nuclear stockpile.[14] Instead, the United States should restart nuclear testing for the strategic and operational

FIGURE 3: Soldiers observe a nuclear detonation and conduct maneuvers during Desert Rock Exercises.[15] Radiation exposure to personnel during exercises was militarily insignificant with most participants receiving a dose of less than 1 rem and the highest observed dose being just over 5 rem."[16] By comparison, the radiation exposure of a single full-body CAT scan is approximately 1 rem.

benefits provided to our Allies and Joint Force. Historical precedent exists to how this can be done.

Should nuclear testing be green-lighted, the Joint Force and Department of Energy (DOE) could execute modern-day nuclear exercises akin to Operation BUSTER-JANGLE nuclear tests with Desert Rock Exercises from the 1950s.[17] These modern nuclear training exercises should focus primarily on the detonation of the nuclear device or weapon in a controlled setting, combined with nuclear delivery system test launches with mock payloads, and follow-on Joint Force maneuver. Such tests could combine one or more nuclear delivery system such as an intercontinental ballistic missile (ICBM) launch, surfacing a ballistic missile submarine (SSBN) in an annual exercise, such as Rim of the Pacific (RIMPAC) Exercise, or dropping a tactical nuclear Joint Test Assembly (JTA) payload using dual-capable aircraft (DCA). While these tests are routine themselves, the integration of the mock payloads and controlled device detonation is key to enhance integrated deterrence. Mock payloads could also target Soviet-era or PRC mock-ups of nuclear forces or command and control systems at the Nevada National Security Site (NNSS) to further communicate cost-imposition and coercive goals. Following detonation of the nuclear device, land forces should then conduct maneuvers in, around, and through the nuclear environment–demonstrating benefit denial.

While such an exercise would be inherently escalatory, the operation would take place entirely in our backyard, in a controlled environment, and at a scale unmistakably associated with testing and training at echelon. The intent of simultaneously testing a nuclear device in the desert and conducting Joint Force maneuvers in the vicinity of the detonation would showcase our readiness for multidomain operations in a nuclear environment. These exercises should be widely publicized to reinforce a global strategic message, showcasing a well-prepared Joint Force ready to prevail in a nuclear environment.

Using actual nuclear device or weapon system tests in demonstrations would provide concrete benefit denial and cost imposition to Russia and the PRC. Additionally, and equally important, it would reenforce assurances to our Allies and partners that the U.S. military is prepared to stay in the fight and “achieve U.S. objectives” through a modernized, tested, and credible nuclear deterrent. Both outcomes have crucial strategic implications and are mutually reinforcing.

Though resuming nuclear testing would have significant implications, particularly concerning test ban treaties, these concerns pale in comparison to the risk the United States potentially faces should it fail in its deterrence or assurance objectives. Additionally, if the United States loses its position as the global nuclear power, proliferation of nuclear weapons states and an uncontrolled arms buildup of global competitors may be presumed.

Credible Nuclear Deterrence

A credible nuclear deterrent underpins our national strategic defense and military policy. As such, nothing should impede the United States in pursuit of a modernized security enterprise, tested nuclear arsenal, and proven Joint Force. Conventional-Nuclear Integration and strategic messaging is crucial for achieving deterrence value for both our Allies and competitors. To that end, the U.S. should restart nuclear testing and use novel messaging of CNI in exercises at all echelons to train a resilient Joint Nuclear Force, achieve national strategic objectives, deter its adversaries, and hedge against rising global threats. Just like in August 1945, achieving assurance and deterrence begins with using our nuclear weapons and dominating the strategic narrative. ■

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