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A THEATER VIEW ON THE NUCLEAR SEA-LAUNCHED CRUISE MISSILE (SLCM-N)

DOES OPTIONALITY OUTWEIGH WARFIGHTING COSTS?

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Recent world events, new U.S. policy decisions, and budget requests have led to renewed discussion on a specific type of nuclear weapon: the Sea-Launched Cruise Missile-Nuclear (SLCM-N). The following article examines the utility of SLCM-N, considering a geographic combatant command or theater perspective, in terms of stated U.S. policy, military planning doctrine, and associated opportunity costs. Unique in its consideration of the effect of a reintroduction of SLCM-N into a theater in a holistic manner, this analysis reveals that being able to offer a SLCM-N option to the President of the United States would actually reduce the overall number of military response options should there be an attack against the United States, a U.S. ally or partner, and the capacity for a geographic combatant commander to execute them.

BACKGROUND

The U.S. Navy began deploying nuclear-armed Tomahawk cruise missiles in the mid-1980s on both surface ships and fast-attack submarines. This changed on September 27, 1991, when then President George H. W. Bush stated in a prime-time television address to the nation, that the cruise missiles would be removed from U.S. ships and submarines, with many of the warheads slated to be destroyed and the remaining ones to "be

secured in central areas where they would be available [to be deployed on fast-attack submarines] if necessary in a future crisis."[1] Viewing nuclear-armed Tomahawk cruise missiles as redundant based on being able to forward deploy nuclear armed bombers and dual-capable fighters in time of crisis, the Obama administration's 2010 Nuclear Posture Review (NPR) called for retiring the remaining systems. Citing the need for flexibility and regional presence, the Trump administration's 2018 NPR called for re-establishing a sea-launched cruise missile-nuclear capability.[2] President Biden's 2022 budget continued funding SLCM-N with a goal of deploying it in the late 2020s; however, based on the analysis behind the now-released 2022 NPR which identified SLCM-N as "no longer necessary," President Biden's 2023 budget request did not include SLCM-N funding.[3]

These policy and budgetary changes, along with Vladimir Putin's blatant nuclear threats in support of his invasion of Ukraine, China's ongoing Cold War-like expansion of its nuclear arsenal, North Korea's recent law stating its right to a preemptive nuclear strike, and continuing concerns expressed by the International Atomic Energy Agency (IAEA) about Iranian nuclear facilities, have generated debate on the merits and concerns associated with re-introducing SLCM-N to the U.S. nuclear weapon arsenal.

While much of this discussion has fallen within the larger nuclear deterrence framework, not much of the debate has taken a theater warfighting perspective into account thus far. While that makes sense as the President retains U.S. nuclear weapons authority, the current discussion misses the intent of the Goldwater-Nichols Defense Reorganization Act of 1986: "...to place clear responsibility on the commanders of... combatant commands for the accomplishment of missions assigned," and "...to increase attention to the formulation of strategy and to contingency planning... [and] provide for more efficient use of defense resources."[4] With this in mind, much can be gained from examining the potential role of SLCM-N for shaping U.S. warfighting courses of action and associated opportunity costs, considering the theater viewpoint of a geographic combatant command.

1 "Address to the Nation on Reducing United States and Soviet Nuclear Weapons | The American Presidency Project," accessed November 1, 2022, https://www.presidency.ucsb.edu/documents/address-the-nation-reducing-united-states-and-soviet-nuclear-weapons.

2 "Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N)," accessed November 1, 2022, https://crsreports.congress.gov/product/pdf/IF/IF12084.

3 "2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.Pdf," accessed November 1, 2022, https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF.

4 "Goldwater-Nichols Reorganization Act of 1986," accessed August 5, 2022, https://history.defense.gov/Portals/70/Documents/dod_reforms/Goldwater-NicholsDoDReordAct1986.pdf.

GUIDANCE ON MILITARY PLANNING

The "fundamental principles" which guide the Armed Forces of the United States in planning "joint campaigns and operations" are established in a document called Joint Publication 5-0, *Joint Planning*.[5] In this planning process, diverse staffs develop potential options, called courses of action, on how military operations can "provide options" for the Secretary of Defense and President to be used "in conjunction with other instruments of national power."[6] Part of developing these courses of action include identifying "costs (including casualties) and risks," a "timeline," "required resources and capabilities," and, most significantly, the "probability of success or failure" of the course of action to "contribut[e] to the desired national strategic objectives."[7] To do this, part of the planning methodology involves understanding "the strategic environment (e.g., policies, diplomacy, and politics)"[8] so that "a concept of operations with the highest likelihood of success" can be developed.[9]

The joint planning process also includes a validity test to help determine if proposed options can achieve strategic objectives. The test has several different criteria to ensure that courses of action are both *suitable* and *acceptable*. To be suitable, all proposed courses of action must "accomplish the mission" and "meet the conditions for the relevant end state." To be acceptable, the estimated results for a course of action must "justify the risks"– with risk defined as "the estimated probability and consequence of the joint force's projected inability to achieve current or future military objectives (risk-to-mission), while providing and sustaining sufficient military resources (risk-to-force)."[10]

APPLYING THE GUIDANCE

With this validity test in mind, are there plausible scenarios in which a geographic combatant commander might want to employ nuclear-armed sea-launched cruise missiles? Are there plausible scenarios where such employment would likely be viewed as *suitable* and *acceptable*?

To answer these questions, there are several additional questions and different aspects to consider. First, from the suitability perspective, are there operational scenarios in which a SLCM-N would "accomplish the mission?"

Certainly, there are no lack of missions where the broad application of heat, blast, radiation, and an electromagnetic pulse from a nuclear weapon could physically destroy a target. However, the consequences of a

5 "Joint Publication 5-0, Joint Planning," accessed August 5, 2022, https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp5_0.pdf.

6 "Joint Publication 5-0, Joint Planning," xiv.

7 "Joint Publication 5-0, Joint Planning," xiv.

8 "Joint Publication 5-0, Joint Planning," xxi.

9 "Joint Publication 5-0, Joint Planning," xxi.

10 "Joint Publication 5-0, Joint Planning," xiv.

nuclear blast extend well beyond the immediate area. Such a broad, indiscriminate application of destructive power would run counter to how the armed forces of democracies around the world have fought since the late 1960s. For many decades, militaries have favored weapon systems with increased accuracy and a more discriminate (or localized) application of force.

Advances in technology have enabled this trend, as already demonstrated decades ago in several military operations, including in the use of laser-guided bombs by the United States against the Long Biên and Thanh Hoa bridges during the Vietnam War;[11] Joint Direct Attack Munitions during NATO operations over Kosovo in 1999;[12] and the Small Diameter Bomb in close air support missions in Iraq in 2006.[13] Even recent reliance on defensive systems such as the Terminal High Altitude Area Defense (THAAD) weapon system with interceptors that lack an explosive warhead illustrates an operational preference for the localized application of force.[14] Fielding and employing advanced weapon systems like these, over and over again, symbolize the desire to use weapon systems that are increasingly more effective in achieving their desired results while simultaneously reducing undesired effects in the surrounding area.

This trend makes it difficult to envision a geographic combatant commander seeking permission from the President to employ a nuclear weapon against enemy forces or key infrastructure – unless conventional means were deemed incapable of accomplishing the mission, such as might be the case with a hardened underground facility.

By employing a nuclear weapon to counter a facility designed to withstand a conventional attack, an exponentially larger amount of force could be applied via a smaller sized weapon. In such a case, a low-yield nuclear weapon might meet the "accomplish the mission" suitability criterion.[15]

But would this course of action also "meet the conditions for the relevant end state" required by the suitability criterion?[16]

End states are defined in strategic guidance from the President, Secretary of Defense, and the Chairman of the Joint Chiefs of Staff, or established in coordination between the geographic combatant commander and

11 "The Emergence of Smart Bombs," accessed August 30, 2022, https://www.airandspaceforces.com/article/0310bombs/.

12 "NATO's air war for Kosovo: a strategic and operational assessment," accessed August 30, 2022, https://www.rand.org/content/dam/rand/pubs/monograph_reports/MR1365/RAND_MR1365.pdf.

13 "USAFE unit debuts small diameter bomb in combat," September 2, 2022, https://www.af.mil/News/Article-Display/Article/129522/usafe-unit-debuts-small-diameter-bomb-in-combat/.

14 "MDA - Terminal High Altitude Area Defense (THAAD)," August 30, 2022, https://www.mda.mil/system/thaad.html.

15 Note, although a hardened underground facility may be difficult to destroy, the military significance of such a facility comes from its ability to project power, produce a product, or control forces, which often requires it to rely on systems which are not deeply buried and can be destroyed or degraded without using nuclear weapons. Also, the 2022 Nuclear Posture Review states on page 20 that DoD "will leverage existing capabilities to hold at risk hard and deeply buried targets" and "working with its interagency partners and informed by existing concepts, will develop an enduring capability for improved defeat of such targets."

16 "Joint Publication 5-0, Joint Planning," III–41.

policymakers. Identifying an end state is important for understanding what would be politically acceptable at the national level. It is integral to a successful planning process as it "define[s] what constitutes victory or success (ends)."[17]

Armed with this overarching goal, the planners on a staff can focus on translating the desired political end state into military objectives and developing courses of action that use available "military capabilities to achieve the objectives (ends)," thereby satisfying the latter part of the suitability criteria.[18]

Additionally, for the case of nuclear weapons, geographic combatant commanders would also have to use "nuclear planning guidance" contained in "presidential policy documents and further clarified in other DOD [Department of Defense] documents." Such guidance is "based on national-level considerations and supports the achievement of U.S. objectives" and allows a commander to "assess the military and strategic impact of nuclear weapons employment on joint operations."[19] It is assumed that such guidance would incorporate the most recent U.S. declaratory policy on nuclear weapons, specifically:

> "*As long as nuclear weapons exist, the fundamental role of [U.S.] 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.* The United States will not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the NPT [nuclear non-proliferation treaty] and in compliance with their nuclear non-proliferation obligations."[20]

Given such guidance, a geographic combatant commander would likely deem unleashing the broad destructive force of a nuclear weapon along with its residual radiation to be unsuitable, unless such weapons were considered the only plausible means of stopping similar effects happening against the United States, an ally, or partner. Therefore, unless the *extreme circumstances* of such devastation were already being inflicted or credibly and imminently threatened, it is hard to imagine any viable course of action calling for the tactical use of any nuclear weapons.

Furthermore, U.S. declaratory policy also narrowly limits the countries which the U.S. would potentially consider using a nuclear weapon against:

1. A nuclear-armed state under the NPT (China, France, Russia, and the U.K.);
2. A state that is not party to the NPT (India, Israel, North Korea, Pakistan, and South Sudan) or;

17 "Joint Publication 5-0, Joint Planning," IV–4.

18 "Joint Publication 5-0, Joint Planning," IV–4.

19 "Joint Publication 5-0, Joint Planning," III–39.

20 "2022 National Defense Strategy," pg 9. Italics in original.

3. A non-nuclear weapon state that is party to the NPT but not in compliance with it (of which likely candidates would be Iran depending on its future compliance, or Belarus if that country accepts Russian nuclear weapons).[21]

Removing countries with which the U.S. has defensive alliance treaty obligations or long-standing cooperative military relations, and South Sudan due to the country's newness and significant ongoing domestic stability issues, leaves China, North Korea, Russia, and potentially Belarus and Iran, as the only countries which stated U.S. policy cannot rule out based on present conditions.

Then the next question becomes: what scenarios involving these few countries could result in the *extreme circumstances* where nuclear weapons use might pass the validity test?

If any of these three (or potentially five) countries invaded or used nuclear weapons against the United States, potential U.S. military response options would likely involve a nuclear response by strategic deterrence forces, rather than forces under a geographic combatant commander. Similarly, if one of these countries detonated a nuclear weapon in a manner to avoid casualties or in an escalate-to-de-escalate tactic, any U.S. nuclear response would also likely be from strategic deterrence forces for strategic purposes rather than geographic combatant command forces using a nuclear blast to achieve a theater objective.

This framework could change, however, if an attack from these countries was an invasion of an ally or a partner nation's sovereign territory, rather than the United States itself. In such a situation, planners would have to consider what effects they want to achieve, along with any accompanying negative effects, both physical and political.

In this case, desired U.S. theater-level effects would likely include stopping the advance of the enemy military force or preventing its support from logistic or assembly areas. If using a nuclear weapon in either situation could prevent a significant enough loss of life, natural resources, or enabling infrastructure, the extreme circumstances threshold for nuclear weapons use might plausibly be reached.

However, if these forces or areas were located in an allied or partner nation, it is hard to imagine the political leadership of any country requesting or concurring to a nuclear strike on their own territory. Also, employing a nuclear weapon in an allied or partner nation without conferring with their leadership would likely lead to the effective end of such an alliance, especially in terms of popular support for it. This effectively means that theater-level nuclear weapons use under extreme circumstances could only be plausible against targets located on the internationally-recognized sovereign territory of the invading country. That said, an enemy would undoubtedly view such use as an expansion of the conflict, regardless of whether or not conventional attacks had already occurred on its own sovereign territory.

21 "2022 National Defense Strategy," pg 9.

When applying these restraints together, only one plausible scenario for using a nuclear weapon to achieve a tactical results remains:

1. One or more of the five countries mentioned above invades a U.S. ally or partner;
2. The United States, ally, or key partner nation suffers losses significant enough to reach the *extreme circumstances* threshold;
3. The target for a nuclear weapon(s) would be located within the invading enemy's own internationally-recognized sovereign territory;
4. The desired effects against the target are best achieved by employing a nuclear weapon, rather than other kinetic or non-kinetic methods (which most likely means the target would be a hardened underground facility directly related to the ongoing or imminent *extreme circumstances*, such as a nuclear weapons or command facility).

Now, having validated a narrow but potentially *suitable* and *acceptable* mission for a geographic combatant commander to request to use a nuclear weapon, what would be the specific advantages gained by re-introducing SLCM-N over currently fielded U.S. nuclear bombs and low-yield ballistic missile warheads? Is SLCM-N better suited than other weapon systems, or uniquely challenged, in achieving a desired end-state?

OPPORTUNITY COSTS

To understand the impact of fielding SLCM-N from a theater perspective, I'll use the economic concept of opportunity cost, which is defined as "the value of what you lose when choosing between two or more options."[22] So, while it makes sense that the "general view," as expressed by Chairman Joint Chiefs of Staff GEN Milley, should be that the "president deserves to have multiple options to deal with national security situations,"[23] identifying the opportunity costs will help maximize the odds "that the choice you've made will have better results for you regardless of what you lose by making it."[24]

As a first step in grasping the opportunity cost, we must first consider what type of naval vessels would be armed with SLCM-N and what is required for them to be certified as SLCM-N capable.

The submarine force represents the warfighting community within the U.S. Navy which could most easily resume carrying SLCM-N because submarines alone maintain a post-Cold War nuclear weapon mission for the Navy. While surface and submarine forces carry conventional cruise missiles, the nuclear weapon-trained

22 "Opportunity Cost," *The Balance*, accessed September 6, 2022, https://www.thebalance.com/what-is-opportunity-cost-357200.

23 *Arms Control Today*, June 2022. Arms Control Association, accessed September 6, 2022, https://www.armscontrol.org/edition/june-2022?page=1.

24 "Opportunity Cost."

submarine force has a robust knowledge base for storing, maintaining, handling and deploying with nuclear weapons. This is due to routinely deploying ballistic missile submarines with nuclear-armed ballistic missiles for over six decades as part of the U.S. strategic deterrence force.

Already having an existing nuclear weapon-trained workforce and some applicable infrastructure for this mission, the submarine force would have the smaller barrier to entry compared to the surface force. With the exception of some senior officers, such as Chief of Naval Operations Admiral Gilday, and the senior-most master chiefs, most of those with practical experience in deploying with nuclear weapons within the surface force have left the service or retired.[25]

Beyond infrastructure and workforce issues, we also need to examine how the Navy fixes, trains, and deploys its submarines. In order to get "a more agile and flexible force" to surge in crisis situations, the Navy established the Optimized Fleet Response Plan. This construct supports Secretary of Defense directed day-to-day force presence levels and surge requirements by "maximizing employability with available force capacity."[26] The plan does this by "optimiz[ing] the return on training and maintenance investments" and "ensur[ing] units and forces are certified in defined, progressive levels of.... capability."[27] Each type of deployable unit in the Navy has a fleet commander approved deployment cycle, which establishes time periods designated for maintenance, pre-deployment training, and operational employability, with a stated goal of "maximizing employability."[28]

With each class of ship and submarine having specific time periods reserved for maintenance, training, and deploying overseas within a fixed period of time (notionally 36 months), adding any additional requirements would have an impact – other things in the timeline would have to be omitted or reduced, or the overall timeline would have to be extended. Either way, adding more requirements would result in geographic combatant commanders receiving forces with less training (reducing requirements or the time to train), for shorter periods of time (keeping training but reducing operational availability), or at greater intervals between deployments (lengthening the timeline).

Would a geographic combatant commander view gaining the ability to launch SLCM-N as being significant enough in terms of gaining warfighting capability to offset these accompanying adverse opportunity costs? As gleaned from annual geographic combatant commander testimony to Congress and their associated Unfunded Priorities Lists, it appears that answer would be "no." These commanders routinely ask for additional naval

25 "House Armed Services Committee Holds Hearing on the Fiscal Year 2023 Navy Budget Request," accessed September 7, 2022, https://www.navy.mil/Press-Office/Testimony/display-testimony/Article/3029896/house-armed-services-committee-holds-hearing-on-the-fiscal-year-2023-navy-budge/.

26 "OPNAV Instruction 3000.15A Optimized Fleet Response Plan," accessed September 6, 2022, https://www.secnav.navy.mil/doni/Directives/03000%20Naval%20Operations%20and%20Readiness/03-00%20General%20Operations%20and%20Readiness%20Support/3000.15A.pdf.

27 "OPNAV Instruction 3000.15A Optimized Fleet Response Plan."

28 "OPNAV Instruction 3000.15A Optimized Fleet Response Plan."

forces and conventional ordnance, but they have not expressed a formal request for SLCM-N and the topic has only come up if a senator or representative asks about SLCM-N.

Besides reducing operational employability across the deployment cycle, there are two further opportunity costs associated with arming and deploying vessels with SLCM-N. First, each nuclear armed cruise missile in a vertical launch cell would displace a conventional weapon (e.g., a conventional tomahawk cruise missile or, once they are fielded within the next several years, a conventional prompt strike hypersonic weapon).[29] Second, the decision regarding which weapons to load out on a deploying vessel would need to be made before the vessel starts its patrol. Otherwise, the vessel would have to come off station, offload the conventional ordnance, and then onload SLCM-N alongside a vessel or in a port which is certified for and has SLCM-N.

Due to relatively slow transit speeds over distances covering thousands of miles, it would likely be weeks between making a decision to load SLCM-N and for a vessel to actually be on station with SLCM-N ready to fire. While this would not be an issue for a vessel executing a continuous presence deterrence mission, having to make a decision far in advance would incur opportunity costs for a multi-mission platform in a fluid tactical situation. Commanders prefer to maximize, rather than reduce, flexibility and decision space, so they can be responsive and able to rapidly take advantage of fleeting opportunities.

Also, the U.S. Navy has slated its four converted Ohio-class guided missile submarines for decommissioning within the 2026 - 2028 timeframe. Each of these guided missile submarines can carry 154 conventional cruise missiles, which together make up over half of the submarine force's vertical launch capacity.[30] Decommissioning these four submarines at the end of their extended 42-year service life prior to having an equivalent number of vertical launch cells in the fleet, means combatant commanders will have less submarine launched missile capacity than they do now – even with the expanded capability of the Virginia-class payload module and potential extension of several Los Angeles-class fast attack submarines. This forecasted upcoming decrease in the submarine force's capacity to launch ordnance will further exacerbate the opportunity cost of loading SLCM-N that a geographic combatant commander would incur if SLCM-N were to move forward on the development timeline envisioned in the previous NPR.

This upcoming decrease in capacity will likely increase the overall demand from geographic combatant commanders for fast attack submarines to address this dip in vertical launch cruise missile capacity. Besides vertical launch, fast attack submarines are also in high demand for their ability to track and sink enemy submarines and surface ships, conduct mine warfare, support strike groups and special operations forces, and provide Intelligence, Surveillance and Reconnaissance (ISR) capabilities. As a result, commanders will need to prioritize missions for submarines within their theater and also prepare for increased contention over submarines during the annual force management allocation process between other combatant commanders.

29 "House Armed Services Committee Holds Hearing on the Fiscal Year 2023 Navy Budget Request."

30 "Guided Missile Submarines - SSGN," accessed September 7, 2022, https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2169613/guided-missile-submarines-ssgn/.

Further, due to the previously mentioned loading and transit timeframes associated with their seagoing nature, SLCM-N armed naval vessels offer less mission flexibility than a nuclear- capable intercontinental bomber. By not having to load weeks in advance or transit for days to reach a firing position, "the nation's bomber fleet is the most flexible leg of the [nuclear] triad, capable of providing massive firepower in a short time anywhere on the globe."[31] This is because a nuclear capable intercontinental bomber operating out of a nuclear capable base can load for and execute either a conventional or nuclear mission and then reach a target days or weeks faster than a naval vessel.

Should a geographic combatant commander intend to seek permission to use a nuclear weapon for tactical purposes, selecting bombers would offer more flexibility between mission sets and avoid having to commit to a weapons load out decision as far in advance as would be necessary if SLCM-N were chosen.

Another difference between naval vessels and bombers is in their ability to message via force posturing for a deterrent effect. A naval vessel operating within SLCM-N range of China, Iran, North Korea or Russia does not routinely attract the same level of attention or media interest that flying a bomber in the same area does, all the more so if it is a submerged submarine. Furthermore, any overt use of a submarine besides a port visit could hamper its mission effectiveness, which is largely derived from being able to avoid detection and be tracked.

Together, combining these platform differences between a naval vessel and bomber indicate that while a SLCM-N armed naval vessel on station would offer the fastest response time, it would come with opportunity costs in terms of force availability for other missions, less conventional weapons available for use, and reduction in mission flexibility and decision space for a geographic combatant commander.

CONCLUSION

Considering SLCM-N in terms of suitability, acceptability, opportunity cost, mission flexibility, and decision space indicates a potential gain for a very narrow mission set (to destroy hardened underground facilities on enemy territory from directly causing exceptional circumstances level of damage to the United States , an ally, or partner). This gain would be outweighed by a variety of undesirable opportunity costs (less conventional ordnance for a wider variety of missions, overall loss of available employability across SLCM-N capable type naval vessels, and reduced mission flexibility and decision space) when other currently nuclear weapons capable forces are available (bombers) to accomplish the same mission with fewer barriers to entry and opportunity costs.

31 "America's Nuclear Triad," U.S. Department of Defense, accessed September 8, 2022, https://www.defense.gov/Experience/Americas-Nuclear-Triad/.

Therefore, while the intention of providing multiple options for the president is sound, re-introducing a weapon system with as narrow a mission set as SLCM-N runs counter to such intentions, as it would actually reduce or make less effective those executable options available to the president. To deter an attack, a geographic combatant commander needs to be viewed by a potential adversary as being ready to fight and win, if necessary.[32] Saddling these commanders with weapon systems they did not seek, and with impacts they likely do not want, would be counterproductive and run contrary to Goldwater-Nichols' goal of a "more efficient use of defense resources."[33]

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32 "Potential for Great Power Conflict 'Increasing,' Milley Says," U.S. Department of Defense, accessed September 9, 2022, https://www.defense.gov/News/News-Stories/Article/Article/2989958/potential-for-great-power-conflict-increasing-milley-says/.

33 "Goldwater-Nichols Reorganization Act of 1986."