The Threat of Conventional Weapons to Nuclear Security: A New Reality for Deterrence

Peter James Mckenzie Rautenbach

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ABSTRACT

This paper explores the idea that developments in Conventional Prompt Global Strike (CPGS) systems degrade nuclear security. The United States is developing such weapons for niche conventional use on the surface, but the line between tactical and strategic weapons is becoming blurred. What is more, while there have been discussions in Congress surrounding the problem of missile ambiguity, there is a multitude of other problems, with the largest being that CPGS weapons inherently degrade nuclear security. By looking at the behavior of critical states and actors involved in the emergence of CPGS weapons and combining this with pre-existing literature and insight on similar topics within international relations, we then can conduct a thorough investigation on the impact of these CPGA systems. When compared to nuclear missiles, the increasing usability of these weapons is inherently dangerous, as it increases both the likelihood of their use and the likelihood of a first strike against another state's nuclear deterrent. Traditionally, conducting a first strike has been all but impossible because it entailed using nuclear weapons, which come with ethical and environmental consequences. If nuclear weapons can be replaced or substituted with CPGS weapons, then a first strike becomes an actual possibility. Hence, as a result, the nuclear doctrine is changing to reflect this conventional danger and has led to a lower threshold for nuclear use. This fact then demonstrates clear signs that CPGS technology degrades nuclear security and thus increases the chance of nuclear use.

KEYWORDS

BSU, deterrence, nuclear weapons, first strike, conventional weapons, emerging technologies

Introduction

Nuclear weapons hold a unique place in arms control and international relations. In one sense, they viewed are still as one of the greatest threats to humanity – desp ite the fact that 75 have passed since they were last used. On the other hand, they seem to have been largely relegated to the sidelines of the public sphere since the end of the Cold War. A bogyman from a bygone age whose danger is remembered but not truly felt anymore. Recent developments involving North Korea aside,[1] new threats such as terrorism, cyber warfare, and the continuing evolution of conventional weapons have taken the spotlight. The lethality of nuclear weapons remains unchanged, but public and government focus has arguably shifted to face new threats.

However, it is precisely these non-nuclear developments that merit a review of nuclear stability, as they themselves threaten the regimes that were set in place to control nuclear proliferation. In particular, the evolution of conventional capabilities surrounding global strike programs generally referred to as Conventional Prompt Global Strike (CPGS) systems in the United States. These developments threaten to degrade nuclear security and subsequently increase the danger of nuclear use. We are talking primarily here about the increasing accuracy of missiles at the intercontinental level. Increasing the accuracy of a missile means that the yield of the warhead can be lowered and a conventional weapon can theoretically be used instead of a nuclear one in roles traditionally filled by the latter, such as a disarming first strike. While seemingly positive, this development undermines nuclear security by making a first strike a real possibility, which in turn raises the chances of a nuclear response.

Additionally, the increasing viability of conventional weapons with intercontinental range raises a myriad of other questions and concerns. The issue that has drawn perhaps the most attention here is the inherent ambiguity of missiles inflight. After launch, missiles carrying conventional warheads are indistinguishable from those carrying nuclear warheads. This in turn increases the likelihood of one of these weapons being mistaken for an incoming nuclear missile. In Congress, debates surrounding long-range conventional weapons have often focused too narrowly on the issue of miscalculation, and serious concerns have been raided regarding misattribution.[2] To this end, hypersonic weapons systems are being explored as alternate delivery systems because their flight path is distinctly different from that of ballistic nuclear weapons.[3] However, despite the differences in their flightpaths, hypersonic weapons have the same problem as ballistic missiles in that there is nothing preventing nuclear weapons from being loaded onto these systems. Looking deeper into the ramifications of these developments on nuclear deterrence, it becomes clear that not only does the use of hypersonic delivery systems fail to solve the problem of misattribution, but that CPGS weapons, no matter how they are deployed, inherently degrade nuclear security and consequently increase the chances of nuclear use regardless of the launch system used.

1 Choe Sang-Hun, "North Korea Vows to Boost Nuclear Program, Saying U.S. Diplomacy Failed," The New York Times, June 2020, accessed January 29, 2021, https://www.nytimes.com/2020/06/11/world/asia/north-korea-nuclear-trump.html.
2 Acton 2013, 1, 4.
3 Butt 2016, 51.

Background Definitions

The central argument here is that contemporary developments in conventional weapons technology degrade nuclear security, and that this in turn warrants conventional arms control efforts. However, this is not a technical paper and it does not provide technical answers to the problems explored here. The focus is on the wider political and security challenges posed by the development of conventional weapons technologies. This focus on technology posits that, regardless of the state involved, it is technology itself that poses the threat. Consequently, the emphasis here is not on individual states as causal factors behind the danger. Nonetheless, there is a specific focus on the United States due to its consistent and open desire to develop a global strike program using conventional weapons with intercontinental range.[1] We will also discuss the responses of Russia and China to U.S. conventional weapons development, as they are both nuclear states that are arguably adversaries of the United States. It is within these two bilateral relationships that the impact of evolving conventional weapons technologies can be clearly seen. That notwithstanding, it is the strategic impact of these weapons that poses a threat to international stability.

However, as M.C. Horowitz points out, the very fact that this technology is still emerging makes studying its potential impact difficult.[2] This is largely because of the lack of available evidence and the fact that there is real uncertainty surrounding the influence of new technologies.[3] This uncertainly is of course why the topic merits academic exploration and why this paper discusses the danger of CPGS weapons, despite the lack of empirical evidence. Horowitz puts forth that there are research design options available when studying new weapons technologies, as well as a lack of data. One of the more relevant options he presents "involves behavioral research on what influences attitudes toward them within the general public [...] in the military, or among elites."[4] The other relevant approach for this paper involves studying applied theory, which "entails leveraging insights from existing international relations theory – or other fields – and applying them to limited existing evidence to assess how particular weapons systems are likely to shape international politics."[5] Despite the inherent methodological shortcomings of studying the impact of emerging technologies, these two methods allow us to explore existing theories and cross-reference them with the real world actions of military leaders and planners in order to make logical claims about the strategic influence that developments in conventional weapons technology have on international security and stability.

On that note, conventional weapons can be generally understood to be any weapon that derives its destructive power from kinetic energy, or standard explosives. For this discussion, this can be narrowed down to focus on CPGS weapons which are "high-precision conventional weapons capable of striking a target anywhere in the world within one hour's time of the decision to launch."[6] This paper will delve

1 Warren 2011, 446; Butt 2016, 51.
2 Horowitz 2020, 386.
3 Ibid.
4 Ibid., 387.
5 Ibid.
6 Acton 2013, 4.

into the strategic ramifications that inherently come with CPGS weapons; however, it should be noted that many of these weapons also incorporate another emerging technology known as hypersonic launch systems. The inherent instability caused by CPGS weapons is separate from hypersonic technology. However, because the U.S. development of CPGS is increasingly focused on hypersonic variants,[1] this emerging technology warrants an exploration in the context of CPGS weapons. Furthermore, as will be discussed shortly, the U.S. Congress believes that pursing hypersonic variants of CPGS weapons gets around the problem of warhead attribution that comes with the use of conventional missiles.[2]

Hypersonic Weapons and Warhead Ambiguity

At their core, hypersonic weapons are those that "travel faster than Mach 5 (~3,800 mph) and have the capability to maneuver during the entire flight."[3] Both factors theoretically increase the survivability of a hypersonic missile against ballistic missile defense (BMD) systems as "the flight profile of [hypersonic weapons] provides a natural immunity from U.S. ballistic missile defenses."[4] These advantages could allow for maneuverable lightning-fast strikes against adversaries, which is why many states are pursuing this technology. On the surface, developing flexible non-nuclear options appears to be a step in the right direction. In an escalating crisis where some level of nuclear conflict seems inevitable, the option to use CPGS weapons in the place of a nuclear strike appears to be not only desirable, but also the distinctly ethical choice. However, while this flexibility is beneficial to any state, the very existence of these weapons destabilizes nuclear deterrence and international stability, and even increases the odds of nuclear use.

As we stated earlier, the debate surrounding CPGS has been narrowly focused on the issue of warhead ambiguity.[5] However, accurate long-range conventional weapons are inherently dangerous, and this is separate from any ambiguity issues. Despite this danger, it appears that the United States will continue to pursue CPGS weapons, due in part to the belief that hypersonic delivery systems offer an escape from the problem of warhead ambiguity. While it could be argued that a working and unambiguous CPGS system would outweigh the inherent degradation of nuclear deterrence that comes with it, the reality is that hypersonic missiles are not free from the same ambiguity problem. Traditionally, ballistic CPGS systems could easily be misinterpreted as a nuclear attack, "thereby fostering unwanted and strong escalatory incentives."[6] This is because of the "virtually impossibility of knowing the difference between a nuclear and conventionally armed missile" once in flight.[7] This difficulty stems from the fact "that the ballistic trajectory of [conventionally-armed ballistic missiles] makes it undistinguishable from a nuclear-armed ballistic missile."[8] With this difficulty in mind, hypersonic weapons could theoretically act as an unambiguous

1 Butt 2016, 51.
2 Ibid.
3 "Hypersonic Weapons Basics," Missile Defense Advocacy Alliance, accessed January 29, 2021, https://missiledefenseadvocacy.org/missile-threat-and-proliferation/missile-basics/hypersonic-missiles/.
4 Butt 2016, 52.
5 Acton 2013, 4.
6 Gromley 2015, 125.
7 Ibid.
8 Garcia 2017, 359.

global strike system – as the boost-glide trajectory of hypersonic weapons, which differs from a traditional ballistic missile. This would make them less likely to be confused with a nuclear ICBM attack.[1] However, while the United States allegedly intends for hypersonic weapons to remain within the conventional realm, both Russia and China appear to be pursing nuclear variants.[2] Despite assurances by the United States that it will not arm its hypersonic weapons with nuclear warheads, adversarial states have to see incoming hypersonic weapons as a possible nuclear attack. This then puts hypersonic missiles in the same ambiguous category as ballistic missiles. Therefore, regardless of whether we are talking about conventional ballistic or hypersonic missiles, their use could be misinterpreted as an incoming nuclear strike. However, suppose one is to argue that Congress has been focusing too narrowly on the issue of warhead ambiguity. In that case, one must also establish the alternative problem of CPGS weapons that they should be focusing on. By exploring core theories of nuclear deterrence and the strategic impact of CPGS weapons, their degrative effect on the key tenets of nuclear security becomes clear.

Deterrence Theory

One such tenet under threat is Mutually Assured Destruction (MAD). Despite the unquestionable danger of nuclear weapons, many, including the late K. Waltz, argued that they "are a great force for peace."[3] The cold, yet effective logic of this idea is that nuclear states can never afford to go to war with one another because the possible retaliation would be too costly. The key concept here is the absolute certainty nuclear weapons create, as their use would be undeniably catastrophic in every way imaginable. Therefore, states tend to act defensively rather than offensively as "the state that fears attack does not pre-empt – since that would be a wasteful [and dangerous] use of its military resources – but rather prepares to receive an attack. Doing so does not decrease the security of others, and several states can do it simultaneously; the situation will therefore be stable."[4] In theory, nuclear weapons become the ultimate defensive tool. In this way, the theory of MAD has a strong parsimony. However, this is not to say that MAD is an unassailable concept that is destined to remain static. In fact, as stated by B.R. Green and A. Long, MAD is far "more malleable then commonly admitted."[5] While the destructive nature of nuclear weapons is irrefutable, the survivability of a state's second-strike or retaliatory capability is not secure. B.R. Green and A. Long saw that Soviet nuclear policy changed throughout the Cold War as its leadership became increasingly concerned that their deterrent was becoming less effective and thus vulnerable to an American disarming strike.[6] To take this one step further, K.A. Lieber and D.G. Press suggest that developments in ballistic missile accuracy was, and continues to be, a threat to the survivability of fixed targets and thus places doubt on the strength

1 Butt 2016, 51.
2 Ibid.
3 Van Evera 2013, 241.
4 Jervis 1978, 190.
5 Green, Long 2017, 606.
6 Ibid., 608.

of MAD.[1] This paper seeks to build upon these ideas, which, when thoroughly explored, will demonstrate that the stability of MAD eroding due to the continued pursuit of conventional strike weapons, and that new developments in missile accuracy are a large part of this problem.

It can be argued that stability in nuclear security is primarily based on perception and the confidence in one's second-strike capabilities. The perception of a threat can have almost the same effect on states as real threats, especially when it comes to nuclear strategy. Additionally, failing to correctly perceive an adversary's deterrent, or misunderstanding how one's own deterrent is perceived, can cause a complete failure of deterrence efforts.[2] R.K. Betts notes that states could "stumble into [war] out of misperception, miscalculation and fear of losing if they fail to strike first."[3] Furthermore, threat perception guides nuclear doctrine because there would be almost no time to consider real world developments in a situation where nuclear weapons are used. If nuclear weapons are launched, there could be as little as 15–30 minutes before they reach their target.[4] Therefore, states build their nuclear doctrines around what they perceive as threats, rather than around actions directly taken against them.

One core aspect of perception is the idea of an offensive or defensive advantage. The principal idea is whether being aggressive or defensive is advantageous to obtaining security for the state. When offense is said to have the advantage, it is easier to destroy the forces of an adversary and take territory than it is to defend your own. The opposite is true when defense has the advantage. Moving forward and capturing territory becomes less efficient than defending your own.[5] In the defensive world, military buildup by states can be assumed, at least to some degree, to be defensive, as aggression is impractical. Thus, states can increase their own security without threatening the security of others due to the perception of the threat being lowered.

With this in mind, for most of world history, defense has arguably had the advantage.[6] Attacking has been costly, as technology and geography often made it possible to absorb aggression.[7] However, despite this apparent defensive advantage, human history is littered with wars. As mentioned before, perception plays an important role in strategy. Even in a defensive world, if conquest is believed to be easy, or at the very least possible, then states will act accordingly.[8] However, as Betts said, "easy" maybe be too vague an adjective and therefore it should be replaced with "when states believe that conquest of a desired objective is achievable at acceptable cost."[9] Additionally, while the perception of an offensive or defensive advantage is especially pertinent to the potential outbreak of a nuclear conflict, the causes of conflict are undeniably varied. The focus on perception in nuclear deterrence is arguably due to the realist notion of the rational actor.

While the notion of rationality is certainly up for debate, the undeniable destruction of nuclear weapons once again comes into play here and forces states and

1 Lieber, Press 2006, 34.
2 Jervis 1982, 3.
3 Richard K. Betts, "Realism Is an Attitude, not a Doctrine," The National Interest, August 2015, accessed January 29, 2021, https://nationalinterest.org/feature/realism-attitude-not-doctrine-13659.
4 Blair 2020, 18.
5 Jervis 1978, 187.
6 Ibid., 213.
7 Ibid.
8 Van Evera 2013, 117.
9 Betts 1999, 169.

leaders to consider the impact of their use no matter their motivations for aggression. Despite valid critiques of Offense–Defense Theory, when it comes to non-nuclear powers, the theory helps understand how modern great powers act.[1] These weapons force actors to be rational, as defined by R. Keohane, and to consider the consequenc es of aggression. Here, states are: unitary rational actors, carefully calculating costs of alternatives courses of action and seeking to maximize their expected utility, although doing so under the conditions of uncertainty and without necessarily having sufficient information about alternatives or resources to conduct a full review of all possible courses of action.[2]

Even if the factors that drive them to act aggressively fall outside traditional realist thinking, the threat of a second strike cannot be ignored. Planned aggression, in the form a first strike between nuclear armed states, would arguably only occur if one side doubted the resolve of the other to use their nuclear deterrent, or if they believed that they could somehow avoid being hit by a second strike. In either case, it could be said that offensive would have the advantage.

Offense is far more difficult if one's weapons are secure. Nuclear weapons are a powerful deterrent due to their assured level of destruction, but only if they can be relied upon. Therefore, any development that threatens the reliability of nuclear weapons could result in a shift to an offensive focused world and this is precisely what CPGS programs are doing. They have the potential to render the deterrent capability of states such as Russia and China ineffective, thus promoting the possibility of a first strike by the United States. The mutually assured aspects of MAD are removed, and destruction is all that remains.

Given that the perception of whether or not offensive actions have the advantage is a key factor in nuclear decision making, this allows us to put forward a definition of nuclear stability. Nuclear stability is evident when states perceive/believe that adversaries are unlikely to conduct a preemptive strike against their nuclear deterrent. This perception of safety can be created by a multitude of different factors, one being technical limitations on first-strike capabilities. If conducting a first strike is extremely difficult, then states are naturally less likely to perceive such a risk. Stability would thus increase, as the fear of being attacked is reduced. On the other hand, nuclear stability is often influenced by soft power, in the form of arms control agreements. These confidence- and security-building measures often allow for "information exchanges, means for compliance and verification, as well as different forms of military co-operation."[3] Taken together, the concepts that define stability help to provide a framework for exploring the detrimental effects of the development of conventional weapons.

The Dangers of Technological Developments in Weapon Accuracy

Traditionally, the less accurate missiles are, the more powerful they need to be to achieve their objective. A direct hit may not be possible, but this can be accommodated for with a larger payload or by launching more missiles. It is

1 Betts 1999, 168.
2 Keohane1986, 164.
3 "Arms Control," Organization for Security and Co-operation in Europe, accessed January 29, 2021, https://www.osce.org/.

important to remember that first-strike targets are often incredibly far away from launchers and may be hidden or moving. With this in mind, a nuclear silo can withstand at least 10,000 pounds per square inch or more of blast pressure on the ground, so the strike must be able to produce this amount.[1]

However, as accuracy increases, fewer launches and smaller payloads will theoretically be required to achieve a successfully first strike on an adversary. The potential reduction of the payload yield is what turns this into a discussion about developments in conventional weapons technology. A missile targeting a nuclear silo could theoretically be armed with a conventional payload if confidence in the missile's accuracy was great enough. To that end, modern developments in missile accuracy seems to indicate that this level of confidence may be a realistic possibility. One of the more "promising [approaches] to boosting accuracy is the addition of a Global Position System (GPS) receiver."[2] Ballistic missiles within the United States have traditionally relied on inertial navigation, and while this is accurate enough for nuclear weapons with their larger yield, it would not be enough for conventional weapons.[3]

Another development in accuracy is super-fuze technology. The super-fuze increases the effective accuracy of ballistic missiles by giving them a "flexible height-of-burst capability that enables [them] to detonate at any height within the lethal volume over a target."[4] Thus, weapons, warheads and missiles that would have overshot their objective can now be detonated anywhere above their target, close enough to ensure a successful strike. Before the addition of the super-fuze, only half of the U.S. Trident II 100-kt W76-1 ballistic missile warheads would have hit their target with enough force to take out a nuclear silo.[5] While technically not increasing the actual accuracy of the missile, the super-fuze technology increases the ability for weapons to strike their targets with lethal force. Despite its potential, the creation of super-fuze technology should not be viewed as a single moment in time that signifies the advent of useable CPGS weapons. It should instead be seen as part of an overarching push or movement toward the development of long-range conventional weapons that can be used in a counterforce or disarming first strike. Both the addition of GPS systems to conventional weapons and the creation of super-fuze systems effectively increase accuracy, and they indicate that CPGS are becoming increasingly viable tools.

This technological advancement degrades nuclear security because conventional missiles are more useable than nuclear missiles and because this increased viability will further exasperate the pre-existing ambiguity of missile launches. In theory, a state could achieve total victory over another nuclear state by conducting a first strike on its nuclear deterrent. If successful, this preemptive actor would avoid suffering the ramifications of MAD. However, as long as strategic nuclear weapons are used to conduct the first strike, a preemptive nuclear attack has never been a realistic option. This lack of realism is due to the devastation that would be inflicted

1 Han M. Kristensen, Matthew McKinzie, and Theodore A. Postol, "How U.S. Nuclear Force Modernization is Undermining Strategic Stability: the Burst-Height Compensating Super-Fuze," Bulletin of the Atomic Scientists, accessed January 29, 2021, http://thebulletin.org/how-us-nuclear-force-modernization-undermining-strategic-stability-burst-height-compensating-super10578.
2 Acton 2013, 60.
3 Ibid.
4 Han M. Kristensen, Matthew McKinzie, and Theodore A. Postol, "How U.S. Nuclear Force Modernization is Undermining Strategic Stability: the Burst-Height Compensating Super-Fuze."
5 Ibid.

on the global environmental. For example, even a "nuclear war between new nuclear states, say India and Pakistan, using much less than 1% of the current global arsenal, could produce so much smoke that [...] it could produce global environmental change unprecedented in recorded human history."[1] Considering that the three large powers discussed in this paper have approximately 5,800 (in the case of the United States),[2] 6,370 (Russia),[3] and 290 (China)[4] nuclear warheads, respectively, a first strike to eliminate any one of these state's nuclear arsenals, particularly those of the United States or Russia, would have to be large enough that mutually assured destruction would be almost inevitable without a second strike even being launched. It is far more likely that, alongside the potential environmental devastation of a first strike, part of the deterrent would survive and then be used on the aggressor's cities. Bismarck's observation that a preemptive strike was akin to committing suicide out of a fear of death has never held more relevance than with nuclear weapons. This fact alone, barring all others, should be enough to prevent a disarming first strike.

However, this changes as soon as states develop the ability to use nuclear weapons with conventional warheads. These weapons are "useable" in the sense that they lack the well-deserved stigma that comes with strategic nuclear weapons. For example, when considering a first strike on China, even if the targets are too hardened for current conventional capabilities, a combination strike that uses low-yield nuclear warheads alongside conventional weapons could result in a successful first strike and as few as 700 casualties in total.[5] This circumvents the taboo of nuclear genocide and makes for a much more attractive prospect, which again degrades nuclear deterrence.[6] Without both the psychological effect of nuclear weapons and the very real environmental devastation that would occur with nuclear use, a first strike on an adversary becomes an actual possibility.

This should not be taken as the belief that this technology will drastically change the face of war or guarantee the use of nuclear weapons. Some thinkers have rightly pointed out that discussions on emerging technologies often amount to a dangerous form of alarmism.[7] Historically, other technologies, such as chemical weapons, which were predicted to change the nature of warfare failed to live up to these expectations.[8] Other times, "even when technologies do have significant strategic consequences, they often take decades to emerge, as the invention of airplanes and tanks illustrates."[9] The notable exception to this was the advent of nuclear weapons. The undeniability of their sheer destructive power has dominated international security and great power interactions since their conception. CPGS weapons are not nuclear weapons, nor will they come close to reshaping the very nature of war. Where they differ from other once emerging technologies is that while they too will not come close to restricting conflict, they may directly impact how nuclear deterrence and

1 Robock 2010, 419.
2 Kristensen, Korda 2020b, 47.
3 Kristensen, Korda 2020a, 103.
4 Kristensen, Korda 2019, 172.
5 Christensen 2012, 462.
6 Woolf 2013, 7.
7 Sechser 2019, 728.
8 Ibid., 729.
9 Ibid.

nuclear strategy function. The importance of studying these weapons comes from their secondary effects. Their danger lies in the instability they create with regard to nuclear weapons.

Having a useable first-strike weapon increases international instability in a multitude of ways. A state with realistic first-strike capabilities can adopt a much more aggressive foreign policy. Such a policy could lead that state to overconfidently conduct a first strike using CPGS weapons, only to trigger a nuclear response when they almost certainly fail to completely eliminate the adversary's nuclear deterrent. Additionally, a realistic first strike further degrades nuclear stability because other nations tend to lower their own nuclear threshold for nuclear use or adopt more aggressive postures to deter a conventional first strike. Due to the offensive advantage that comes with CPGS programs, other states can be backed into a corner, which could lead them to lash out and fight even if they are at a disadvantage. This offensive domination thus makes war more likely. Instability will occur no matter who has the offensive advantage, as states will struggle to escape this utterly disadvantageous situation – and struggle can hold the seeds of war.[1]

A distinct shift in nuclear doctrine is taking place in both Russia and China that a ppears to reflect the need to respond to CPGS developments.[2] For example, China's Second Artillery Corps has been seriously considering "future scenarios in which China [would] have to consider scrapping the [No First Use] restrictions [...] and threaten nuclear retaliation for purely conventional attacks against the Chinese homeland."[3] They concluded that in a situation where conventional weapons are used in a manner that is similar to weapons of mass destruction, such as an attack on the Three Gorges Dam, then the use of nuclear weapons in response to such attacks would be a "retaliatory strike for de-escalation and possibly even war termination purposes."[4]

Russia too has stressed its concern with the development of CPGS programs.[5] This "growth in capability of the U.S. conventional strike force is another development that Russia has been watching with significant concern [as] many Russian analysts believe that improvements to the accuracy of non-nuclear strike systems and the supporting reconnaissance, communication, and command and control infrastructure could allow the United States to use its conventional forces to augment or even replace nuclear systems in missions that might involve an attack against key elements of Russia's strategic forces."[6] This concern was especially evident when Russian analyst Y. Miasnikov argued that experts in Russia believe that U.S. precision-guided weapons are a greater threat then BMD, as an effective stockpile of these precision-guided weapons continues to grow.[7] Considering that, at one time, American BMD systems were labeled as the single greatest threat to Russia,[8] the concern over CPGS developments cannot be understated.

1 Van Evera 2013, 252.
2 Cimbala 2017, 60; Christensen 2012.
3 Christensen 2012.
4 Medeiros 2006, 64.
5 Elaine M. Grossman, "Russian Experts Question Role of Conventional 'Prompt Global Strike' Weapons," Nuclear Threat Initiative, April 2009, accessed January 29, 2021, https://www.nti.org/gsn/article/russian-experts-question-role-of-conventional-prompt-global-strike-weapons/.
6 Podvig 2011, 45.
7 Miasnikov 2012.
8 Renz, Thornton 2012, 45.

With these concerns in mind, M. Schneider has stated that "military leaders [in Russia] have openly stated that Russia has deliberately lowered the nuclear use threshold and talked about the use of nuclear weapons in regional and local wars."[1] Specifically, in Russian doctrine, this seems to entail the use of nuclear weapons in response to conventional conflicts, as Russian military officials believe that "they are capable of nullifying the combat abilities of all modern conventional systems."[2] More recently, a translation of the "Fundamentals of the State Policy of the Russian Federation in the Field of Naval Operations for the Period until 2030" stated that "during the escalation of military conflict, demonstration of readiness and determination to employ non-strategic nuclear weapons capabilities is an effective deterrent."[3] While somewhat ambiguous, this does seem to indicate that Russia could use nuclear weapons in response to a conventional attack. Considering that the United States can theoretically use CGPS weapons to conduct or supplement a first strike on Russia, and that Russia has clear reservations about CPGS programs, this appears to be, at least in part, a response to this developing U.S. conventional superiority.

Of course, there are thinkers who suggest that the threat of CPGS weapons is overstated for a multitude of reasons. One such critique focuses on the ambiguity surrounding the threat of emerging technology and the fact that other historical examples demonstrate that these "technologies often have countervailing or conditional effects that can temper their negative consequences."[4] Despite having destabilizing effects, the emergence of new technologies can be stabilizing in other areas, and other factors may mediate the potential fallout for the international system.[5] While there certainly are valid points to this critique, the reverse is also true. Even if there are positives to developing CPGS weapons, the negative impact still exists. One does not cancel out the other.

On the other hand, it could simply be argued that deploying this technology will have greater benefits overall. In his paper exploring the deployment of conventional ballistic missiles, B.M. Sugden concludes that the United States ought to deploy CPGS weapons for missions "intended to defeat emerging, time-sensitive, soft targets, such as exposed WMD launchers, terrorist leaders, and sites of state transfers of WMD to terrorists or other states within roughly one hour of a decision to attack."[6] He does not deny that there are serious risks surrounding misperception,[7] or that these weapons could be used for larger-scale counter-nuclear missions.[8] He takes this one step further and argues that CPGS weapons could significantly shape the adversary's military investments and cause them to pump greater resources into supposedly defensive technology such as ballistic missile defense or hardened nuclear capabilities.[9] However, while it is evident that CPGS weapons have an influence on the defense strategies of America's adversaries, this paper has demonstrated that, rather than focusing on simply hardening their existing

1 Schneider 2008, 397.
2 Ibid., 413.
3 "Fundamentals of the State Policy of the Russian Federation in the Field of Naval Operations for the Period Until 2030," U.S. Naval War College, accessed January 29, 2021, https://digital-commons.usnwc.edu/rmsi_research/2.
4 Sechser et al. 2019, 727–735.
5 Ibid., 729.
6 Sugden 2009, 115.
7 Sugden 2009.
8 Ibid., 119.
9 Ibid., 122.

deterrent, states have adopted increasingly aggressive nuclear doctrines. In doing so, they seek to ensure that their deterrent capabilities remain credible in the face of new destabilizing technology. While there may be defendable uses of CPGS weapons in certain scenarios, this again does not negate or balance out the negative effects that this emerging technology has on deterrence.

Finally, there are significant technological difficulties that stand in the way of CPGS weapons becoming reliable tools. This primarily revolves around achieving the functional level of accuracy required for conventional weapons to be reliable at extreme ranges. As we have already stated, one such solution was to attach GPS systems to missiles. While this does appear to significantly increase their accuracy, the missiles "would be vulnerable to losing GPS signals due to vehicle maneuvers, enemy jamming, and plasma formation around the vehicle during the reentry phase."[1] This formation of plasma is particularly prevalent when hypersonic speeds come into play, and combining this speed with the required level of accuracy for CPGS weapons appears to be technically impossible at this time. In this light, discussing the strategic implications of perusing this technology may seem pointless at best, or even alarmist at worst. However, this line of thinking is incorrect and potentially dangerous. Regardless of the technological hurdles, it should not be assumed that they will always be there. Additionally, despite these difficulties, the United States is still actively pursuing a robust CPGS program designed to be delivered with hypersonic boost-glide technology.[2] This speaks to the belief that this combination of speed and accuracy is possible and will deliver tangible benefits. While we cannot be certain of this, the potential impact of this technology and the pursuit of it still merits significant review. Finally, just as with BMD, current technological limitations have not stopped other adversarial nations from reacting to the development of such technologies in the United States. This means that even if the pursuit of these technologies proves fruitless, their impact today remains relevant.

Suggestions

Developing CPGS systems comes with a multitude of risks, most important of which is the inherent degradation of deterrence. If the development of CPGS systems continues – and it appears that it will – then at the very least measures must be taken to limit its negative effects. The first step could involve ensuring that there is clear communication of intent prior to the launch of CPGS weapons. This reduces the possibility of a conventionally armed missile being mistaken for a potential nuclear strike. And this remains true, and is perhaps more relevant than ever, if the target of a CPGS weapon is Russia or China. Even a short amount of notice would likely reduce confusion and lessen the chance of uncontrolled conflict escalation.

Additionally, ensuring that CPGS weapons are land-based only and separate from known land-based nuclear weapons would reduce the ambiguity that comes with the use of CPGS weapons. Even in a dire crisis, it would be clear that a conventionally armed weapon has been launched, as it would be known that the point of origin does not house nuclear weapons. Keeping them geographically separate from nuclear weapons

1 Sugden 2009, 132.
2 Acton 2013, 2.

would reduce the likelihood of the two types of weapons being confused. Conversely, at sea, it would effectively be impossible to make the same sort of distinction between CPGS systems and SSBNs (ballistic missile submarines), as there is no way to tell whether a submarine is housing nuclear weapons when a launch is detected.[1]

Another way to lessen the instability caused by CPGS weapons is to have them be part of the New Strategic Arms Reduction Treaty (New START) or something similar in nature. While conventionally armed ballistic missiles fall under the purview of New START, hypersonic systems do not.[2] While ratifying the treaty, "the [U.S.] Senate made clear that the U.S. interpretation of the treaty precluded 'any prohibition on the deployment of such systems.' "[3] Adding hypersonic weapons to such a treaty would set a limit within which states can work to stabilize the number of CPGS weapons. At this time, the lack of restrictions on hypersonic weapons allows states to pursue strategic superiority over their adversaries. Without regulation, this presents an opportunity to deploy a dangerous number of strategic weapons, which would in turn create massive instability between the United States and its peer-adversaries. This, of course, is true for all states that are developing hypersonic weapons technology. Communication and confidence building must come from both sides.

However, while there are ways to reduce the number of negative issues (for example, missile ambiguity), the inherent degradation of deterrence caused by CPGS weapons and their hypersonic variants is somewhat unavoidable. Weapons will continue to become more and more accurate. But this is not related to nuclear deterrence, and the widespread nature of technological developments in this area means that it cannot be related. Accordingly, the problems pointed out in this and numerous other studies cannot be resolved by simply giving up the pursuit of these technologies. Even if a state were to put such programs on hold, the technology surrounding accuracy will continue to grow, and thus so too will the ability to lower the yield of warheads on missiles. In a sense, the world of deterrence is forever changing, and this new reality must be considered when discussing doctrine and arms control efforts.

With this in mind, even the above mentioned suggestion to include CPGS weapons in arms control regimes may not do enough in terms of combating the degradation of deterrence and CPGS systems. It could be argued that states could simply maintain relatively small numbers of these conventional weapons so that they can act as niche tools and do not pose a serious first-strike threat against states with larger nuclear weapons stockpiles (such as Russia). However, this argument fails to hold up to criticism. Not only would other states armed with a smaller number of nuclear weapons still see these CPGS weapons as existential threats to their nuclear deterrents, but these conventional weapons would also act as a powerful hurdle for meaningful disarmament. As we mentioned earlier, the world could suffer irreversible environmental damage if even less than 1% of the global stockpile of nuclear weapons were to be used.[4] Therefore, meaningful disarmament must, at the very least,

1 Acton 2013, 117.
2 Cameron Tracy, "Fitting Hypersonic Weapons into the Nuclear Arms Control Regime," Union of Concerned Scientists, April 2020, accessed January 29, 2021, https://allthingsnuclear.org/ctracy/fitting-hypersonic-weapons-into-the-nuclear-arms-control-regime.
3 Ibid.
4 Robock 2010, 419.

work to lower the number of nuclear weapons to a level which ensures – intentionally or otherwise – that such global devastation can never happen. However, as we have explored in this paper, CPGS systems create the possibility of a realistic first strike, and thus even a small number could act as a serious roadblock to lowering the number of nuclear weapons to the level previously suggested. Nonetheless, even if the increasing accuracy of CPGS weapons creates this reality for arms control activists, work in this direction must continue with due account of such technological developments. While this paper does not offer a concrete solution to this unavoidable problem, the combination of confidence- and security-building measures, together with clear communication and efforts to signal the lack of nuclear use could develop over time into genuine trust between adversaries. Just as old enemies became close allies in Europe, where the threat of attack is effectively non-existent, perhaps the United States and its peer-adversaries can one day achieve this same trust.

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Author

Peter James Mckenzie Rautenbach,
MSc Candidate in International Relations at the London School of Economics and Political Sciense,
Houghton St, Holborn, London WC2A 2AE.
e-mail: peterjmrautenbach@gmail.com

Additional information

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Угроза применения обычных видов вооружений для ядерной безопасности: новая реальность с точки зрения сдерживания

АННОТАЦИЯ

В данной работе рассматривается тезис о том, что развитие систем «Быстрый глобальный удар» (БГУ) размывает ядерную стабильность. Соединенные Штаты разрабатывают подобный вид обычных вооружений для их применения на театре военных действий, однако вследствие этого грань между тактическим и стратегическим оружием становится размытой. В Конгрессе США ведутся дискуссии по проблемам неопределенности в ракетно-ядерной сфере, самая крупная из которых заключается в том, что системы БГУ по своей сути размывают ядерный паритет. Рассматривая поведение крупнейших государств, ставших главной причиной для создания систем БГУ в США, и сочетая это с ранее существовавшей литературой и пониманием различных аспектов проблематики ядерного нераспространения, автор исследует воздействие БГУ на ядерную стабильность. По сравнению с ракетами-носителями ядерных боеголовок, наличие у США рассматриваемых систем обычных вооружений по своей природе опасно, поскольку оно повышает как вероятность их применения, так и вероятность нанесения первого удара по системам ядерного сдерживания другого государства. Традиционно нанесение первого ядерного удара является практически невозможным, поскольку оно влечет за собой ответный удар. Если ядерное оружие может быть заменено на системы вооружений БГУ, то вероятность первого удара кратно возрастает. Следовательно, в результате изменения ядерной доктрины с учетом систем БГУ, снижается порог применения ядерного оружия. Этот факт демонстрирует явные признаки снижения ядерной безопасности и, как следствие, увеличения вероятности применения ядерного оружия.

КЛЮЧЕВЫЕ СЛОВА

БГУ, сдерживание, ядерное оружие, первый удар, обычные вооружения, возникающие технологии

Сведения об авторе

Питер Раутенбах,

Магистр в области международных отношений в Лондонской школе экономики и политических наук, Houghton St, Holborn, London WC2A 2AE.

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