P-ISSN: 2986-3686
E-ISSN: 2798-4427

JGSS
Journal of Global Strategic Studies

Vol. 3 No. 2 December 2023

Master's Programs in International Relations
Faculty of Social and Political Science
Jenderal Achmad Yani University

E-ISSN: 2798-4427
DOI: 10.36859/jgss.v3i2.1773

Journal of Global Strategic Studies
Vol. 03 No. 02
December 2023

The Coming Hypersonic Era: Modern Weapons and Counterforce in the 21st Century

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Much of the literature on emerging hypersonic weapons discusses their ability to deliver strategic nuclear strikes, conduct nuclear counterforce, or perform traditional tactical strikes in isolation. However, with their inherent versatility, a single hypersonic weapon can perform all of these roles without reconfiguration. I explain how the versatility of these new multipurpose weapons generates ambiguity and undermines the tenets of nuclear deterrence theory. National leaders who observe HPGM deployments on their nations' borders will increasingly view HPGM weapons as tools of destabilizing counterforce, even if the deployers have defensive intentions. With HPGMs capable of traveling inter-continental distances on the horizon, policies of restraint will become necessary to clearly indicate intentions without increasing global fear of counterforce strikes.

Introduction

Seventy-seven years ago, the United States detonated the world's first atomic bomb-a device that could annihilate a city with a single charge. A new era arrived in which mankind no longer needed to wage a war that lasted years to finally lay siege to a major population center. At the time of the first nuclear detonation, the US Air Force still bore the name "United States Army Air Forces," the term "Intercontinental Ballistic Missile (ICBM)" did not exist, and Germany's new V-2 vengeance program weapon could only cross the English Channel. Technological advancements, from the introduction of ICBMs to U-2 reconnaissance aircraft, necessitated the creation of nuclear arms theory, which grew apart from conventional security theory. The sheer destructive power of nuclear weapons combined with their space-capable supersonic delivery systems required strategists to treat these weapons as delicate objects, with launch buttons always at the ready.

Nuclear war has not occurred since World War II thanks in large part to a robust strategic framework of deterrence. The strategy of nuclear deterrence uses credible,

coercive threats of pain to prevent the use of nuclear weapons by assuring the initiator that the costs will clearly outweigh any potential gains.[1] Counterforce, the doctrine of disarming strikes against an adversary's nuclear capabilities, did not see much development because of the infeasibility of any such strike. No nation could locate, target, and destroy the thousands of warheads that mature nuclear nations such as the Soviet Union possessed, or even the dozens or hundreds of warheads that budding nuclear nations held.

Today that balance has deteriorated with hypersonic precision guided munitions (HPGMs)[2] presenting a new destabilizing force in the realm of nuclear deterrence. The strategy of counterforce creates a first strike incentive proportional to the chance of the strategy succeeding. Any advances towards a more effective counterforce strategy will, using the logic of Jervis and Schelling, destabilize the world as national leaders become more suspicious of one another. For a counterforce strategy to succeed, the counterforce attacker must find a target state's nuclear weapons and destroy the weapons before the defender can launch them. Ideally, the attacker uses a small non-nuclear strike force to discourage nuclear retaliation. Thus, reconnaissance systems with greater reach and faster high-accuracy weapon platforms will make counterforce strategies more effective. Reconnaissance systems have matured rapidly over the last four decades, but weapon speeds have begun increasingly rapidly with advances in hypersonic propulsion systems. With the reconnaissance systems having already matured, HPGMs provide the final piece to creating an effective counterforce strategy separate from nuclear armageddon. HPGMs have great flexibility in the targets they can hit and they can receive new target assignments after entering the field. Leaders who observe HPGM deployments on their borders will then have to treat HPGMs as counterforce weapons regardless of the HPGM operators' intentions.

In discussing these new weapons, I begin with an assessment of the efficacy of modern counterforce and the subsequent need to treat retargetable HPGMs as potential counterforce weapons. After concluding that counterforce has become a viable strategy, I explore how HPGMs' speed and accuracy enable them to better fulfill counterforce roles than current PGMs' characteristics. Then I provide an analysis of the impact of modern weapons' retargeting abilities on nuclear deterrence theory. Finally, I provide an

[1]See (Schelling, 1960; Jervis, Deterrence Theory Revisited, 1979; 1989; Narang, 2013; Huth & Russett, 1984; Achen & Snidal, 1989; George & Smoke, 1989; Lebow & Stein, 1989; Maxwell, 1968; Weinstein, 1969; Glaser, 1989)
[2]The category of HPGMs includes munitions, typically missiles, which can reach or exceed Mach 5 (five times the speed of sound - hypersonic) at any point in flight and which have systems or subsystems capable of making mid-flight trajectory corrections (precision).

overview of the consequences for great powers, minor nuclear powers, and arms control theorists. I then finish with a proposal to adopt a grand strategy of restraint to mitigate the most destabilizing effects of target ambiguity.

The Escalation Route of Counterforce

The decision for statesmen to launch counterforce strikes has become a more serious possibility than during the Cold War. Nuclear theory for the last half decade has assumed a stable relation between nuclear armed states, with states that lack nuclear weapons rarely factoring into the equation. The game theorist Thomas Schelling outlined nuclear theory as one in which nuclear armed states made credible threats to annihilate one another's population and thus completely bypass the long conventional war that preceded an army's advance to a major population center (Schelling, 1966). Schelling recognized that the immediate effects of a nuclear strike made such a strike dangerous even more than the following casualty count (Schelling, 1966, p. 20). For a nation considering the launch of nuclear weapons, the threat must exist that the target nation will launch a counter strike and destroy the contemplating nation in order to maintain a strategic balance. The problem of commitment to use nuclear weapons requires a solution of determining when to use such weapons. Typically, nuclear theorists assume that a state will use nuclear weapons in order to either preserve the immediate boundaries of a state or in retaliation for a nuclear strike. However, one wargame study has shown that in a conflict between nuclear armed states, "players were willing to suffer major conventional defeats before considering nuclear use" (Pauly, 2018, p. 178). Deterrence in the study played a major role in determining whether participants in wargames escalated to nuclear attacks, due to the expected reciprocal response (Pauly, 2018, p. 179). Strategic stability can then exist as long as a state with nuclear weapons assumes that the use of said weapons will incur a nuclear counter attack.

The question remains of whether leaders will actually use such weapons during a time of war. Reid B.C. Pauly of Brown University conducted the aforementioned study which showed that leaders will favor restraint when determining whether to use nuclear weapons. The study used a sample of 26 wargames to determine the thresholds for nuclear use among key decision makers in states (Pauly, 2018, p. 160). Using the variables of deterrence, practicality, ethics, precedent, and reputation, the wargames took place with 24 out of 26 players choosing not to employ nuclear weapons. Above all, players who did not initiate nuclear attacks withheld their weapons out of fear of retaliation from hostile nuclear players. The only two instances of nuclear use occurred

when fighting against non-nuclear armed adversaries. A weak point of the study came from Paul's use of China, Russia, and the United States as players without including any of the smaller nuclear-armed states.

For counterforce theory, the decision not to use nuclear weapons even when facing heavy losses presents a clear problem if using Schelling's logic. From Schelling's standpoint, the threat of nuclear use, no matter how irrational suicidal maneuvers may appear, keeps attackers at bay. When considering counterforce strikes, a strike against a defending country's nuclear forces may not escalate to the level of reciprocal nuclear exchange. Using the study's conclusions, if a defender suffers an attack that destroys the majority of the defender's nuclear strategic forces but not major population centers, then the counterforce attacker may determine that the defender will not conduct a nuclear retaliatory strike. Since major population centers serve as the targets of deterrent strikes, a counterforce strike does not guarantee that a defender seeking a reciprocal strike will counterattack the initial aggressor's population centers. However, the defender retaliating against the attacker's population centers, if even possible after a counterforce strike, incurs the equally high risk of the attacking nation directly targeting the population centers in a third strike against the crippled defender. As a result, deterrence logic can form an even more perverse paradox than normal where the deterrent effect of nuclear weapons enables escalation all the way to a counterforce strike without nuclear attacks against cities occuring.

A second study of counterforce escalation explores the route that Chinese strategic planners may take in response to a strike against Chinese nuclear forces. Caitlin Tamaldge's study makes an important point by recognizing that conventional military preparations infringe on the realm of counterforce (Tamaldge, 2017, p. 51). Any planning to neutralize bombers, submarines, and missile batteries can easily translate to plans to destroy nuclear bombers, nuclear submarines, and nuclear missile silos. A counterforce strike could accompany a conventional war as a way of neutralizing an adversaries' nuclear strike option. In the study's scenario of a war between the US and China over Taiwan, strikes against the Chinese mainland could occur in order to disable air bases and naval installations (Tamaldge, 2017, pp. 66-68). While in such a situation the US may not directly target nuclear weapons, the idea of waging a conventional war in the skies above the Chinese mainland while accepting the risk that a barrage of nuclear-armed missiles may launch against the US comes across as hard to believe. Assuming the outbreak of a conventional war between nuclear-armed states, then the opportunity to cripple an adversary's guaranteed ability to strike becomes more appealing.

E-ISSN: 2798-4427
DOI: 10.36859/jgss.v3i2.1773

Counterforce Feasibility in the 21st Century

No counterforce strike has ever occurred. Many mature nuclear-armed nations have attempted to stop the proliferation of nuclear weapons in prospective nuclear states from South Africa to Iran, but not to destroy the arsenals of nations that already have weapons. In the case of North Korea, the US has used sanctions against the regime but has not threatened a strike designed to destroy the weapons with force. Part of the rationale of restraint has resulted from the simple fact that conducting a single strike with the accuracy and force to destroy a country's nuclear weapons could not occur before. Weapons did not have the accuracy or the speed to destroy hardened (armored) targets. Furthermore, nations could not reliably determine the exact location of the hundreds or thousands of warheads that a nuclear state possessed. Major technological advancements over the last three decades however have made counterforce strikes possible.

Keir Lieber and Daryl Press examined the implications of massively improved munitions accuracy on counterforce theory. Lieber and Press point to the introduction of advanced computers which have substantially improved the capabilities of weapons as the main driving factor in counterforce change (Lieber & Press, 2017, p. 10). Lieber and Press make an important point that nuclear arsenals have not proven as inherently survivable as some may assume (Lieber & Press, 2017, p. 15). The fact that states with nuclear weapons have continued to compete intensely in the conventional military realm does not only have to do with projecting power but maintaining national and nuclear defenses. If nuclear weapons proved inherently survivable, then no security competition should occur among nuclear armed states (Lieber & Press, 2017, p. 15). But credibility thresholds and survivability remain questionable, and as degrading assessments of either appear, opportunities to exploit weakness emerge. According to Lieber and Press, three factors form the basis of nuclear weapons protection: hardening, concealment, and redundancy (Lieber & Press, 2017, p. 16). Counterforce attacks must thus successfully neutralize a large number of diverse and stealthy weapons. Targeting nuclear weapons typically requires that the targeting entity possess weapons which can penetrate the armor of hardened silos and which can locate mobile missile launch platforms. Accuracy plays the determining role in the ability to destroy underground armored nuclear missile silos. The accuracy of Sea Launched Ballistic Missiles (SLBMs) has increased from a 9% hardened target kill chance to 80% since 1985, and Intercontinental Ballistic Missiles have increased from ~57% to 80% (20% failure factor for both). However, these two statistics complement massive increases in reliability for missiles to include rapid

retargeting capabilities that can adapt to failures mid-launch (Lieber & Press, 2017, p. 20;23;24). Even worse for nuclear stability, the authors calculate that a weapon needs only a 10-15 meter accuracy window in order to successfully deliver a nuclear strike that does not kill beyond the target facility (Lieber & Press, 2017, p. 30).

New advances in targeting have further assisted the decline in nuclear survivability. Reconnaissance assets have become much more effective in locating nuclear forces than in the preceding century. For the triad, nuclear submarines, mobile launchers, silos, and bombers no longer have the ability to hide during peacetime. Modified Synthetic Aperture Radar (SAR) satellites enable operating countries to make regular passes over hostile territory and determine the locations of both fixed launch points and mobile points intermittently (Lieber & Press, 2017, pp. 38-42). Lieber and Press then mention that when combined with airborne surveillance systems, these satellite surveillance systems can give real-time information about the location of nuclear forces. All of these developments point to a decrease in the ambiguity about location and warhead effectiveness. Nonetheless, actually getting missiles close enough to deliver their warheads without triggering a nuclear strike poses an entirely different problem.

A New Breed of Weapons

Newly operational HPGMs have two distinguishing elements: accuracy and speed within accuracy. Precision Guided Munitions (PGMs) have existed for decades, but have lacked the speed and range to pose serious counterforce threats. Lieber and Press used a gravity B61 bomb when forming the simulation of a low-casualty counterforce strike (Lieber & Press, 2017, p. 31). Using large bombers to maneuver bombs into hostile airspace directly over targets hardly guarantees that the bombs will ever reach their targets. Additionally, the large time window between launching bombers and current transonic missiles ensures that the leader of a target country has ample time to respond. Traditional ICBMs however have the speed and range, but they lack the accuracy to destroy a hardened target without using a high-yield warhead. Using a high yield warhead will destroy the entire country along with the country's nuclear weapons (Lieber & Press, 2017, p. 31). HPGMs combine the most potent attributes of both ICBMs and sub/trans-sonic PGMs to create a new era of destabilization.

HPGMs fall into three categories: hypersonic cruise missiles (HCMs), hypersonic glide vehicles (HGVs), and hypersonic ballistic missiles (HBMs). Of these categories, hypersonic cruise missiles present the most destabilizing force due to their superior

accuracy, speed, and range relative to their size (Dorn, 2005, p. 13). Hypersonic cruise missiles, with their widely publicized nature, have become the topic of hot debate. On the one hand, the name implies an incredible speed, but the Mach 5 (five times the speed of sound) speed of a hypersonic missile does not compare with the Mach 20 speed of an ICBM (Reny, 2020, p. 52). If hypersonic cruise missiles replace cruise missiles, then the hypersonic variants should still have the accuracy of cruise missiles. Current cruise missiles such as the US-designed Tomahawk can hit targets within the 10-15 meter range that Lieber and Press specified for their tests but not before leaders have the opportunity to react (CSIS Missile Defense Project, 2021). Though the accuracy of many new hypersonic cruise missiles remains classified, one report of the new Chinese DF-17 missile suggests that these new cruise missiles have even greater accuracy than current cruise missiles (CSIS Missile Defense Project, 2021; Sayler, 2022). The accuracy of hypersonic cruise missiles matters much more than the missile defense evasion aspects or the purported stealth capabilities of such weapons. For delivering nuclear strikes, ICBMs already adequately fill the anti-missile defense role and can wipe out a country easily enough without necessarily destroying second-strike capabilities.

Ambiguous Targeting

HPGMs pose a particular threat to stability because of their wide selection of targets and ability to retarget after deployment. While these weapons often serve defensive purposes in the minds of planners and designers, the leaders of countries hostile to the deployers assume the worst-case scenarios. Within the realm targeting three distinct scenarios arise: tactical, strategic counterforce, and strategic nuclear deterrent. Most HPGMs deploy with tactical and strategic nuclear deterrent intentions but can receive new target assignments after deployment and support a different strategy than at deployment (Defense Intelligence Ballistic Missile Analysis Committee, 2017, p. 3). Since HPGMs can receive new target data and have fewer limitations on reach than previous generations of PGMs, the physical limitations which narrowly defined capability cease to create easily distinguishable categories.

Using Jervis's logic of the security dilemma, the retargeting ability of HPGMs presents a seriously destabilizing force in nuclear affairs. Infact, Jervis directly addresses the problem of missile acquisition for nuclear forces in his seminal piece "Cooperation Under the Security Dilemma". Jervis writes that under the security dilemma, in which increases to one state's security come at the cost of another state's security, the dual purpose of ICBMs as anti-city and anti-nuclear weapon missiles hides the strategic

purpose of the weapons. ICBMs however require high yield warheads to compensate for their poor accuracy which leave ICBMs incapable of destroying nuclear weapons without destroying everything around them (Lieber & Press, 2017, p. 32). Jervis on the same page makes a small statement about how strategic planners at the time (1978) viewed then-transonic cruise missiles as potential counterforce weapons (Jervis, 1978, p. 206). If HPGMs directly replace tactical cruise missiles and strategic ballistic missiles, then hypersonic weapons have indistinguishable purposes while increasing the advantages that a first-strike posture affords. The result advances the world towards a "doubly dangerous" (Jervis, 1978, p. 211) strategic environment in which first-strikes can succeed and offensive and defensive missile deployments appear identical.

Regardless of whether a weapon deploys with benign intentions, modern weapons can hit targets of almost any size and type. National leaders then treat these weapons as supporting the worst potential scenario. As Jervis discussed, if a statesman perceives a scenario which threatens catastrophic national losses, then the statesman will react more brashly than normal (Jervis, 1988, p. 697). Thus, regardless of the intent of the weapon initially, the ease of an operator to repurpose an HPGM for a counterforce scenario makes all HPGMs potential counterforce weapons.

An Increasingly Ambiguous Nuclear World

Nuclear theory has thus far focused on discussions of deterrence, MAD, and the preservation of those concepts. Technically, discussions have revolved around the weapons that carry nuclear warheads and their countermeasures. These countermeasures include anti-ballistic missile systems, such as those in the anti-ballistic missile treaty, thus far only cover weapons that allow countries' militaries to respond to a nuclear missile launch (Kimball, 2020). However, since the chance of a nuclear missile launch remains low, the debate about nuclear weapons and their role has largely fallen to the wayside (U.S. Senate, 2023). Nuclear weapons at present lurk in the shadows with no clear indication as to what may trigger their use or when, if ever, they will see use due to their historic non-use.

But these weapons exist. Their existence alone constrains the actions of politicians. Historically the hegemonic competition between the United States and the Union of Soviet Socialist Republics remained cold with the mutual understanding that the loser of a conventional war could initiate a nuclear war. Thus, the Cold War drew to a close with Mikhail Gorbachev and Ronald Reagan famously declaring in 1985 that a

"nuclear war cannot be won and must never be fought" (Ronald Reagan Presidential Library, nd). The sentiment that a major war could bear no fruit pervaded a world in which nuclear deterrence and Mutually Assured Destruction (Fairbanks Jr, 2004) underpinned discussions. But these sentiments have begun to falter as missiles' targets become more ambiguous.

As the world becomes more ambiguous, nations will pursue older and superficially irrational methods of maintaining security. Great powers will increasingly depend on geographic buffers while small nuclear powers will pursue asymmetric conventional counterforce capabilities. Furthermore, The Cold War-era strategy of Arms Control will fail to resolve these conflicts. However, a policy of restraint can abate the threat that HPGMs pose.

Great Power Responses

Despite the implications of more widespread HPGMs, effective mass production HPGMs have yet to enter service. Neither the United States, Russia, China, nor India have created a weapon which could meet the requirements of sustained hypersonic flight and versatility that a cruise-missile style HPGM offers. Yet the destabilizing world has made great powers seek buffers.

When assessing the pursuit of buffers, great powers can fall into two categories: naval powers and land powers. For naval powers, the effects of HPGM proliferation become less pronounced. Yet for land powers, ambiguity leads to attempts to create buffer zones through conquest. Subsequent application of HPGM proliferation to modern territorial disputes can therefore make superficially irrational conquests rational.

The definition of a great power remains open to debate, but generally a state with a military, economy, and general level of influence greater than the rest of the states within the international system can offer a working definition. Russia, China, and the United States today constitute the three great powers within the international system according to the congressional report service (Congressional Research Services, 2023, p. 1). Debates persist about whether the United States still has the status of hegemon or unipole, or whether Russia should continue to count as a great power. Indeed, the U.S. chairman of the Joint Chiefs of Staff has labeled China as the "pacing challenge" of the United States in reflecting the diminished status of Russia as a rival great power (Garamone, 2021). Despite the decline of Russia from the days of the Soviet Union, the Russian Federation persists as a major international competitor as the invasion of Ukraine shows.

Within the context of land powers, buffer states have traditionally restricted the movement of armies. The logic goes that if a large geographical buffer separates two warring states, then the additional time and complexity of moving an army decreases the effectiveness of military maneuvers (Atzili & Kim, 2023, p. 650). Yet with advances in military technology, an argument has arisen that buffer states have become much less effective than in the past.

Buffers have not become less effective though. Critics of buffer zones argue that since missiles and aircraft traverse the air at great speeds, the ground beneath them matters less than in the times of grand armies (Atzili & Kim, 2023, p. 653). But the physical territory has never had greater relevance than today. First, aircraft and missiles must require runways and launchers. Those ground-based assets then need territory to stage on. Throughout the debates of airpower and missiles ground has received surprisingly little attention despite the fact that nothing remains permanently airborne.

For airborne weapons, the distance they travel directly affects the time they need to reach their targets. A missile battery on the border between two warring countries can launch a missile that takes less time to reach a target than a missile from a battery far from the border. In a simple distance - rate - time calculation, a leader who wishes to buy more time and who cannot control the speed of a missile will increase the distance from the missile to the missile's probable targets.

Regarding specific great land powers, Russia currently stands alone. India has risen in economic strength but the Indian military has yet to become a major international force (Allison, 2023, p. 3). Thus India will still count as a minor power, even if a relatively strong one. Russia's status as a land power derives from Russia's military orientation towards the continental powers of Europe and Central Asia. Russia prioritizes the army, then the navy, and then the air force in spending (Crane, Oliker, & Nichiporuk, 2019). Russia's relative strength enables Russia to pursue the creation of a buffer whereas weaker states cannot easily create buffers.

Advances in missile technology have at least partially motivated Russian leaders to pursue a substantial geographical buffer. The apprehension over missile advances becomes evident in the withdrawal of both the U.S. and Russia from the Intermediate-range Nuclear Forces (INF) treaty in 2019. Russian President Vladimir Putin cited the development of a ground-launched variant of the tomahawk cruise missile as grounds for his withdrawal of Russia from the treaty (Bodner, 2019). A couple years later, in the critical diplomatic phase before the Russian invasion of Ukraine, Putin referenced

hypersonic cruise missiles in Ukraine as unacceptable (Soldatkin & Osborn, 2021). In all of his arguments, Putin cites reduction in time to target as the main threat that closer missile batteries to Russia pose.

While the United States never officially announced the movement of batteries into Ukraine, the ambiguity between strategic and tactical weapons had grown substantially. The United States military deemed the modified Mk-41 Vertical Launch Systems in Poland incompatible with Tomahawk cruise missiles (Korda & Kristensen, 2019, p. 302). In considering that distinction adequate and the Russian response an overreaction, the United States clearly failed to recognize the impact of growing target ambiguity. Much as in the prisoner's dilemma, Russian leaders cannot take a chance on ambiguous weapons. If these launchers could launch tomahawk cruise missiles and successor hypersonic cruise missiles, then they could do as much damage to frontline supply depots as to Russian nuclear forces. Thus, the Russian leadership will seek to increase the physical distance between potential missile launch sites and Russian nuclear missiles.

For naval powers the necessity of buffers remains but becomes less acute. By their nature, naval powers already possess oceans as buffers. Nonetheless, the two major naval powers, China and the United States, have sizable land buffers which follow the logic of the land power buffers when encountering target ambiguity. The ambiguity for these countries will however become worse as the conventional prompt global strike program matures.

The Chinese military will react more aggressively to missile batteries on islands in the South Pacific as target ambiguity continues to grow. Thus far, China has maintained a relatively passive posture regarding nuclear forces. The Chinese military has long sought to use nuclear weapons as a form of deterrence against nuclear blackmail, going back to the experience of the Korean war (Denmark & Talmadge, 2019, p. 3). The recent construction of additional nuclear missile silos and strengthening of the Chinese nuclear triad has subsequently sparked fears of increasing Chinese aggression (Copp & Baldor, 2022). Yet the Chinese government maintains the country’s nuclear no first-use pledge. The nuclear buildup then clearly represents a response to the deterioration of strategic stability.

E-ISSN: 2798-4427
DOI: 10.36859/jgss.v3i2.1773

Minor Nuclear Powers

The United States and Russia both developed nuclear arsenals at the beginning of the Cold War with one another in their sights. These two nations have subsequently remained the center of the nuclear debate, especially since the United States and Russia have 90% of the world's nuclear stockpile with ~6000 warheads each (Davenport, 2022). Such large stockpiles have given the United States and Russia highly resilient nuclear forces, since any decapitating counterforce strike must destroy the vast majority of these weapons to prevent retaliation. Further, the United States and Russia enjoy superb geographic boundaries with the US possessing two ocean barriers and Russia the vastness of the Siberian tundra. For the rest of the nuclear community, the safety of massive stockpiles does not exist. States with small nuclear stockpiles have a higher chance of becoming counterforce targets simply because a completely effective strike has a higher chance of occurring against smaller nuclear stockpiles.

Real-time information does not matter as much for China, the US, or Russia as all three can develop reliable defenses against one another's surveillance assets (Lieber & Press, 2017, pp. 46-47). For smaller countries, the effects become much more profound. India, Israel, Iran, and Pakistan for example do not have anywhere near the surveillance capabilities that the US, China, and Russia have. However, all four have alliances of some kind with these three superpowers. More importantly, while most physical forces take a long time to stage for any kind of operation, satellites can survey points all across the globe, and airborne systems can travel long distances in short periods of time.

Even with advancements in technology, the chance of a nation conducting a counterforce strike remains low. Within that small chance of counterforce strikes occurring, India and Israel have greater incentives to conduct strikes and higher chances of succeeding than their fellow nuclear-armed nations. Israel sits close to Iran, which has come close to acquiring nuclear weapons in recent years and which Israel has vowed to thwart. India sits next to Pakistan, both countries have nuclear weapons, and both country's militaries have fought several conventional wars after developing nuclear weapons. Israel has a close military relation with the United States, Iran with Russia, Pakistan with China, and India possessing a somewhat neutral stance though having good relations with Russia and the US.

India and Pakistan both have around 160 nuclear warheads each making their arsenals much smaller than those of Russia and the US (Davenport, 2022). India has already begun considering counterforce options especially given the incredibly fraught relation that India and Pakistan have. Pakistan has made threats of first-use nuclear

strikes against Indian forces which have motivated Indian military planners to develop contingency plans (Clary & Narang, 2018). India possesses a superior conventional military force to Pakistan's and has a much larger population and economy, all of which substantially improve India's odds of winning a conventional war against Pakistan. If using US surveillance assets, India could conceivably use precision missile attacks to destroy Pakistan's nuclear weapons and crush Pakistan's smaller military, ending decades of conflict.

Israeli leaders have adopted a stance of never allowing Iran to acquire nuclear weapons which indicates a potential interest in counterforce strikes. Israel and Iran have had an incredibly tenuous and widely-publicized relationship going back to Israel's founding in the 1940s. Iranian leaders have threatened to destroy Israel and Israel to crush Iran's nuclear program (Nader, 2013, p. 21). The Israeli leadership clearly sees Iranian nuclear weapons as a threat and shares these views with the United States as the U.S. sanctions policy towards Iran indicates (Robinson, 2022). Using advanced surveillance assets, the U.S. could monitor the locations of Iranian nuclear weapons with great effectiveness since capable surveillance assets already exist in contrast to the mid-Cold War Pakistan and India case. Destroying Iranian nuclear weapons before they appear in large numbers presents an attractive option given the harsh Israeli rhetoric about Iranian nuclear acquisitions.

A new era of counterforce has arrived. Counterforce strikes in past decades could occur, but not without using a massive nuclear strike that bore little difference from a devastating nuclear attack against population centers. Major advances in surveillance and accuracy have enabled military planners to seriously consider decapitating strikes against adversaries' nuclear arsenals. While for nations with thousands of nuclear weapons such as the United States and Russia the effects of such a transformation bear little consequence, the effects become more important for smaller regional rivals such as Pakistan and India. The question of whether a nation will launch a nuclear attack in response to a debilitating strike, if the target nation even has the capability afterward, gives maneuvering room to planners of a counterforce strike. In the future, states such as Israel may use counterforce strikes against emerging nuclear powers such as Iran in order to prevent rivals from acquiring robust nuclear arsenals. Nations that already have nuclear weapons but do not have stockpiles on par with the US and Russia, such as India, will consider increasing the sizes of their arsenals to improve their survivability in the event of a counterforce strike.

E-ISSN: 2798-4427
DOI: 10.36859/jgss.v3i2.1773

Mitigating Target Ambiguity

In order to mitigate target ambiguity, countries must pursue policies of restraint. Arms control will not work for the simple reason that countries tend to follow arms control regulations with such powerful weapons only when convenient. The complete collapse of the Cold-War and immediate post-war treaties offer the best evidence for why arms control won't work. Furthermore, as previously discussed, complete withdrawal or overextension of military forces will do little to mitigate ambiguity.

Nuclear arms control has seen a massive backslide over the last couple of decades. In February of 2023, Russian president Vladimir Putin announced the suspension of the New START treaty, the last nuclear arms control treaty between the United States and Russia (Bugos, 2023). The suspension of the treaty follows the collapse of the Intermediate Range Ballistic Missile treaty. The collapse of the IRBM treaty occurred only a year after Russia announced the successful test of a nuclear-powered cruise missile (Gady, 2018). Two weeks after the collapse, the United States tested a ground-launched Tomahawk cruise missile (Korda & Kristensen, 2019, p. 302). With these two developments, both countries clearly began deploying new technology which had both tactical and strategic uses.

The growing ambiguity in target selections makes limiting strategic weapons more difficult because military leaders will observe a limitation of tactical capabilities. With China, Russia, and the United States entering a more unstable world, tactical weapons will become more attractive. Hence the creation of the CPGS program in the first place. Any arms control treaties that arise will almost certainly govern unambiguous strategic weapons or weapons which have yet to become feasible.

Maintaining a posture of restraint however will substantially mitigate the worst effects of target ambiguity. Using the United States as an example, keeping forces in Japan and Germany/Poland but giving Russia a buffer and China an island buffer will keep tensions low. The need for HPGMs will decrease and no imminent risk of a short-range hypersonic missile attack will exist. For smaller countries, keeping U.S. forces back will reduce the risk that a smaller country will launch a counterforce strike that a broader coalition can exploit.

The American political theory of retrenchment best illustrates how adopting a secluded international strategic position can incentivize the development of wildly destabilizing weapons and make such a posture, ironically, threatening. The theory of retrenchment promises a more stable world through the removal of forward American

forces abroad. The arguments in favor of retrenchment often point to America's geographical position for evidence of inherent American security. The wide oceans on either side of America create effective buffers against any adversary's attempt to invade. Furthermore, the weak neighbors to the North and South of the United States pose little threat of invasion. Beyond the risk of invasion, America's nuclear arsenal guarantees protection from any massive strategic attack (Posen, 2013). These conditions then create the basis for putting more pressure on allies to contribute to their own defenses and thus alleviate some of the economic burden of defense that the United States bears.

These arguments closely follow the older isolationist discourse that pervaded America in the 19th and early 20th centuries. Critics usually cite the effects of reduced deterrent capabilities, less assurement for allies, and a reduced reaction time for international crises (Lieberman & Kyl, 2013). Yet the U.S. withdrawal from Afghanistan has indicated a shift towards constraining American involvement abroad. If calls for withdrawal increase, then demand for budget cuts will follow.

Yet the issue of how to actually implement retrenchment has led to a division between isolationism and what Professors Mearsheimer and Walt call "Offshore Balancing". Under Offshore Balancing, the United States moves military forces only to regions where a regional hegemon has begun to grow. Mearsheimer and Walt believe that the time a regional hegemon needs to grow translates to ample warning of said hegemon's rise (Mearsheimer & Walt, 2016). While cost reduction serves as the ultimate goal, transporting troops and equipment to a continent in response to a threat requires additional funds. If the United States could avoid having to move massive amounts of equipment and material entirely, then military costs could fall substantially.

With these elements in mind, the appeal of the Conventional Global Prompt Strike (CGPS) program grows ever greater. The basic premise of the program, to create a set of HPGMs which can deliver conventional warheads from the U.S. mainland to any target in the world in under an hour, promises to fix the problems of retrenchment (Congressional Research Services, 2021, p. 1). For the critics of retrenchment, the program offers a solution to reduced global deterrence. The ability to threaten a massive conventional missile strike that launches from the U.S. mainland differs little from the same threat but from forward bases, on paper at least. Former U.S. President Barack Obama expressed the exact same beliefs when he described how the program could provide regional deterrence (Congressional Research Services, 2021, p. 1). In fact, current congressional support for the program has derived from the U.S. reducing the footprint of overseas conventional forces (Congressional Research Services, 2021, p. 3).

Building up HPGMs takes place at the U.S. mainland and during times of peace as opposed to close to an adversary and during times of high tension. Additionally, conventional precision weapons have the unique ability to hit any target as opposed to a nuclear ICBM's fixed target coordinates. On top of the variable targeting of the missiles, a large number of missiles launching from the U.S. mainland can mirror a nuclear missile strike and trigger an accidental retaliation.

However, assuming a high threshold for triggering a nuclear retaliation, conventional responses become more probable. For a foreign leader gauging the buildup of the U.S GSW arsenal, the target of a strike from the arsenal will remain ambiguous. The ambiguity may then increase the probability of war, or at a minimum strikes against, a retrenched United States.

Countries' leaders who move in a similar direction as retrenchment or which seek to leave an entrenched position will face similar temptations to develop GSWs. In the coming world, isolated powers will become less removed and will pose as great a threat as expansive militaries once did.

The latest round of arms races has begun destabilizing the world. In contrast to past decades however, the ambiguity of the target selection for these new sets of weapons drives the instability. Including the ambiguity of modern HPGMs in strategic planning can explain why states today take actions that their leaders consider defensive and opposing leaders offensive. Addressing the new era of ambiguity will require restraint on the part of policy-makers around the world and avoidance of extreme force restructuring.

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E-ISSN: 2798-4427
DOI: 10.36859/jgss.v3i2.1773

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