

*Non multa, sed multum*

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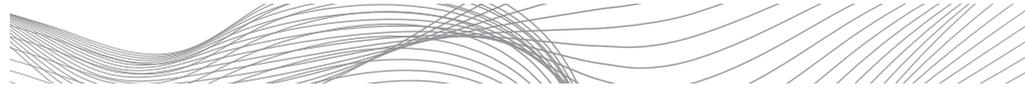
Global Edition

**Chase Joseph LeMay**

## U.S. and Russian Low-Yield Nuclear Weapons: Threats to Global Strategic Stability



MOSCOW, 2022



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Low-yield weapons have recently taken a prevalent position in global nuclear weapons doctrine as global stability is hitting one of the lowest points thus far in the 21st century. Major global actors such as the United States and the Russian Federation have either directly or indirectly written low-yield nuclear weapons into their nuclear doctrine as they build defenses to new perceived threats. The research goal is to identify whether low-yield weapons increase or decrease global strategic stability by considering the ramifications of their deployment on multiple levels of global stability.

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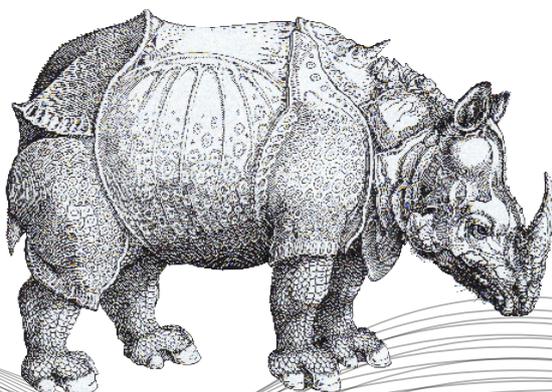
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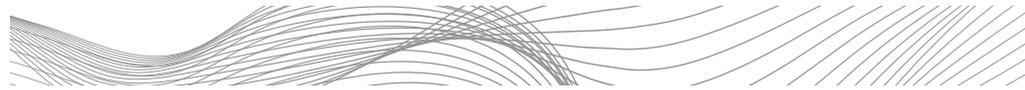
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## Highlights

- In the future, it is in the best interest to address the current security environment by any means first to improve the bilateral relationship between the U.S. and Russia. Low-yield nuclear weapons have become a centerpiece of U.S. and Russian nuclear doctrine, and the likelihood that either state would jeopardize those options in the current security environment is low.
- However, some steps that both states could take to improve their strategic relationship towards a degree where low-yield weapons could be addressed in the future include resuming strategic bilateral dialogue, increasing coordination and cooperation at the Review Conferences of the Non-Proliferation Treaty, and reaffirmation of the Reagan-Gorbachev principle in significant fora.
- While relying on traditional, strategic weapon deterrence for conflict prevention has already been heavily criticized, this shift towards reliance on low-yield deterrence has led to heightened regional security concerns, fears over failure of deterrence as a concept, and increased global tensions with intensifying risks of tipping delicate situations into high escalation risk scenarios.
- Action from the U.S. and Russia to begin work on decreasing the role these weapons play in their respective nuclear doctrines is a step which both states should take to prevent further deterioration of strategic stability in every aspect.
- The threat of low-yield nuclear weapons needs to be addressed, as their current effects on global strategic stability have proven that though they were designed to serve the strategic interests of the U.S. and Russia, the operationalization of low-yield options has instead produced a consistent deterioration of the security environment while threatening the upheaval of 80 years of deterrence.



# U.S. and Russian Low-Yield Nuclear Weapons: Threats to Global Strategic Stability

Chase Joseph LeMay

## INTRODUCTION

The significance of nuclear weapons in international relations and conflict studies is nearly impossible to over-emphasize. The second half of the twentieth century was marked by the desperate attempts of world powers to prevent horizontal proliferation and protect the world from devastating use of nuclear weapons via escalation or accident. The sheer destructive capabilities of nuclear weapons were enough for the Soviet Union and the United States of America, two major nuclear powers still in the dwindling years of the Cold War, to agree to a joint statement which has been a staple in nonproliferation debates since its release, “The sides, having discussed key security issues, and conscious of the special responsibility of the USSR and the U.S. for maintaining peace, have agreed that a nuclear war cannot be won and must never be fought.”<sup>1</sup> This sentiment has been reaffirmed numerous times in various fora, recently as a joint statement in January 2022 from the leaders of the five nuclear weapon states as defined by the Treaty on the Non-Proliferation of Nuclear Weapons: The French Republic, the United Kingdom, the People’s Republic of China, the United States of America, and the Russian Federation.<sup>2</sup> Their commitments to preventing nuclear war are quintessential in preserving global peace, and the weight of that responsibility lies squarely on their shoulders.

However, developments in global security and national interests point towards a concerning trend. The same global powers whose responsibility is to preserve global peace by preventing nuclear war are bringing us closer to the precipice with the development and modernization of new nuclear weapon systems – all in the name of preserving deterrent capabilities. These developments take the form of hypersonic weapons, nonstrategic nuclear weapons, or missile defense systems, all of which challenge the basic understanding of

<sup>1</sup> Reagan, R. (1985, November 21). Joint Soviet-United States Statement on the summit meeting in Geneva. Ronald Reagan Presidential Library & Museum. Retrieved June 9, 2022, from <https://www.reaganlibrary.gov/archives/speech/joint-soviet-united-states-statement-summit-meeting-geneva>

<sup>2</sup> The United States Government. (2022, January 3). Joint statement of the leaders of the five nuclear-weapon states on preventing nuclear war and avoiding arms races. The White House. Retrieved June 9, 2022, from <https://www.whitehouse.gov/briefing-room/statements-releases/2022/01/03/p5-statement-on-preventing-nuclear-war-and-avoiding-arms-races/>

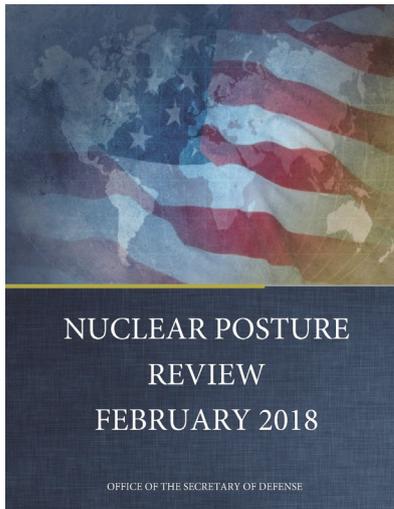
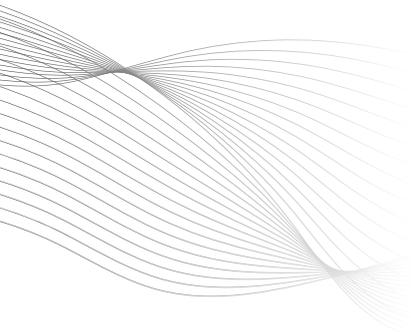
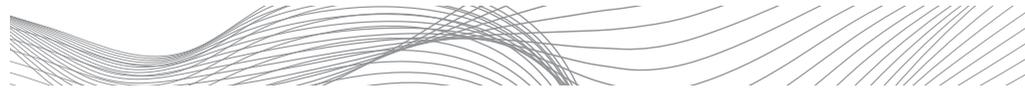
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nuclear deterrence by creating potential pathways to inadvertent nuclear conflict. Reduced reaction times, dual-capable systems, and creation of highly maneuverable delivery systems have evolved the contemporary definition of nuclear capabilities and increased escalation risk. But amongst all the advances and modernization efforts, one of the most significant and dangerous in regards to preservation of the norms of nonproliferation and the nuclear taboo is the continued development and operationalization of low-yield nuclear weapons.

Low-yield weapons have recently taken a prevalent position in global nuclear weapons doctrine as global stability is hitting one of the lowest points thus far in the 21<sup>st</sup> century. Major global actors such as the United States and the Russian Federation have either directly or indirectly written low-yield nuclear weapons into their nuclear doctrine as they build defenses to new perceived threats. However, while these low-yield weapons are developed in an attempt to strengthen deterrence and fill security gaps, many critics argue these weapons only blur the line between nuclear and conventional conflict. If they are not addressed, the inclusion and normalization of low-yield nuclear weapons could introduce dangerous new threats to global security, and resurface risks which have not been seen since the twentieth century. By examining both U.S. and Russian low-yield weapons development, this analysis seeks to determine this: how have the United States and the Russian Federation developed and operationalized low-yield nuclear options, and do these low-yield alternatives act as a direct threat to global strategic stability or bolster deterrence efforts?

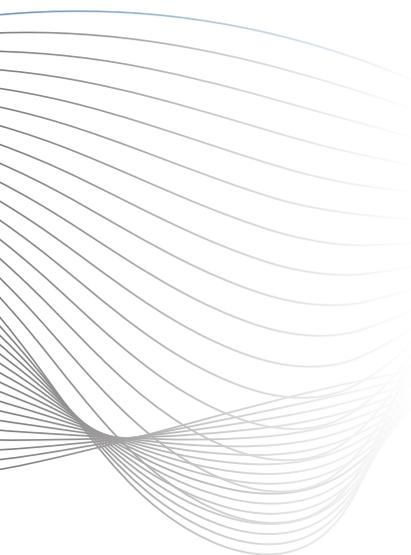
The subject of this research is on low-yield nuclear weapons, with a distinct focus on the low-yield weapons in U.S. and Russian arsenals. The Russian and U.S. low-yield nuclear weapons were isolated for this research to address how their specific strategic relationship introduced low-yield nuclear weapons into the nuclear debate, and to explore how their current relationship is influencing strategic stability in its entirety. The research goal is to identify whether low-yield weapons increase or decrease global strategic stability by considering the ramifications of their deployment on multiple levels of global stability. The concrete objectives of this research are to provide recommendations to relevant decision-making bodies in the United States and the Russian Federation, to identify potential avenues to address the threats these low-yield weapons pose and provide information as to why the suggestions provided should be priority actions to address low-yield nuclear weapons.

In order to conduct research for this paper, historical analyses were conducted using research done by other academics and relevant professionals in the field in order to determine national perspectives on low-yield nuclear weapons from the Russian



Cover of Nuclear Posture Review February 2018

Source: [www.dod.defense.gov](http://www.dod.defense.gov)



Federation and the United States. Then, using the historical elements as context, comparative analyses between analysts who have written on the subject of low-yield nuclear weapons were conducted to determine the impact that these weapons had on strategic stability up to this point; in order to gain a spectrum of knowledge on the subject, this paper took into account the opinions of academics who support the operationalization of low-yield nuclear weapons in addition to those who do not support them as viable options.

There are a significant number of research papers and chapters of journals devoted to low-yield nuclear weapons, as many scholars have focused on low-yield warheads as a significant element of nonstrategic nuclear weapons. However, unlike the existing journals, the methodology of this paper included a heavy reliance on not only these existing journals but a substantial amount of news articles and mass-media sources. This is largely due to the fact that the global security environment in early 2022 has been destabilized by the ongoing conflict in Ukraine, providing analysts with new elements to comment on daily. The inclusion of elements of destabilization from the ongoing conflict in Ukraine provides this writing with a unique opportunity to address these aspects in real time. The context for this research started with the knowledge that the 2018 U.S. Nuclear Posture Review had outlined necessity for low-yield nuclear weapons as a necessary deterrent factor, but the question arose of if this was true or counter-productive.

The paper will examine these questions by analyzing both historical and contemporary trends from the United States and Russia based on open-source literature, and will seek to answer not only in what ways strategic stability has been affected but also what steps could be taken by relevant parties to ameliorate global conditions. In providing historical context to this question, the intentions are to illuminate not only the decisions made throughout the nuclear development history of each country, but to also provide insight into each nation's perceived threats which may have motivated their decisions. Both the United States and Russia have considerable historic backgrounds on their development of low-yield nuclear weapons, and their rationales for these developments are inconsistent. All details provided have been incorporated from existing literature and relevant news outlets, with information included spanning Cold War documents to breaking news coverage of current events.

The impact of low-yield weapons on strategic stability is well-researched, but there have been no conclusive results. The existing literature on the subject covers a wide variety of topics including the utility of nuclear weapons, the history of low-yield weapons development, potential problems which could arise from their operationalization, and their impact on strategic stability. However, this paper takes these crucial elements from other

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analysts and applies the significant details to the current security environment. Literature on the subject is extremely divided, with some arms control proponents calling for the elimination of low-yield systems like the ones announced in the 2018 NPR, while others called for further considerations to increase low-yield capabilities to counter Russian and Chinese nonstrategic weapons development.<sup>3, 4</sup> Scholars who are considering the impact of low-yield nuclear weapons have speculated on conditions for use in the past, but the events addressed in this article lack significant analysis at this point. Therefore, an objective of this paper is also to contribute to the ongoing discussions by scholars and analysts.

The starting point of this paper was knowing the divisive nature of low-yield nuclear weapons, and researching concepts such as limited nuclear war, nonstrategic weapons, escalate to de-escalate, and strategic stability. In his work, Andrew Facini, from the *Belfer Center for Science and International Affairs*, raised a number of points on miscalculation, the events which led the United States and Russia to their current deteriorating strategic relationship, and potential temptations of low-yield nuclear weapons.<sup>5</sup> He proposes that decision-makers utilize caution moving forwards, being careful not to field technologies faster than plans are made to accommodate them.<sup>6</sup> Alternatively, supporters of low-yield nuclear weapons believe that they provide a necessary deterrent value to the U.S. nuclear arsenal, where according to Major Derek Williams, a B-52 Weapons Officer, suggested that they prevent “a situation where the only two options are suicide or surrender.”<sup>7</sup> He proposes that the perceived risk involving a nuclear weapon far outweighs the risk posed by conventional weapons, invalidating the claims that conventional superiority is sufficient.<sup>8</sup> These points guided the research for this paper to an understanding of how low-yield nuclear weapons impact not only the capabilities of a state within limited nuclear war, but also affect the decisions they would make based on their interpretation of escalation dominance. When the conflict in Ukraine escalated on February 24, 2022, it revitalized the already prominent debate on low-yield weaponry. Discourse



The same global powers whose responsibility is to preserve global peace by preventing nuclear war are bringing us closer to the precipice with the development and modernization of new nuclear weapon systems – all in the name of preserving deterrent capabilities

<sup>3</sup> Geller, P.-J. (2022, January 26). Enhancements to the U.S. nuclear deterrent needed now, more than ever. The Heritage Foundation. Retrieved June 13, 2022, from <https://www.heritage.org/defense/commentary/enhancements-the-us-nuclear-deterrent-needed-now-more-ever>

<sup>4</sup> Office of the Secretary of Defense, 2018 Nuclear Posture Review (2018). U.S. Department of defense. Retrieved June 10, 2022, from <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

<sup>5</sup> Facini, A. (2021, February 4). The low-yield nuclear warhead: A dangerous weapon based on bad strategic thinking. Bulletin of the Atomic Scientists. Retrieved June 13, 2022, from <https://thebulletin.org/2020/01/the-low-yield-nuclear-warhead-a-dangerous-weapon-based-on-bad-strategic-thinking/>

<sup>6</sup> Ibid.

<sup>7</sup> Williams, D., & Lowther, A. B. (2021, April 12). Lower-yield weapons will raise, not lower, the threshold for nuclear use. Defense One. Retrieved June 13, 2022, from <https://www.defenseone.com/ideas/2017/08/lower-yield-weapons-will-raise-not-lower-threshold-nuclear-use/140610/>

<sup>8</sup> Ibid.



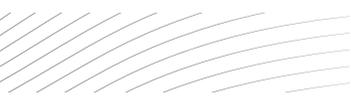
on the topic flooded the news and various media platforms, and written analyses were quickly published. This article benefits from having long-standing perspectives on low-yield weaponry as well as fresh, unanalyzed information from relevant events which contribute to the discussion.

One basic issue regarding low-yield nuclear weapons is the lack of coherence in previous publications, as there is a lack of global, standard definitions for important terms where many of them may be used in a one size fits all approach across academia or there is simply no agreed definition on relevant technical details. This paper acknowledges that the working definitions created by other individuals, organizations, or governments may differ from the ones referenced here, and any projects or publications that are cited in this work may not consider the same limits on relevant issues that are reflected here. Where there are significant discrepancies between definitions on commonly utilized terms, this analysis attempts to create a working definition which encompasses the most important aspects.

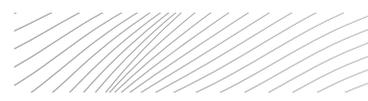
The United States history delves into its early tactical weapons development in the 20<sup>th</sup> century and considers how its policy regarding the Russian Federation after the collapse of the Soviet Union contributed to contemporary Russian foreign policy. It also outlines current U.S. policies and acknowledges the incentives the U.S. has to maintain its low-yield options. The history of the Russian Federation details the development of Russian nonstrategic nuclear weapons in response to potential threats from the West and the whispers of limited nuclear war. In current events, it addresses recent published doctrinal clarifications and their contribution to global instability. It also acknowledges current function of low-yield nuclear weapons in relation to developments in Ukraine.

The analysis chapter breaks down how low-yield weapons have impacted strategic stability on various levels to determine if and how these weapons have changed the security environment – whether they bolstered deterrence or contributed to global destabilization. This was done by considering multiple levels of strategic stability and the various components which comprise it; addressing arms stability, crisis stability, and deterrence stability are all crucial in understanding the full extent of how strategic stability has shifted.

From the analysis of these events and concepts, the following section will offer a number of suggestions which could be utilized to improve global strategic stability. These suggestions will include both specific policy recommendations as well as general concepts to pursue in order to re-create the conditions necessary for large-scale progress, and will be addressed to all relevant parties either individually or collectively. The suggestions are intended to help address issues which the low-yield nuclear option has impacted by bridging information gaps, contributing to general U.S.-Russian



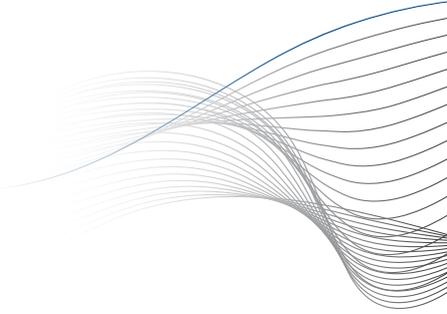
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relations, reducing the risk of nuclear escalation, and working towards a security environment which can eventually limit or eliminate the function of low-yield nuclear weapons. These recommendations may be of interest to negotiation teams between the United States and the Russian Federation in determining options for bilateral agreements, as well as for educational purposes on the impact of modernization efforts on strategic stability.

In the future, it is in the best interest to address the current security environment by any means first to improve the bilateral relationship between the U.S. and Russia. Low-yield nuclear weapons have become a centerpiece of U.S. and Russian nuclear doctrine, and the likelihood that either state would jeopardize those options in the current security environment is low. However, some steps that both states could take to improve their strategic relationship towards a degree where low-yield weapons could be addressed in the future include resuming strategic bilateral dialogue, increasing coordination and cooperation at the Review Conferences of the Non-Proliferation Treaty, and reaffirmation of the Reagan-Gorbachev principle in significant fora.

Transparency and confidence-building measures will be essential moving forwards in order to re-establish a working relationship between the states. Low-yield nuclear weapons are dangerous to global strategic stability, but the practical way to address them is to first address the underlying issues and bring global security back to levels where meaningful work can be done.





## U.S. NUCLEAR FORCES AND THE LOW-YIELD OPTION

### Historical context in development

To be able to explore how low-yield weapons have impacted strategic stability, considering the rationale behind their development and the relevant history is crucial in analyzing their effects. This chapter will address relevant historical details, weapons of interests in the U.S. nuclear arsenal, as well as policies and doctrinal details which highlight the importance of low-yield nuclear weapons to U.S. nuclear doctrine. For both this chapter and the one following it which addresses Russian nuclear forces, providing historical context is to not only establish background information for the analysis, but to highlight that when these options were originally developed, they were seen by decision-makers as a responsible option in the nuclear age. The analysis will later determine if those sentiments remain true as we see the intentions of modern policy-makers.

Since their development, nuclear weapons have been integral to U.S. policy in deterring potential Soviet or Russian aggression – clearly exhibited by the expansive arsenal developed with an array of use options. Originally, the United States began developing a number of low-yield nuclear weapons as a cheap and easily produced means of deterrence on the ground, where a cavalier attitude towards deployment of battlefield nuclear weapons normalized their utility in response to developments by the Soviet Union and the events of the Korean War.<sup>9</sup> The United States began its track towards a feasible use plan of its already extensive arsenal of nonstrategic and low-yield weapons when it adopted the *flexible response* doctrine of the Kennedy administration, which advocated for extended deterrence via flexible nuclear options and strong conventional forces rather than reliance on massive retaliation. Leaning into the concept of limited nuclear war, the idea of flexible response held that rather than responding with the full force of the U.S. nuclear arsenal, the U.S. could respond to provocation with a *controlled, graduated nuclear response*.<sup>10</sup> This policy opened the door for the development of multiple low-yield, tactical nuclear weapons deployed by the U.S. military in the height of the Cold War.

Between the two superpowers, the United States was the first to begin developing these tactical weapons with an emphasis on their potential use, as development of nonstrategic nuclear weapons was to cover for perceived shortcomings against the Soviet Union's

<sup>9</sup> Nichols, T. M., Stuart, D. T., & McCausland, J. D. (2012). Tactical Nuclear Weapons and Nato. Strategic Studies Institute, US Army War College.

<sup>10</sup> Gavin, F. J. (2001). The Myth of Flexible Response: United States Strategy in Europe during the 1960s. *The International History Review*, 23(4), 847–875. <http://www.jstor.org/stable/40108839>

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conventional superiority in Europe. U.S. officials believed that the next war over Europe could be fought using nuclear weapons, and began developing numerous applications for their deployment. In the 1960s, the ideas for a limited nuclear war possibilities were being shared and circulated, but technical restraints had allegedly forced the postponement of any response other than the pre-programmed, massive retaliation Single Integrated Operational Plan (SIOP) offered at the time. The original SIOP strikes, criticized for their overkill, would have seen a pre-emptive nuclear strike of more than 3200 nuclear weapons against 1060 targets, and a retaliatory strike of 1706 nuclear weapons against 725 targets, with targets comprised of military control centers, nuclear weapon facilities, and cities throughout regions of opposition.<sup>11</sup> It was the Kennedy Administration, specifically Secretary of Defense Robert McNamara, who claimed that the concept of flexible response would allow the U.S. to control its nuclear forces in response to any military situation it may face which could call for a nuclear response.<sup>12</sup> While the United States had been developing the weapons to respond to the threat of potential limited war with the Soviet Union, the United States' command and control capabilities were severely limited until the mid-1970s, and realistically it was the rhetoric of flexible response that was more prevalent than actual operational readiness.<sup>13</sup> Realistically, flexible response was mainly an aspiration which led to increased development of nonstrategic nuclear weapons, and it "[was] not easy (if at all possible) to find a single coherent, clear statement of it, even among authoritative pronouncements of the President and the Secretary of Defense."<sup>14</sup> While the full operational status of the revised flexible response option was questionable, nonstrategic nuclear weapons were definitely a significant factor in NATO deterrence policy in Europe, where they maintained that status until the threat of full-scale attack on Europe was eliminated.

The end of the Cold War saw the beginning of a steep decline in both the U.S. and Russian nonstrategic weapons arsenals – the U.S. arsenal alone saw a reduction from approximately 9,000 tactical warheads in 1989 to approximately 230.<sup>15</sup> These reductions mostly occurred due to multiple unilateral decisions which were mutually reciprocated, designated the Presidential Nuclear Initiatives, after a series of successes in other arms control negotiations in the late 1980s and early 1990s. The remaining 230 nonstrategic nuclear



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<sup>11</sup> The National Security Archive. (2004, July 13). U.S. Nuclear War Plans A "Hazard to Ourselves as Well as Our Enemy". The National Security Archive. Retrieved June 10, 2022, from <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB130/press.htm>

<sup>12</sup> Gavin, F.J. (2001). The Myth of Flexible Response. <http://www.jstor.org/stable/40108839>

<sup>13</sup> Ibid.

<sup>14</sup> Wainstein, L. et al. (June 1975) "The Evolution of US Strategic Command and Control and Warning, 1945-72", Institute for Defense Analyses [Washington, DC], Department of Defense Information Office, from <https://apps.dtic.mil/sti/citations/ADA331702>

<sup>15</sup> Kristensen, H. M., & Korda, M. (2019). Tactical Nuclear Weapons, 2019. Bulletin of the Atomic Scientists, 75(5), 252–261. <https://doi.org/10.1080/00963402.2019.1654273>



weapons maintained by the United States are all modifications of the B61 – their primary function as a deterrent measure for NATO members in Europe.

## NATO nuclear sharing

The United States maintained a number of nonstrategic nuclear options in Europe throughout the Cold War, utilizing gravity bombs, short-range ballistic and cruise missiles, as well as nuclear mines and artillery.<sup>16</sup> At that point in both U.S. and Russian history, the term nonstrategic was practically synonymous with low-yield as strategic nuclear weapons being armed with higher-yield warheads was the status quo, and though that is not the case in today's discussions the actions taken to reduce nonstrategic weapons in the late 20<sup>th</sup> century directly addressed stockpiles of low-yield nuclear weaponry. These weapons were prominent in discussions as U.S. officials during the Cold War genuinely thought a war over Europe would be fought using nuclear weapons, thus the arrangement was created to establish greater NATO defenses against perceived Soviet conventional superiority through an effective nuclear deterrent.

After the collapse of the Soviet Union, NATO reiterated the importance of its nuclear sharing policies as a part of the alliance's unity. In 1997, the publication *Founding Act on Mutual Relations, Cooperation, and Security Between the Russian Federation and the North Atlantic Treaty Organization* specified that NATO had no intentions to deploy nuclear weapons on the territory of any of the new member states, but that even with the threat of conflict with the Russians had since declined, it saw no need to “to change any aspect of NATO's nuclear policy—and [did] not foresee any future need to do so.”<sup>17</sup>

Even today, decades after the end of the Cold War, U.S. NATO allies engage in nuclear sharing they claim is in the name of their collective security. The NATO allies possess 150 of the remaining U.S. nonstrategic nuclear weapons at Kleine Brogel Air Base in Belgium, Büchel Air Base in Germany, Aviano Air Base and Ghedi Torre Air Base in Italy, Volkel Air Base in The Netherlands, and Incirlik Air Base in Turkey.<sup>18</sup> The arrangement provides that these

<sup>16</sup> Sokov, N. (2022). The Russian Nonstrategic Nuclear Posture: History, Missions, and Prospects. *Everything Counts: Building a Control Regime for Nonstrategic Nuclear Warheads in Europe*, #55, 19–50. Retrieved June 10, 2022, from <https://nonproliferation.org/wp-content/uploads/2022/05/op55-everything-counts.pdf#page=26>.

<sup>17</sup> Nato. (2009, October 12). *Founding act on mutual relations, cooperation and security between NATO and the Russian Federation* signed in Paris, France. NATO. Retrieved June 10, 2022, from [https://www.nato.int/cps/en/natohq/official\\_texts\\_25468.htm](https://www.nato.int/cps/en/natohq/official_texts_25468.htm)

<sup>18</sup> Degtyarev, N., & Orlov, V. (2020, October). NATO NUCLEAR SHARING ARRANGEMENTS: WHETHER THEY ARE COMPLIANT WITH THE NPT. ASSESSMENT OF THE CURRENT SITUATION IN THE CONTEXT OF THE UPCOMING NPT REVIEW CONFERENCE. PIR Center. Retrieved June 10, 2022, from <http://www.pircenter.org/en/articles/2227-7901433#:~:text=Russia%20strongly%20opposes%20the%20maintenance,arouse%20unnecessary%20tension%20and%20suspicion>

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weapons are under U.S. control and allows for their transfer to these NATO allies in the event of war, but maintenance and procedures for safety and security are undertaken exclusively by the United States.<sup>19</sup>

NATO nuclear sharing has been a serious contention point between the United States and the Russian Federation since the concept of a NATO Multi-Lateral Force was publicly announced in May 1961.<sup>20</sup> While the U.S. defends NATO nuclear sharing by highlighting that the arrangements predate the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), Russia has publicly called out the U.S. for violating the spirit of the treaty by sharing nuclear weapons and involving non-nuclear weapon states' military personnel in training exercises.<sup>21</sup> Specifically, Russia has noted that the United States is the only nuclear weapon state with *forward-based non-strategic nuclear weapons outside its territory*, and that the B61-12, the new modification of the B61s which have historically been deployed to NATO allies, drastically lowers the nuclear threshold.<sup>22</sup> The Russian Federation has been incredibly clear about its position on NATO nuclear sharing, and with the recent declaration of intentions for Sweden and Finland to join NATO, the issue of NATO encroaching on Russia's border and the problem of U.S. nonstrategic weapons in Europe is a problem that will likely become more prevalent in the near future.



A flight test body for a B61-12 nuclear weapon

Source: [www.workers.org](http://www.workers.org)

## U.S. nuclear weapons of interest

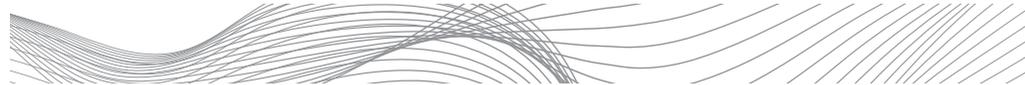
When it comes to U.S. low-yield nuclear weapons, the conversation has shifted significantly in the last four years due to the Trump Administration's 2018 Nuclear Posture Review (NPR). The release introduced two new plans for low-yield nuclear weapons: the W76-2, which would be mounted on the Trident-II submarine-launched ballistic missile, and a low-yield submarine-launched cruise missile which only recently had its budget zeroed out by the Biden Administration. The other low-yield weapon of interest is the B61-12, which is currently entering the late stages of its planned life extension program. These three weapons, either developed, deployed, or simply planned, have significant impact on strategic stability and are perfect examples for how low-yield

<sup>19</sup> NATO/OTAN. (2022, February). February 2022 NATO's nuclear sharing arrangements. North Atlantic Treaty Organization. Retrieved June 10, 2022, from [https://www.nato.int/nato\\_static\\_fl2014/assets/pdf/2022/2/pdf/220204-factsheet-nuclear-sharing-arrange.pdf](https://www.nato.int/nato_static_fl2014/assets/pdf/2022/2/pdf/220204-factsheet-nuclear-sharing-arrange.pdf)

<sup>20</sup> Degtyarev, N., & Orlov, V. (2020, October). NATO NUCLEAR SHARING ARRANGEMENTS: <http://www.pircenter.org/en/articles/2227-7901433#:~:text=Russia%20strongly%20opposes%20the%20maintenance,arouse%20unnecessary%20tension%20and%20suspicion>

<sup>21</sup> Ibid.

<sup>22</sup> Ibid.



Even today, decades after the end of the Cold War, U.S. NATO allies engage in nuclear sharing they claim is in the name of their collective security

weapons impact the global security environment.

The W76-2 was announced in Trump's NPR as a short-term measure which would increase the U.S. capacity for flexible response. The report claimed that the SLBM warhead would help to close any perceived gaps in U.S. regional deterrence capabilities and would be capable of penetrating missile defense systems.<sup>23</sup> The warhead, designed to be fitted onto the Trident-II/Trident D-5 SLBM, has an approximate yield of 8kt compared to its predecessor the W76-1 which has an approximate yield of 100kt.<sup>24,25</sup> After plans for a new warhead were announced in early 2018, the USS Tennessee became the first vessel to deploy armed with the new W76-2 warheads in late 2019.

The other low-yield option listed in Trump's NPR, a sea-launched cruise missile, was initially rostered as a long-term aid for U.S. deterrence capabilities. Designated SLCM-N, the goal of the low-yield cruise missile was to bolster flexible response capabilities and strengthen deterrence against potential regional aggression, whilst simultaneously acting as a direct response to Russian development of the 9M729 GLCM in violation of the 1987 INF Treaty.<sup>26</sup> While the funding for the SLCM was eliminated in the 2023 Navy FY2023 budget request, there are still plenty of high-ranking officials and analysts who support the program. General Mark A. Milley, Chairman of the Joint Chiefs of Staff, stated he supported the SLCM as another option for the President to consider, and argued that the president "deserves to have multiple options to deal with national security situations," and the SLCM could have provided the United States with leverage in the conversation on limiting shorter-range nuclear missiles.<sup>27</sup> While the current administration agrees with the elimination of funding, it is prudent to mention in an analysis of low-yield nuclear weapon developments purely for the fact the U.S. began taking such steps to bring a nonstrategic weapon back into the conversation, as the last cruise missile with similar capabilities was the TLAM-N which was completely retired in 2013.<sup>28</sup>

The B61-12 is the latest in a line of mods to the original B61 which began its development in 1963 and entered service in

<sup>23</sup> Office of the Secretary of Defense, 2018 Nuclear Posture Review (2018). U.S. Department of defense. Retrieved June 10, 2022, from <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

<sup>24</sup> Kaplan, F. (2020, February 18). The senseless danger of the military's new "low-yield" nuclear warhead. Slate Magazine. Retrieved June 10, 2022, from <https://slate.com/news-and-politics/2020/02/low-yield-warhead-nuclear-weapons-navy-trident-submarines.html>

<sup>25</sup> Woolf, A. F. (2021, January 5). A Low-Yield, Submarine-Launched Nuclear Warhead: Overview of the Expert Debate. Congressional Research Service. Retrieved June 10, 2022, from <https://sgp.fas.org/crs/nuke/IF11143.pdf>

<sup>26</sup> USNI News. (2022, April 27). Report to Congress on sea-launched nuclear cruise missile. USNI News. Retrieved June 10, 2022, from <https://news.usni.org/2022/04/27/report-to-congress-on-sea-launched-nuclear-cruise-missile>

<sup>27</sup> Ibid.

<sup>28</sup> Woolf, A. F. (2022, April 26). Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N). Congressional Research Service. Retrieved June 10, 2022, from <https://s3.documentcloud.org/documents/21748548/if12084.pdf>

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1968.<sup>29,30</sup> Overall, the B61-12 Life Extension Program (LEP) aimed to refurbish all nuclear and non-nuclear components of the bombs, effectively extending their service life by twenty years at least. There are currently 4 variants of the B61 which remain in the U.S. stockpile – the 3, 4, 7, and 11 – with the B61-12 set to replace the 3, 4, and

7 variants.<sup>31</sup> The B61-12 can be fired in ballistic gravity or guided drop mode, is highly accurate with an estimated accuracy of 30m, utilizes an inertial navigation system (INS), and includes four yield options at 0.3kt, 1.5kt, 10kt, and 50kt.<sup>32</sup> While there have been no significant changes in military characteristics in the LEP, critics claim that these combined factors make the B61-12 a significant danger when considering feasibility of use. Mikhail Ulyanov, Director of the Russian Foreign Ministry’s Non-Proliferation and Weapons Control Department, claimed that the B61-12 will lower the threshold for nuclear use, and that U.S. specialists defended the bomb as more ethical due to increased accuracy, highlighting its reduced effects on civilians.<sup>33</sup> However, proponents celebrate the function of the B61-12, such as Hon. Madelyn R. Crendon, then Assistant Secretary of Defense for Global Strategic Affairs for the U.S. Department of Defense, who claimed that the LEP “[would] reassure our nonnuclear allies and partners that their security interests will be protected, leaving no need for them to develop nuclear-deterrent capabilities of their own.”<sup>34</sup> She continued to state that the B61-12 is “critical to U.S. nuclear deterrence and is viewed by the administration and others as the cornerstone of our extended deterrence commitment to allies around the globe.”<sup>35</sup> A



Variety of nonstrategic nuclear weapons the Russian can employ compared to the sole U.S. nonstrategic nuclear option: the B61. The U.S. uses this imagery as rationale for development of the B61 Mod 12, which will replace Mods 3, 7, and 7

Source: 2018 Nuclear Posture Review Final Report

<sup>29</sup> Kristensen, H. M., & Norris, R. S. (2015). The B61 family of nuclear bombs. *Bulletin of the Atomic Scientists*, 70(3), 79–84. <https://doi.org/10.1177/0096340214531546>

<sup>30</sup> National Nuclear Security Administration. (2021, December 2). NNSA completes First Production Unit of B61-12 life extension program. *Energy.gov*. Retrieved June 10, 2022, from <https://www.energy.gov/nnsa/articles/nnsa-completes-first-production-unit-b61-12-life-extension-program>

<sup>31</sup> Ibid.

<sup>32</sup> Joshi, R. (2020, November 6). B61-12 nuclear bomb. *Airforce Technology*. Retrieved June 10, 2022, from <https://www.airforce-technology.com/projects/b61-12-nuclear-bomb/>

<sup>33</sup> TASS. (2021, August 29). US B61-12 nukes may lower threshold of using nuclear weapons, diplomat says. *Tass.com*. Retrieved June 10, 2022, from [https://tass.com/politics/962483?utm\\_source=google.com&utm\\_medium=organic&utm\\_campaign=google.com&utm\\_referrer=google.com](https://tass.com/politics/962483?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.com)

<sup>34</sup> Committee on Armed Services & Rodgers, M. [Report], (2013) NUCLEAR WEAPONS MODERNIZATION PROGRAMS: MILITARY, TECHNICAL, AND POLITICAL REQUIREMENTS FOR THE B61 LIFE EXTENSION PROGRAM AND FUTURE STOCKPILE STRATEGY (2014). U.S. GOVERNMENT PRINTING OFFICE. Retrieved June 10, 2022, from <https://www.govinfo.gov/content/pkg/CHRG-113hhrg86075/html/CHRG-113hhrg86075.htm>.

<sup>35</sup> Ibid.



table including statistics on known U.S. nuclear weapons from the Bulletin of the Atomic Scientists report *U.S. nuclear weapons, 2022* is included below, in which are current estimates.

Type/Designation	No.	Year deployed	Warheads x yield (kilotons)	Warheads (total available) <sup>a</sup>
<b>ICBMs</b>				
LGM-30 G Minuteman III				
Mk-12A	200	1979	1-3 W78 x 335 (MIRV)	600 <sup>b</sup>
Mk-21/SERV	200	2006 <sup>c</sup>	1 W87 x 300	200 <sup>d</sup>
<b>Total</b>	<b>400<sup>e</sup></b>			<b>800<sup>f</sup></b>
<b>SLBMs</b>				
UGM-133A Trident II D5/LE 14/280 <sup>g</sup>				
Mk-4A		2008 <sup>h</sup>	1-8 W76-1 x 90 (MIRV)	1,511 <sup>i</sup>
Mk-4A		2019	1-2 W76-2 x 8 (MIRV) <sup>j</sup>	25 <sup>k</sup>
Mk-5		1990	1-8 W88 x 455 (MIRV)	384
<b>Total</b>	<b>14/280</b>			<b>1,920<sup>l</sup></b>
<b>Bombers</b>				
B-52 H Stratofortress	87/46 <sup>m</sup>	1961	ALCM/W80-1 x 5-150	500
B-2A Spirit	20/20	1994	B61-7 x 10-360/-11 x 400 B83-1 x low-1,200	288
<b>Total</b>	<b>107/66<sup>n</sup></b>			<b>788<sup>o</sup></b>
<b>Total strategic forces</b>				
<b>Nonstrategic forces</b>				
F-15E, F-16C/D, DCA	n/a	1979	1-5 B61-3/-4 bombs x 0.3-170 <sup>p</sup>	200
<b>Total</b>				<b>200<sup>q</sup></b>
<b>Total stockpile</b>				
Deployed				1,744 <sup>r</sup>
Reserve (hedge and spares)				1,964
<b>Retired, awaiting dismantlement</b>				
<b>Total inventory</b>				
				<b>5,428</b>

Statistics on strategic and nonstrategic nuclear weapons of the United States

Source: Bulletin of the Atomic Scientists report *United States nuclear weapons, 2022*, prepared by Hans M. Kristensen and Matt Korda

1.4 Flexible response in Trump’s nuclear posture review

The 2018 Nuclear Posture Review solidified one major initiative in U.S. nuclear policy – establishing that it was willing to develop its nonstrategic (and more importantly low-yield) nuclear weapons in order to counter any perceived advantage that potential adversaries could believe they have by deploying tactical nuclear weapons. The final report includes an entire section titled *Enhancing Deterrence with Non-Strategic Nuclear Capabilities* which directly identifies its perception of Russia’s potential utility of low-yield nuclear weapons. The report highlights that Russia’s potential perceived advantage could stem from its larger stockpile and greater variety of nonstrategic nuclear weapons.<sup>36</sup>

This confidence in a potential conflict is what the U.S. sought to reduce in its development of the W76-2 and the intended development of the SLCM-N. These weapons fall under what the NPR calls *tailored deterrence options* which it defends by claiming these weapons are “important for the preservation of credible deterrence against regional aggression” and would “raise the nuclear threshold and help ensure that potential adversaries perceive no possible advantage in limited nuclear escalation.”<sup>37</sup> Tailored deterrence is just another modern application of flexible

<sup>36</sup> Office of the Secretary of Defense, 2018 Nuclear Posture Review (2018). U.S. Department of defense. Retrieved June 10, 2022, from <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.  
<sup>37</sup> Ibid.

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response, and though it uses updated terminology the concept remains the same: it provides the President with a variety of options to utilize in the event of nuclear escalation.

However, regardless of the weapons that the U.S. sought to employ to match Russian capabilities, the report claims that the “spectrum of capabilities sized and postured to meet U.S. needs” does not intend to support the concept of nuclear war-fighting.<sup>38</sup> The U.S. claims that its development of low-yield nuclear options is in response to Russia’s alleged *escalate to de-escalate* military doctrine, and in no way is an attempt to promote the feasibility of limited nuclear war as is alleged by critics of the newly announced weapons.

### Escalate to de-escalate

The concept of escalate to de-escalate has been a driving factor for U.S. nonstrategic and low-yield nuclear weapons development for nearly the last decade. Since its 2015 coining, the United States has been forced to consider whether or not Russia would utilize this tactic if it is not explicitly outlined in their military doctrine. With the beginning of the conflict in Ukraine, the conversation has been reinvigorated yet again with the introduction of the nuclear element in statements by Vladimir Putin. While there has been no documented movement which would indicate the potential for nuclear weapons use in the conflict yet, top intelligence officials in the U.S. are still wary of the temptation that low-yield nuclear weapons could provide in the event that Putin would see a shift in the conflict that did not align with the objectives of his operation.

However, to address the dangers of the escalate to de-escalate doctrine, it is important to note that the U.S. response to the concept is equally de-stabilizing and is another driving factor in the crumbling of the global security architecture. U.S. perception of the threat of Russian nonstrategic nuclear weapons was a driving factor in weapons development plans, and these plans which rely on flexible response do not contribute to deterrence strategy the way they are intended. Later chapters will discuss escalate to de-escalate further.

### The U.S. posture in summary

The United States nonstrategic and low-yield nuclear arsenal lacks the variety of its Russian counterpart, but the role of these deployments in U.S. strategy still poses a significant blockade to progress in negotiating a meaningful bilateral agreement which could address low-yield or nonstrategic nuclear weapons. The United States created the predecessors of these weapons in the Cold War, and its practices of nuclear sharing in Europe are a

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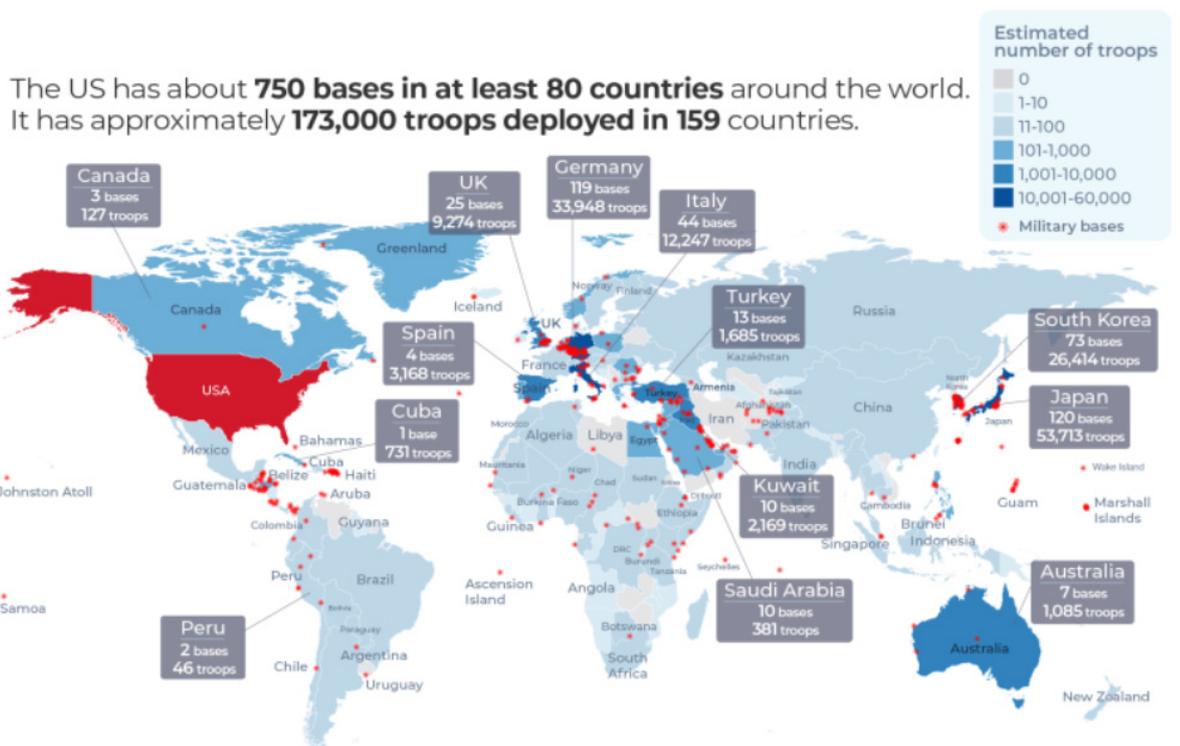
<sup>38</sup> Ibid.



significant driving force behind why they have gone unaddressed in arms control treaties to date. The United States has directly and markedly contributed to lowering the nuclear threshold with its nuclear weapons developments. The U.S. justification that low-yield weapons are needed to counter potential Russian aggression does not alter the reality that U.S. policies also contribute to a dynamic that threatens to weaken strategic stability.

The most important takeaways from low-yield nuclear weapon policy in the United States are that low-yield weapons were a U.S. initiative to avoid immediate escalation to hydrogen bombs, but in introducing the concept of limited nuclear war the United States opened the door to concepts in military strategy and foreign policy which analysts struggle to address decades later. The United States holds itself to a high standard – it is the responsible party in maintaining a nonstrategic nuclear force (outside its sovereign territory) in the name of a strategic alliance with NATO, and the 2018 Nuclear Posture Review lines the U.S. up as protecting its allies and partners from the dangers of nuclear escalation or coercion through its flexible response developments.

However, the maintenance and improvement of its low-yield and nonstrategic forces may pose a threat to greater strategic stability, especially when their developments challenge the foreign policy goals and interests valued by the Russian Federation.



U.S. military presence around the world as of 2020

Source: www.aljazeera.com

## RUSSIAN NUCLEAR FORCES AND THE LOW-YIELD OPTION

### Historical development in context

For decades, scholars and historians have pored over Soviet-era military documents in order to analyze every choice that was made, repeatedly crafting dialogues to explain what the decision-making process must have been. However, these attempts to categorize Soviet decision-making oversimplify the complex reality of Soviet doctrine in ways that will not be attempted here. Using available information, this analysis will seek to identify potentially relevant historical events leading to the development of low-yield nuclear weapons and follow how these decisions impacted strategic stability.

The Soviet Union made their decision to look into the concept of limited nuclear war after they identified it as a potential problem from the United States. The beginning of the Russian low-yield nuclear weapon development was in response to the U.S. *flexible response* doctrine, which aimed to replace the *massive retaliation* plan the U.S. had maintained from the 1950s. According to Edward L. Warner III, after the idea of a limited nuclear war was introduced, Marshal V. D. Sokolovskiy, a former chief of the General Staff and prominent military theorist, explicitly condemned the concept and sought to avoid it at all costs. However, the seed had been planted and in the 1960s military writers and even Sokolovskiy himself began to hint at the possibility of limited theater war, outlining operations which would use conventional means as well as limited use of nuclear forces on in one or select operations.<sup>39</sup> Warner explained that throughout their stringent opposition to the concept of a limited nuclear war, the Soviets became familiar with all relevant, Western concepts pertaining to it including different concepts for limitation.

Before that widespread consideration of limited nuclear war as a concept, the Soviet Union had already determined it could not find a feasible option where use of an offensive nuclear strike could be beneficial for their political goals. Due to the inherent and understood widespread destruction guaranteed in a nuclear conflict, the debate was centered around if any nuclear war could be accepted as a continuation of politics without also preventing socialism's *final victory*.<sup>40</sup> For that reason, on behalf of the then Soviet leader Leonid I. Brezhnev, an announcement was made on

<sup>39</sup> Warner E. L. (1989) Soviet Concepts and Capabilities for Limited Nuclear War: What We Know and How We Know It RAND Corporation, Retrieved June 10, 2022 from <https://apps.dtic.mil/sti/pdfs/ADA208308.pdf>

<sup>40</sup> Pike, J. (n.d.). Nuclear weapons. Nuclear Weapons - Russian / Soviet Nuclear Forces. Retrieved June 10, 2022, from <https://nuke.fas.org/guide/russia/nuke/#:~:text=In%20the%201960s%2C%20the%20Soviet,supersonic%20fighters%20and%20attack%20aircraft>



June 16<sup>th</sup>, 1982 by then foreign minister Andrei A. Gromyko that the Soviet Union would not be the first to use nuclear weapons.<sup>41</sup> However, even with this pledge to the United Nations, the Soviet Union was already on the track to develop low-yield weaponry.

After the death of Stalin, who was opposed to public discussion of strategy using nuclear weapons, the Soviet Union began developing a variety of new applications for nuclear engagement. According to the Federation of American Scientists:

In the 1960s, the Soviet Union launched R&D to miniaturize and improve reliability of nuclear weapons. Air Force tactical units began receiving new, smaller nuclear bombs, which could be carried by supersonic fighters and attack aircraft. Nuclear depth charges were also developed for use against submarines, including those operating under the ice cap. Development activities included strategic systems for the Navy; cruise missiles, aviation bombs and artillery projectiles [the smallest nuclear charge was developed for a 152mm artillery projectile].<sup>42</sup>

These developments occurred synchronously with U.S. developments of battlefield nuclear weapons, and reinforced support that the Soviet Union had to be prepared for any conflict with the United States. Considering these enhancements to the Russian nuclear arsenal, “qualitative technological advancements and R&D efforts were largely conditioned by competition with the U.S. and, in the eyes of the Soviets, were reactive and imitative in most instances.”<sup>43</sup> Interviews with Soviet General Staff officers revealed that while the Soviet Union made necessary decisions and developments to maximize the political use of nuclear weapons, the command understood the implications of nuclear war if it were to break out, thus he sought to avoid a nuclear conflict at all costs.<sup>44</sup>

Though command had made it clear they sought to avoid nuclear conflict, decisions made by the Russian Federation after the collapse

<sup>41</sup> Goshko, J. M. (1982, June 16). Soviet chief renounces first use of A-weapons. The Washington Post. Retrieved June 10, 2022, from <https://www.washingtonpost.com/archive/politics/1982/06/16/soviet-chief-renounces-first-use-of-a-weapons/69fde24a-b92c-4bba-b253-4693dfbda9f7/>

<sup>42</sup> Pike (n.d.). Nuclear weapons. Retrieved June 10, 2022, from <https://nuke.fas.org/guide/russia/nuke/#:~:text=In%20the%201960s%2C%20the%20Soviet,supersonic%20fighters%20and%20attack%20aircraft>

<sup>43</sup> Hines, J. C., Mishulovich, E. M., & Shull, J. F. (1995). Soviet intentions, 1965-1985. BDM Federal.

<sup>44</sup> Ibid.

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of the Soviet Union opened the door to conversations about the reliability of that sentiment. The No First Use guarantee made by the Soviet Union in 1982, which was already under question by NATO officials due to military records obtained by Germany, was officially terminated by Russia in 1993. This development came as more of a political statement – Stephen Meyer, a Russian military specialist from MIT, claimed “No one there or here ever had a *no first use policy*,” and that “only very naive people ever believed that. It doesn’t mean any change in operations, in readiness, in technology, targeting. It’s just a very practical statement for a country that now has few other ways of warning off attacks on its territory.”<sup>45</sup> Regardless of its actual impact on policy, the statement was a change in posture that reflected similar approaches to U.S. policy, which never adopted any No First Use policies.

The removal of the Russian No First Use pledge, even if only symbolic and not operationally significant, opened the conversation to fears of first use by the superpower. However, the weapons in the Russian arsenal were no longer serving the same purpose as they had within Soviet nuclear strategy. While the aims of the Soviet Union were to avoid nuclear war, the strategic function of their nuclear weapons were to be superior to the U.S. weapons and, if a potential nuclear war were to break out, *win* any conflict – with decisions going so far as to make provisions for nuclear conflict such as bunkers to protect political leaders.<sup>46</sup> However, the defensive shift borne from this transition in policy shaped the ongoing debate on fear of nuclear use for nearly two decades.

By 2000, for the Russian Federation nuclear weapons had shifted from being powerful weapons with little political use, other than to come out on top if the U.S. and Russia were to ram horns, to being defensive weapons used to deter enemy aggression under threat of severe retaliation. This deterrence posture was meant to apply to a range of circumstances, as Russia outlined specific instances and/or scenarios which warranted nuclear response. This is common practice, where a published nuclear doctrine with moderately ambiguous terms for use allows for broad interpretations of escalation scenarios and prevents conflict. After Russia’s renouncement of the No First Use pledge inherited by the Soviet Union, it established concerning, new legal precedents which opened the doors for nuclear use in terrifying new ways.

The Russian nuclear doctrine of 2000 included a section outlining situations where it reserved the right to use nuclear weapons as “in response to the use of nuclear and other types of weapons of mass destruction against it and (or) its allies, as well as in response to large-scale aggression utilizing conventional

<sup>45</sup> Schmemmann, S. (1993, November 4). Russia drops pledge of no first use of Atom Arms. The New York Times. Retrieved June 10, 2022, from <https://www.nytimes.com/1993/11/04/world/russia-drops-pledge-of-no-first-use-of-atom-arms.html>

<sup>46</sup> Hines, J. C., Mishulovich, E. M., & Shull, J. F. (1995). Soviet intentions, 1965-1985. BDM Federal.



weapons in situations critical to the national security of the Russian Federation.”<sup>47</sup> Creating the opportunity to respond with nuclear force to conventional threats allowed for justification of a first-use scenario, at least according to Russian national security doctrine, and opened the question of what Russia determined to be “critical to the national security of the Russian Federation.” This policy was the birth of the U.S. perception of the Russian *escalate to de-escalate* strategy – which saw some U.S. officials determine that Russia could potentially utilize a theater nuclear explosion in some capacity to escalate a conflict in its periphery and prevent interference from other major powers while simultaneously making it easier to attain the desired outcome from the conflict utilizing this threat of force. A key contention point is what leaders would perceive to be critical to national security – future documents published attempted to clarify doctrine, but military actions have also deviated from those guidelines.

Russian threat perception pointed them in the direction for the significant change in doctrine, which is referenced in the Ministry of Defense publication *Urgent Tasks for the Development of the Armed Forces of the Russian Federation* from 2003. The document, colloquially known as the *Ivanov Doctrine*, redefined the threat posed by NATO and justified the change in policy to allow a nuclear response to a conventional threat by stating that “This decision was dictated by the fact that the... United States [was] seriously preparing for lowering the threshold for the use of nuclear weapons.”<sup>48</sup>

Another important factor to consider in Russia’s threat perception is its geographical position. Russia’s geographical advantages are vastly different from that of the United States, which is afforded significant security buffers by its natural borders. The differences create incentives for Russia to consider nonstrategic nuclear weapons as a potentially useful option against potential threats in its periphery. Russian geopolitical advantages are centered in its size, but the fact that it is bordered by fourteen nations provides them with significantly different security concerns from those faced by the United States. Russian history is rife with examples of border conflicts, as patterns of conflict arose in post-Soviet spaces, being areas with significant Russian cultural and political heritage. Russia has been involved in numerous conflicts in its periphery, an issue which the United States does not face with its natural geographic advantage.

Each of these factors contributes significantly to modern

<sup>47</sup> Arms Control Association. (n.d.). Russia’s Military Doctrine. Arms Control Association. Retrieved June 10, 2022, from <https://www.armscontrol.org/act/2000-05/russias-military-doctrine>

<sup>48</sup> Schneider, M. B. (2013, March 15). The Nuclear Weapons Policy of the Russian Federation. Washington D.C.; Executive Services Directorate. Retrieved from [https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Science\\_and\\_Technology/06-F-0446\\_DOC\\_10\\_The\\_Nuclear\\_Weapons\\_Policy\\_of\\_the\\_Russian\\_Federation.pdf](https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Science_and_Technology/06-F-0446_DOC_10_The_Nuclear_Weapons_Policy_of_the_Russian_Federation.pdf)

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developments in the Russian nonstrategic nuclear arsenal and paints an important picture of the context for Russian low-yield weapons development. Throughout its nuclear history, Russian threat perception has focused on potential threats from U.S./NATO aggression, while simultaneously using that competitive strategic relationship as a catalyst for internal military-industrial decisions to ramp up R&D on a variety of battlefield nuclear weapons. Using this context, an analysis of recent Russian developments in low-yield nuclear weapons will help to reveal the impact of their development on strategic stability.

### Russian nuclear weapons of interest

This analysis is not meant to act as a weapon-by-weapon critique of the modernization programs currently underway in the Russian Federation. However, it is essential to highlight some specific weapons/systems with concerning implications for strategic stability, particularly when these weapons are designed with low-yield nuclear warheads in mind. Specific weapon systems and missiles of interest include the 9M723K1 missiles deployed on the 9K720 Iskander-M, and the 9M729 ground-launched cruise missile (GLCM), both of which are nuclear-capable missiles and variants of the same system.

The 9K720 Iskander-M is a nuclear-capable short-range ballistic missile system. It is equipped with two 9M723K1 missiles which can use a variety of conventional payloads, but are widely assumed to be dual-capable and could each be fitted with a 5–50kt nuclear warhead.<sup>49</sup> The system is incredibly accurate due to its mixed guidance system, and its missiles are claimed to be impossible to intercept due to their speed and non-ballistic missile trajectory.<sup>50</sup> While the 50kt upper limit of a nuclear-armed 9M723K1 falls outside the boundaries of this analysis' working definition of a low-yield nuclear weapon, its smallest yield lies at one third the strength of the defining limit.

The 9M729 is a long-range, ground-launched cruise missile

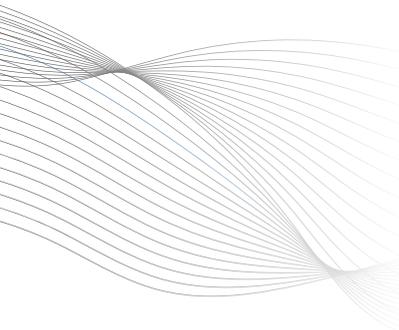
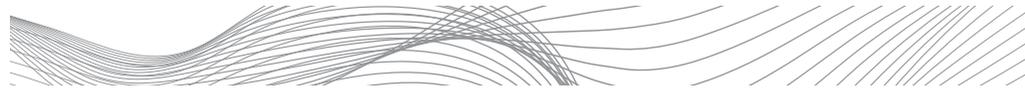


The 9K720 Iskander (NATO: SS-26 Stone) — a road-mobile short-range ballistic missile (SRBM) with a range of up to 500 km

Source: [www.missilethreat.csis.org](http://www.missilethreat.csis.org)

<sup>49</sup> Army Recognition (2022, May 20). Iskander Iskander-M 9K720 9P78E 9t250e SS-26 Stone Tactical Ballistic Missile Data. Defense News security global military army equipment technology industry - Army Recognition. Retrieved June 10, 2022, from [https://www.armyrecognition.com/russia\\_russian\\_missile\\_system\\_vehicle\\_uk/iskander\\_iskander-m\\_missile\\_9k720\\_9p78e\\_9t250e\\_ss-26\\_stone\\_tactical\\_ballistic\\_missile\\_russian\\_army.html](https://www.armyrecognition.com/russia_russian_missile_system_vehicle_uk/iskander_iskander-m_missile_9k720_9p78e_9t250e_ss-26_stone_tactical_ballistic_missile_russian_army.html)

<sup>50</sup> Пешков, А. (2018, September 13). Удар «Искандера»: кадры пуска ракет на маневрах «Восток-2018». Телеканал «Звезда». Retrieved June 10, 2022, from <https://tvzvezda.ru/news/201809130956-32h2.htm>



### Statistics on nonstrategic and defensive weapons of the Russian Federation

Source: Bulletin of the Atomic Scientists report United States nuclear weapons, 2022, prepared by Hans M. Kristensen and Matt Korda

(GLCM) recently operationalized by the Russian Federation. It has an alleged range of 2,500km which prompted the U.S. withdrawal from the 1987 INF Treaty in 2019. Sources state that the missile was designed to carry a low-yield nuclear warhead but is dual-capable and can be armed with an approximate 500kg conventional payload. It can also be armed with “cluster, fuel-air explosive, and bunker-busting” warheads.<sup>51</sup> However, even amongst allegations from the U.S. that the missile system was capable of ranges past what the Russian Federation had publicly acknowledged, diplomats from Russia still stated that the 9M729 complied with the INF Treaty’s requirements and requested the United States reduce its counter-productive speculations.<sup>52</sup>

Both of these are widely in use now by the Russian Army, with forces launching Iskander-M SRBM missiles with previously unknown decoy technology into Ukraine as a part of their ongoing conflict.<sup>53</sup> Ukraine also claimed that, as recently as April 24<sup>th</sup>, 2022, the Russian federation had allegedly deployed two Iskander-M mobile launchers within 40 miles (60km) of Ukraine’s border.<sup>54</sup> The 9M729 GLCM and 9K720 Iskander use launchers which closely

resemble one another but have vastly different ranges, an approximate 2,000km difference.<sup>55</sup> In the current security environment, where there are many questions on the feasibility of use of low-yield nuclear weapons in the ongoing conflict in Ukraine, the deployment of these dual-capable weapon systems, brandishing new and potentially unknown technologies,

Nonstrategic and defensive weapons				
<b>ABM/Air/Coastal defense</b>				
S-300/S-400 (SA-20/SA-21)	~750	1992/2007	1 x low	~290
53T6 Gazelle	68	1986	1 x 10	68 <sup>16</sup>
SSC-1B Sepal (Redut)	8 <sup>17</sup>	1973	1 x 350	4
SSC-5 Stoooge (SS-N-26) (K-300P/3M-55)	60	2015	(1 x 10) <sup>18</sup>	25
<b>Land-based air</b>				
Bombers/fighters (Tu-22M3(M3M)/Su-24M/ Su-34/MIG-31K)	~300	1974–2018	ASMs, ALBM, bombs	~500
<b>Ground-based</b>				
SS-26 Stone SSM (9K720, Iskander-M)	144	2005	1 x 10–100	70 <sup>19</sup>
SSC-7 Southpaw GLCM (R-500/9M728, Iskander-M) <sup>20</sup>				
SSC-8 Screwdriver GLCM (9M729) <sup>21</sup>	20 <sup>22</sup>	2017	1 x 10–100	20
<b>Naval</b>				
Submarines/surface ships/air			LACM, SLCM, ASW, SAM, DB, torpedoes	~935
<b>Subtotal nonstrategic and defensive forces</b>				<b>~1,912<sup>23</sup></b>

<sup>51</sup> Military Today. (n.d.). SSC-8. Military Today. Retrieved June 10, 2022, from [http://www.military-today.com/missiles/ssc\\_x\\_8.htm](http://www.military-today.com/missiles/ssc_x_8.htm)

<sup>52</sup> TASS. (2017, December 21). Russian diplomat rejects US claims new cruise missile fails to comply with INF Treaty. Tass.com. Retrieved June 10, 2022, from [https://tass.com/politics/982316?utm\\_source=google.com&utm\\_medium=organic&utm\\_campaign=google.com&utm\\_referrer=google.com](https://tass.com/politics/982316?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.com)

<sup>53</sup> Ismay, J. (2022, March 15). Russia deploys a mystery munition in Ukraine. The New York Times. Retrieved June 10, 2022, from <https://www.nytimes.com/2022/03/14/us/russia-ukraine-weapons-decoy.html>

<sup>54</sup> Mallard, W. (Ed.). (2022, April 24). Ukraine says Russia deploys Iskander-M launchers near border. Reuters. Retrieved June 10, 2022, from <https://www.reuters.com/world/europe/ukraine-says-russia-deploys-iskander-m-launchers-near-border-2022-04-24/>

<sup>55</sup> Missile Defense Project. (2021, August 2). 9K720 Iskander (SS-26). CSIS Missile Defense Project. Retrieved June 10, 2022, from <https://missilethreat.csis.org/missile/ss-26-2/>

<sup>56</sup> Missile Defense Project. (2022, March 31). 9M729 (SSC-8) CSIS Missile Defense Project. Retrieved June 10, 2022, from <https://missilethreat.csis.org/missile/ssc-8-novator-9m729/>

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contributes negatively to strategic stability. With the various warnings issued by President Putin and other Russian officials alongside moves to raise the readiness level of the deterrent forces of the Russian Federation, to utilize dual-capable technologies invites misperception, miscommunication, and the potential for skewed response.

### Russian compellence in the 21<sup>st</sup> century

Since the dissolution of the Soviet Union, Russia has maintained various relationships within the post-Soviet space in the nation's periphery. The Russian Federation's relations with the near abroad can be defined as attempted maintenance of not only its cultural and economic ties, but political and military ones as well. Considering the vast array of ethnic and cultural ties that were established throughout the existence of the Soviet Union and even before, it is of little surprise that the separation of post-Soviet spaces along established border lines created some dissenting opinions and a slew of separatist movements, some of which the Russian Federation has supported over the past three decades.

Russian engagement with some of the former Soviet republics has been supportive in some situations to pro-Russian separatists in its periphery. Some critics of Russian foreign policy in its near abroad have claimed that the nation intentionally fosters instability in its periphery to maintain control over the economic sphere and ensure the dependence of those spaces while simultaneously preventing Western influence on its doorstep.<sup>57</sup> These critics have outlined how limited use of force has been a staple in Russia's strategy of compellence/coercive diplomacy, going so far as to outline the essential elements of limited force utilized within Russian demonstrative coercion. In the context of Russian activities related to coercive diplomacy in Ukraine before 2022, one critic outlined the three core elements of Russian limited use of force being:

- (1) Large-scale military exercises near Ukraine's border to increase concern of a Russian military movement.
- (2) The use of non-state actors (NSA), including organized crime figures, supported and directed by Moscow to give the appearance of a local rebellion. This included mercenaries and ideologically motivated volunteers – fostered by a nationalistic Slavic narrative propagated by Russia.
- (3) Limited direct injections of

<sup>57</sup> Mendel, I. (2021, October 19). Russia is the world's leading exporter of instability. Atlantic Council. Retrieved June 10, 2022, from <https://www.atlanticcouncil.org/blogs/ukrainealert/russia-is-the-worlds-leading-exporter-of-instability/>



The presidential rally celebrating the re-election of President Vladimir Putin, March 18th, 2018

Source: taken by the author

Russian units and troops in the form of Battalion Tactical Groups (BTG's, *batalonnye takticheskiye gruppy*), separate from the intelligence and Spetsnaz advisors training and advising local political and military leaders, to stop Ukrainian military advances.<sup>58</sup>

The 2014 accession of Crimea was hailed as the reclamation of historically Russian land by Russian political spheres, going so far as being celebrated, or at minimum acknowledged in a celebratory manner, at the 2018 presidential election. Russia, Sevastopol, and Crimea were listed in the background throughout the performances and speeches celebrating the re-election of President Vladimir Putin. However, the accession of Crimea created a significant rift between Russia and the West, and launched an ongoing conflict between the Russian Federation and Ukraine over territories in eastern Ukraine and Crimea. This longstanding conflict recently broke out into full-blown military confrontation on February 24<sup>th</sup>, 2022, as Russian president Vladimir Putin gave the address *On conducting a special military operation* in a televised speech. On June 9<sup>th</sup>, President Putin gave another address, defending the actions of Peter the Great returning culturally or historically Russian lands to Russia where he compared himself to the historic Russian leader.<sup>59</sup> In the example of returning land from Sweden, he highlighted the concept of returning and strengthening, and that the land that St. Petersburg was built on was seen as European land.<sup>60</sup> Putin's speech has the potential to raise concerns about his intentions in post-Soviet spaces, as he ended the address by stating "судя по всему, на нашу долю тоже выпало возвращать и укреплять" or "it is [Russia's] destiny to return and strengthen."<sup>61</sup>

While other examples of Russian activity in its periphery are examples of Russia maintaining control over its near abroad, the best example of Russian compellence in the 21<sup>st</sup> century is the recent conflict in Ukraine. The initial placement of troops by Ukrainian borders could be classified as coercive diplomacy, but when Russia did not receive the diplomatic concessions it sought, the effort transitioned into a military operation. The beginning of the conflict was accompanied by an overt use of nuclear threats. When President Putin threatened to retaliate with "consequences greater than any you have faced in history" in the event of any third-party interference in its invasion of Ukraine, this

<sup>58</sup> Bowen, A. S. (2017). Coercive diplomacy and the Donbas: Explaining Russian strategy in Eastern Ukraine. *Journal of Strategic Studies*, 42(3-4), 312-343. <https://doi.org/10.1080/01402390.2017.1413550>

<sup>59</sup> Office of the President of Russia, & Putin, V., Meeting with young entrepreneurs, engineers and scientists (2022). Retrieved June 10, 2022, from <http://www.kremlin.ru/events/president/news/68606>.

<sup>60</sup> Ibid.

<sup>61</sup> Ibid.

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seemed to blend deterrent and compellent goals.<sup>62</sup> While an example of a deterrent message to Western power, Russian threats and activities can also be classified as coercion as it aimed to reduce the scope of Ukraine's options in response. The goal was both to force Ukrainian officials to see limits on their options and to make foreign parties consider the implications of aligning themselves militarily with Ukraine.

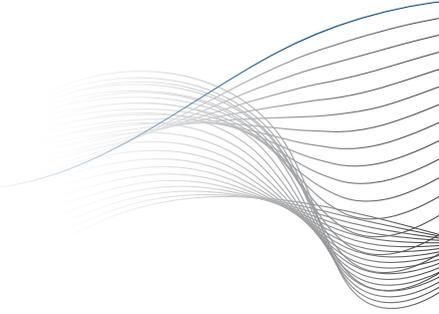
The use of coercion is consistent with the Stability-Instability Paradox, which holds that stability at the strategic level makes it feel safer for states to use force at lower levels. Russia has, since the collapse of the Soviet Union, operated in ways that take advantage of this paradox. This is reflected in Russian involvement in various near abroad conflicts including Nagorno-Karabakh, Transdniestria, Abkhazia, South Ossetia, Crimea, and most recently in Eastern Ukraine. Russia's efforts at coercion in the most recent conflict in Ukraine show a concerning timeline of escalation. Before the February 24<sup>th</sup> speech, Russia had claimed that U.S. warnings of a pending invasion were evidence of hysteria from U.S. intelligence, but the February 27<sup>th</sup> announcement of Russia raising their deterrent forces to higher condition of alert provided evidence that Russia was willing to threaten the use of nuclear weaponry to create space to conduct military operations below the nuclear level.<sup>63, 64</sup> In itself, this use of nuclear threats is sufficiently dangerous to be deemed a negative impact on strategic stability, but it also raises the essential question of how the U.S. or NATO would respond to such actions, opening up possibilities for dangerous but possible responses from the United States or NATO.

Overall, the acts of compellence are identifiable in how Russia has not only limited decisions of its adversaries, but also forced many of the states in the post-Soviet spaces to frame their relationship with Russia around maintaining a mutually beneficial relationship rather than pursue other interests. Thus, when states move in a direction opposite of what Russia wants to maintain in its periphery, they become a target of Russian compellence or, eventually, action. While compellence can be through policy, force, or a mixture of both, all Russian actions of compellence, combined with the implicit threats of nuclear use and narrative on returning land to Russia, force the consideration of how Russian policy will develop moving forwards potentially using threats of nonstrategic

<sup>62</sup> McCammon, S., Hodges, L., & Intagliata, C. (2022, March 8). Putin has threatened nuclear action. here's what Russia is actually capable of. NPR. Retrieved June 10, 2022, from <https://www.npr.org/2022/03/08/1085248170/putin-has-threatened-to-use-his-nuclear-arsenal-heres-what-its-actually-capable->

<sup>63</sup> Lawder, D., & Polityuk, P. (2022, February 14). U.S. says Russia may create pretext to attack Ukraine. Reuters. Retrieved June 10, 2022, from <https://www.reuters.com/world/europe/us-says-diplomacy-still-open-end-ukraine-standoff-with-russia-2022-02-13/>

<sup>64</sup> Auyezov, O. (2022, February 27). Russia's Putin puts nuclear forces on high alert. Reuters. Retrieved June 10, 2022, from <https://www.reuters.com/world/europe/russias-putin-puts-nuclear-forces-high-alert-2022-02-27/>



The goal was both to force Ukrainian officials to see limits on their options and to make foreign parties consider the implications of aligning themselves militarily with Ukraine



nuclear weapons to cement military objectives. Low-yield nuclear weapons specifically are a topic of concern in these situations due to the fact that, according to analysts, possession of a lower-yield option invites increased consideration for use in conflict by lowering the threshold for nuclear war.<sup>65</sup> It will be critical to see how Russian use of compellence, based on the threat of nuclear weapons use, continues in the ongoing conflict in Ukraine and if the nation would continue the pattern threatening other nations in its periphery.

## Russian nuclear policies in 2022

The most recent military doctrine of the Russian Federation, being officially adopted in the state, was released on December 30<sup>th</sup>, 2014.<sup>66</sup> Three years after that publication, President Vladimir Putin signed the *Fundamentals of the State Policy of the Russian Federation in the Field of Naval Operations for the Period Until 2030* on July 20, 2017, and nearly six years later, on June 2<sup>nd</sup>, 2020, Russia published *Basic Principles of the State Policy of the Russian Federation on Nuclear Deterrence*, which was a significant update on the deterrence policy of the nation.<sup>67</sup> While not an update in the state's military doctrine, the latter documents marked a change in policy from previous publications; while beneficial for the concept of arms control by increasing transparency of nuclear doctrine, they illuminated the potential scenarios for nuclear escalation and/or response. In these publications, Russia highlighted the defensive nature of their nuclear weapons. However, in practice, Russian threats of nuclear weapon use have not been to prevent military conflicts using nuclear weapons, but rather to protect their interests in ongoing conventional conflicts, and there were sections in both documents which foreshadowed the military actions and decisions made regarding Russia's actions in Ukraine.

While it did introduce levels of non-nuclear deterrence, utilizing alternative forms of deterrence to potentially reduce reliance on nuclear weapons, the official military doctrine from 2014 specifies that the main tasks of the military of the Russian Federation are to, per Section 21.c, maintain *global and regional stability and a sufficient level of nuclear deterrence* and that nuclear weapons, per Section 16, are an important factor in *preventing the outbreak of nuclear military conflicts and military conflicts using conventional*

<sup>65</sup> Physicians for Social Responsibility. (2019, June 11). FACT SHEET ON "LOW-YIELD" NUCLEAR WEAPONS. Physicians for Social Responsibility. Retrieved June 11, 2022, from <https://www.psr.org/wp-content/uploads/2019/06/low-yield-nuclear-weapons-fact-sheet.pdf>

<sup>66</sup> Российская газета. (2014, December 30). Военная доктрина Российской Федерации. Российская газета. Retrieved June 10, 2022, from <https://rg.ru/documents/2014/12/30/doktrina-dok.html>

<sup>67</sup> Putin, V. (2020, June 2). Указ Президента Российской Федерации от 02.06.2020 г. № 355. Президент России. Retrieved June 10, 2022, from <http://kremlin.ru/acts/bank/45562>

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weapons which would apply to both large-scale and regional war.<sup>68</sup> This document set the stage for concerns about Russian nuclear use in response to a conventional regional war, and these concerns were amplified in subsequent publications.

In the *Fundamentals of the State Policy of the Russian Federation in the Field of Naval Operations for the Period Until 2030*, Section 37 states that in the event of a military escalation that *demonstration of readiness and determination to employ nonstrategic nuclear weapons capabilities is an effective deterrent*.<sup>69</sup> This section signals readiness to utilize nonstrategic nuclear weapons as a deterrent method in the event of hostilities, but even with that policy outlined it could still be interpreted in a defensive manner as it only seeks to deter further aggression. It was not until specific phrasing was published in *Principles of the State Policy of the Russian Federation on Nuclear Deterrence* that the nonstrategic nuclear weapons in Russian policy were both defensive and offensive in nature.

Section I Article IV of the updated policy for Russian nuclear deterrence outlines the main usage of nuclear weapons in Russian policy, stating:

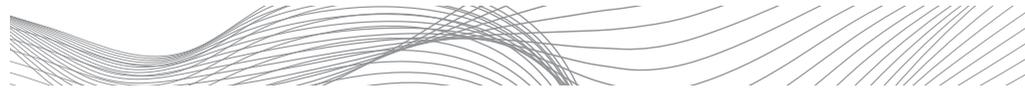
“The state policy in the field of nuclear deterrence is defensive in nature, aimed at maintaining the potential of nuclear forces at a level sufficient to ensure nuclear deterrence, and guarantees the protection of the sovereignty and territorial integrity of the state, deterring a potential adversary from aggression against the Russian Federation and (or) its allies , and in the event of a military conflict, preventing the escalation of hostilities and their termination on terms acceptable to the Russian Federation and (or) its allies.”<sup>70</sup>

Academics quickly identified the phrasing “on terms acceptable to the Russian Federation” and its potential implications for this new, declared nuclear deterrence as potentially falling in line with Russia’s alleged *escalate-to-de-escalate* policy. Experts emphasized that it seemed to highlight potential threat and/or use of nuclear weapons in conventional conflict scenarios to protect the interests

<sup>68</sup> Российская газета. (2014, December 30). Военная доктрина Российской Федерации Retrieved June 10, 2022, from <https://rg.ru/documents/2014/12/30/doktrina-dok.html>

<sup>69</sup> Studies Institute, Russia Maritime and Davis, Anna, (2017) *The Fundamentals of the State Policy of the Russian Federation in the Field of Naval Operations for the Period Until 2030*. RMSI Research. 2. Retrieved June 10, 2022 from [https://digital-commons.usnwc.edu/rmsi\\_research/2](https://digital-commons.usnwc.edu/rmsi_research/2)

<sup>70</sup> Putin, V. (2020, June 2). Указ Президента Российской Федерации от 02.06.2020 г. № 355. Президент России. Retrieved June 10, 2022, from <http://kremlin.ru/acts/bank/45562>



Russia is able to use its substantially larger nonstrategic nuclear weapons stockpile to its advantage on the global stage, achieving its military goals while contributing to the degradation of global strategic stability in various ways

of the Russian Federation.<sup>71</sup> Given the implicit threat of nuclear use provided on February 24<sup>th</sup>, 2022 to deter interference in the Russian Federation's special military operation in Ukraine, there is tangible evidence Russia considers the threat of nuclear use as a feasible option in its conventional conflicts to protect its non-vital interests.

Critics could counter assertions that these policies are destabilizing by highlighting parallels between these published doctrinal statements and those published/released by the United States, but this is not a critique of one nation over the other. If stipulations for nuclear response against non-nuclear forces are published in the nuclear doctrine of any nuclear weapon possessor, they are directly contributing to the ongoing destabilization of strategic stability. These specific publications are referenced in this analysis as the threat of low-yield nuclear use is at its highest point it has been this century due to the conflict in Ukraine, and an in-depth analysis of the Russian nuclear doctrine is crucial in determining the effects of low-yield weapons on Russian decisions leading up to and during the ongoing conflict.

The Russian Federation has an incredibly powerful arsenal of nonstrategic nuclear weapons, a significant number of them designed to utilize low-yield nuclear warheads, and to-date these weapons have gone unaddressed in arms control agreements. Russia is able to use its substantially larger nonstrategic nuclear weapons stockpile to its advantage on the global stage, achieving its military goals while contributing to the degradation of global strategic stability in various ways.

Knowing the historical backgrounds and current policies of both the United States and the Russian Federation, determining the impact which these decisions had on strategic stability is crucial to understand whether they have had a positive or negative effect. To do so, this paper takes this historical context and considers how low-yield nuclear weapons have impacted strategic stability and the current security environment.

<sup>71</sup> Topychkanov, P. (2020, October 1). Russia's nuclear doctrine moves the focus from non-western threats. SIPRI. Retrieved June 10, 2022, from <https://www.sipri.org/commentary/blog/2020/russias-nuclear-doctrine-moves-focus-non-western-threats>

## THE IMPACT OF LOW-YIELD WEAPONS

Knowing that the United States and Russian Federation have developed both strategic and nonstrategic low-yield nuclear weapons, how can it be determined whether these developments have had a negative impact on strategic stability? Proponents of low-yield weapons development state that rather than lower the nuclear threshold, low-yield weapons will reduce not only the potential damage output by the use of nuclear weapons, but also reduce the likelihood of use once actors realize their adversary has matching capabilities.<sup>72</sup> In a 2000 report on nuclear weapons in the 21st century, one analyst proposed that low-yield weaponry could be beneficial to arms control agreements and could lower maintenance costs.<sup>73</sup> By all accounts, those who support this belief have a strong case about the contribution of low-yield weapons to deterrence, as no nations to date have utilized a low-yield weapon in a military engagement or made an example by detonating a weapon as a show of strength.

This argument contributes towards the validity of low-yield weaponry as beneficial to strategic stability by supporting a traditional statement on nuclear weapons: every day nuclear weapons are not used increases the taboo against nuclear use. When applied to this specific analysis, each day we confirm the lack of use of low-yield nuclear weapons in a conflict scenario strengthens the taboo against their use, especially in a conflict in a situation where scholars have theorized it is most likely to be utilized. Even the President of the United States, in a written op-ed through the New York Times, stated that the United States sees no indications that Russia intends to utilize nuclear weapons in Ukraine.<sup>74</sup> This is in line with statements from Russian ambassador to the United Kingdom Andrei Kelin, which contained specific references showing he did not believe that Russia would utilize tactical nuclear weapons in the conflict against Ukraine.<sup>75</sup> The ambassador specifically outlined conditions for nuclear use, stating that Russia has strict provisions on use of tactical weapons limiting them to situations “mainly when the existence of the state is endangered.”<sup>76</sup>

This evidence seems to suggest that low-yield weapons could be beneficial for strategic stability, or at least not a negative

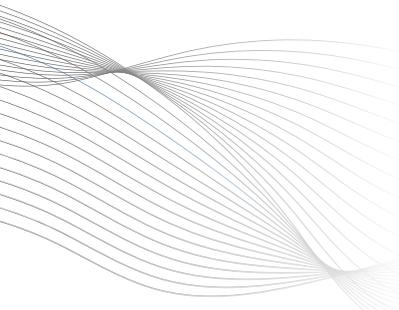
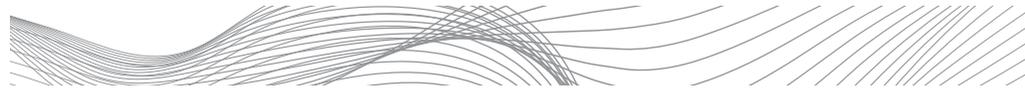
<sup>72</sup> Williams, D., & Lowther, A. B. (2021, April 12). Lower-yield weapons will raise, not lower, the threshold for nuclear use. *Defense One*. Retrieved June 10, 2022, from <https://www.defenseone.com/ideas/2017/08/lower-yield-weapons-will-raise-not-lower-threshold-nuclear-use/140610/>

<sup>73</sup> Younger, S. M. (2000, June 7). Nuclear Weapons in the Twenty-First Century. Nuclear weapons in the twenty-first century. Retrieved June 10, 2022, from <https://nuke.fas.org/guide/usa/doctrine/doe/younger.htm>

<sup>74</sup> Biden, J. R. (2022, May 31). President Biden: What America will and will not do in Ukraine. *The New York Times*. Retrieved June 10, 2022, from <https://www.nytimes.com/2022/05/31/opinion/biden-ukraine-strategy.html>

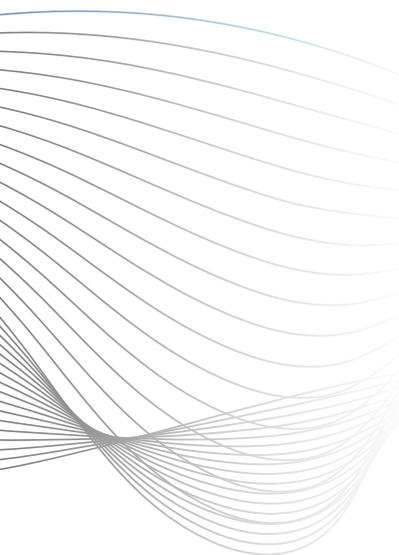
<sup>75</sup> Rosenberg, S. (2022, May 29). Russia won't use tactical nuclear weapons in Ukraine, says ambassador to UK. *BBC News*. Retrieved June 10, 2022, from <https://www.bbc.com/news/world-europe-61618902>

<sup>76</sup> *Ibid.*



An unarmed Trident II D5 missile launches from the USS Nebraska submarine off the coast of California in 2008

Source: [www.physicstoday.scitation.org](http://www.physicstoday.scitation.org)



influence, and that even when relations are at their lowest between the United States and Russia that low-yield weapons will not pose a greater threat to strategic stability on any level. However, even if low-yield weapons have not been used yet and the current conflict does not seem like it will escalate further, that does not change the fact that low-yield weapons have posed significant threats to strategic stability and their presence in this conflict will inherently pose greater threats as time goes on. The development of low-yield nuclear weapons facilitates the threat of nuclear use and fosters the severe degradation of crisis stability – proven by the fact that, even with the semblance of stability maintained, CIA director William Burns stated, “None of us can take lightly the threat posed by a potential resort to tactical nuclear weapons or low-yield nuclear weapons.”<sup>77</sup>

Newer low-yield nuclear weapons have been operationalized by both the United States and the Russian Federation in the past decade, and we can see the direct impact they have had on the security environment. While both the U.S. and Russia have decried the weapons developments of the other as detrimental to strategic stability by lowering the nuclear threshold, both states refuse to take necessary steps to come to the table and address them. Rather than addressing the security concerns which contribute to their respective policies, both nations continue to cite them as the need for low-yield weaponry and as the background for the continued actions pushing us further from an amicable solution. Repeated calls have been made to address nonstrategic nuclear weapons in future agreements, but there has been no concrete progress on that front. To show how these weapons are detrimental to strategic stability, analyzing how low-yield nuclear weapons affect each aspect of strategic stability (arms race, deterrence, and crisis stability) at each level (state, regional, and global) will demonstrate how these weapons have affected not only the strategic stability between the United States and Russia, but strategic stability overall. However, it is important to note that to change the level of strategic stability the development and operationalization of low-yield nuclear weapons must only affect one of the three sub-categories (arms race stability, deterrence stability, and crisis stability) in order to have an impact on the general level of strategic stability. The analysis provided below will frame developments in each of these aspects as they relate to the current security environment, tying current events to the development and deployment of low-yield weapons to show the impact they have had.

<sup>77</sup> Litwak, R. S. (2022, May 3). Russia’s nuclear threats recast Cold War Dangers: The “Delicate balance of terror” revisited. Wilson Center. Retrieved June 10, 2022, from <https://www.wilsoncenter.org/article/russias-nuclear-threats-recast-cold-war-dangers-delicate-balance-terror-revisited>

### Between the United States and Russian Federation

The most direct interpretation, strategic stability between two states directly relates to the balance of incentives, or lack thereof, to initiate conflict or a first-strike against an adversary. Low-yield weapons were developed by these states to counter the actions of the other, providing or denying advantages in different potential military initiatives. There has been a sharp decline in U.S.-Russian relations for the greater part of the past decade, with each side criticizing the military activities of the other. Has the increased development and deployment of low-yield nuclear weapons contributed to this deterioration?

Regarding arms race stability, a common criticism of low-yield weapons is how they are actively contributing to a new U.S.-Russian arms race. From the inception of the concepts of limited war and flexible response, developments in low-yield technology have encouraged creative designs for low-yield nuclear use. While the end of the Cold War saw the destruction of most of those systems, the sentiment of needing to match one another has never disappeared from either nation's military complex. Government officials in the U.S. support the constant tit-for-tat development of the low-yield nuclear arms race, with some representatives emphasizing their deterrent qualities. Franklin C. Miller, principal of the Scowcroft Group, stated in front of the House Armed Services Committee, that "Russian low-yield weapons are designed to implement a Russian strategy of use. The low-yield Trident that the NPR calls for is designed to prevent the Russians from reaching for that low-yield nuclear weapon and using it in the field."<sup>78</sup> In the same session, he claimed that Russian leadership believed there was tactical utility in low-yield weapons, defending U.S. development of similar capabilities. While proponents like Mr. Miller defend the development of new weapons as part of the cycle of modernization rather than an expansion of capabilities, the reality is that it is potential adversaries' perceptions of these developments which determine if it could result in an arms race; even if programs like the B61-LEP are designed to replace aging systems, an arms race will occur if a nation feels the strategic need to respond in kind to new perceived threats.

In addition to other strictly low-yield implications, the Russian development of the 9M729 GLCM, the dual-use cruise missile designed to carry a low-yield nuclear weapon, not only prompted U.S. withdrawal from the 1987 INF Treaty but also established the basis for U.S. research into its own "conventional, ground-launched, intermediate-range missile systems."<sup>79</sup> While the

<sup>78</sup> House Armed Services, & Smith, A., *Outside Perspectives on Nuclear Deterrence Policy and Posture Update* (2019). House Armed Services Committee. Retrieved June 11, 2022, from <https://www.govinfo.gov/content/pkg/CHRG-116hhrg36235/html/CHRG-116hhrg36235.htm>

<sup>79</sup> Office of the Secretary of Defense, *2018 Nuclear Posture Review* (2018). U.S. De-



capacity for research was allowed under the INF, the flight testing of such a weapon would commit the U.S. away from its obligations of the treaty and make it more difficult to bring both parties back to the table. Russia's deployment of the 9M729 GLCM violated the INF Treaty, and the Trump Administration's response to pull out of the agreement all but confirmed that there will be further development of weapons of that same capacity moving forwards. With the INF no longer restricting either party, both Russia and the United States are free to develop nuclear or conventional ground-launched ballistic and cruise missiles with ranges of 500 to 5,500 kilometers, and this shift in limitations puts Europe at risk for the deployment of advanced new technologies. The U.S. and Russia, in their attempts to match each other tit-for-tat in low-yield capabilities and their mutual abandonment of the INF Treaty, have launched themselves into a new nuclear arms race with each party scrambling to develop dangerous new technologies.

Those who discuss the necessity for capability matching, either in an attempt to maintain stability or in search of superiority, echo dangerous sentiments which change public perception to defend their push for development. Proponents of low-yield nuclear development rely on changing public perception, shifting the conversation to create an environment of fear, to support their foreign policy goals. Mr. Miller used Russia *reaching for* low-yield weapons in his statement, and in his attempt to defend low-yield weapons as a feasible response it could change public perception of both crisis and deterrence stability regarding these weapons.

Deterrence stability requires a serious re-analysis due to the current state of global affairs and how low-yield weapons have changed, or not changed, the outcomes of current events. The ongoing conflict in Ukraine has raised significant questions and changed public perception about the utility of nuclear weapons, as well as what purpose deterrence really serves for nuclear weapon states. How is deterrence stability affected by the recent conflict in Ukraine? It could be argued that deterrence is alive and thriving between the U.S. and Russia, proven by Russia's raising of deterrent forces to a combat ready status which is an effective use of the concept. That argument would hold that development of low-yield weapons could be beneficial for deterrence stability, as the U.S. having flexible response options is meant to limit incentives for nuclear escalation. However, the statement that *deterrence stability is within reach when a nuclear-armed state avoids arms racing and correctly presumes that it has sufficient means to deter a conventional war or a nuclear attack* points out exactly why deterrence has failed, heavily contributed by low-yield weapons and their inherent shortcomings.<sup>80</sup>

partment of defense. Retrieved June 10, 2022, from <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

<sup>80</sup> Krepon, M. (2018, July 9). The holy grail of deterrence stability. Arms Control Wonk. Retrieved June 11, 2022, from <https://www.armscontrolwonk.com/archive/1205441/>

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One of the greatest cited rationales for U.S. development of the W76-2 and SLCM in 2018's NPR was to prevent potential regional aggression by the Russian Federation, and that the new weapons it outlined would strengthen U.S. deterrent measures against Russia's perceived advantage in nonstrategic nuclear weapons. But yet, when the time arrived and Russia threatened nuclear use in the event of third-party intervention, the United States was effectively deterred from using its own forces and sought to de-escalate nuclear tensions by not pursuing a tit-for-tat response. The U.S. has gone months without any pronounced response to the Russian nuclear threat – instead maintaining a policy of strategic ambiguity and assuring unacceptable retaliation in some form in the event of Russian incursion into NATO territory. This may have helped persuade Russia not to expand operations outside of Ukraine, but the lack of response in kind might also suggest that the U.S. nuclear threat now lacks credibility and signal to Putin that the United States won't raise the stakes unless it is legally bound to. Former White House Press Secretary Jen Psaki stated that the U.S. would not engage with Russia in its acts of saber rattling to reduce the risk of miscalculation, but if the nation is going to support the ongoing deployment of low-yield weapons for the sake of deterrence, a potential adversary must bare-minimum feel deterred by them.<sup>81</sup> Rather, with Putin knowing the U.S. low-yield arsenal won't be used as a threat, Russia will remain undeterred and may continue similar actions in its periphery after the conclusion of this conflict. Putin recognized that the United States was not likely to risk a nuclear war over a conflict it had no legal stake in, as the United States not only declined to threaten military action over the conflict in Ukraine, but actively stated the U.S. would not support Ukraine militarily.<sup>82</sup> However, preventing Russia from making a decision like what has been seen was a central element of the 2018 Nuclear Posture, so what does that spell out for the success of U.S. tailored deterrence with low-yield nuclear weapons?

Realistically, not only has the United States failed in its goal to deter Russia from making advancements into Ukrainian territory, it has also failed in its goal to make an example of extended U.S. nuclear deterrence as sufficient, which is an enormous risk for arms races which will be addressed later. When considering deterrence stability, it is also important to consider what deterrence has traditionally meant for U.S. and Russia, and now considering what



The statement that *deterrence stability is within reach when a nuclear-armed state avoids arms racing and correctly presumes that it has sufficient means to deter a conventional war or a nuclear attack* points out exactly why deterrence has failed, heavily contributed by low-yield weapons and their inherent shortcomings

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the-holy-grail-of-deterrence-stability/

<sup>81</sup> Psaki J., The White House. (2022, April 20). Press Briefing by Press Secretary Jen Psaki, April 20, 2022. The White House. Retrieved June 11, 2022, from <https://www.whitehouse.gov/briefing-room/press-briefings/2022/04/20/press-briefing-by-press-secretary-jen-psaki-april-20-2022/>.

<sup>82</sup> Finn, T. (2022, February 11). Biden warns Americans in Ukraine to leave, says sending troops to evacuate would be 'World War'. NBCNews.com. Retrieved June 11, 2022, from <https://www.nbcnews.com/politics/white-house/biden-warns-americans-leave-ukraine-russia-troops-world-war-rcna15781>



it has become.

The script of deterrence has been flipped on its head – rather than being a mutually defensive concept to prevent two nuclear states from initiating conflict, Russia is now using its deterrent forces as an offensive measure to protect its gains in conventional conflict. Putin has determined that the saber-rattling of its nuclear forces, something it is emboldened to do with low-yield options, is an acceptable and moreover effective option in support of Russian foreign policy goals. The special military operation and implicit threat of nuclear use in response to interference is evidence that U.S. deterrence failed – Russia determined its operations in Ukraine were significant enough to risk global criticism and pushback, and thus kept NATO and the United States nuclear forces outside of the conflict. This ultimately means that U.S. low-yield nuclear weapons contribute negatively to deterrence stability and the larger concept of strategic stability by not only failing at their outlined goals as listed in the 2018 NPR, but actively increasing odds for the deterioration of other aspects of strategic stability in the process.

However, stepping back from U.S. interests abroad, does this mean that total nuclear deterrence between the U.S. and Russia has deteriorated? Russia has not made any incursions into NATO territory, or declared intent to go to war with the United States, so overall deterrence must still be stable in the traditional sense. But, even with that maintenance of bilateral deterrence stability, a key aspect of U.S. deterrence has failed. With the general discourse on President Putin's February 24<sup>th</sup> threat assuming the use of a low-yield tactical nuclear weapon, deterrence stability was negatively impacted by giving Russia the inherent comfort needed to threaten use of a low-yield weapon over exclusive use of conventional forces against a non-nuclear weapon state, and in U.S. failure to provide extended deterrence to states outside of NATO via newly developed low-yield weaponry.

Concerning crisis stability, on a U.S.-Russian level the risk of conflict has not been this high since the Cold War. Tying in with regional strategic stability, the ongoing conflict in Ukraine is a major threat to crisis stability with red lines being drawn by multiple involved parties, increasing the likelihood for escalation in the event any of them are inadvertently crossed creating a gross miscalculation and response. The reality of the operations currently seen in Ukraine prove that regardless of speculation or assumptions, no analyst can state with assured guarantees that the risk of escalation is zero. In fact, while the use of a nuclear weapon has long been described as a low-probability, high-impact event, the probability for use is likely at its highest point in decades and will take years to reduce back to the levels it was at in the early 2000s.

Issues of dual-use capable missiles with low-yield options also

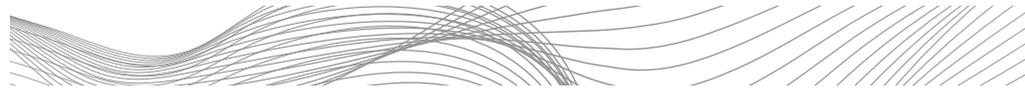
## U.S. AND RUSSIAN LOW-YIELD NUCLEAR WEAPONS: THREATS TO GLOBAL STRATEGIC STABILITY

drastically reduce crisis stability. Firstly, a number of operationalized Russian missile systems are designed with low-yield warheads in mind, but deployed using conventional warheads. A large number of experts have speculated on nuclear use by the Russian Federation in the event of the conflict in Ukraine moving in a direction which would be unfavorable for Putin, and per Russia's published military doctrine this could be a rationale for nuclear use. In the event when a limited nuclear strike could be expected, the repeated use of dual-capable missile systems decreases crisis stability when parties cannot be sure what weapons could be utilized. The United States' deployment of the W76-2 on Trident-II missiles increases the risk for crisis escalation through miscalculation and lack of proportionate response. In the event of a suspected nuclear use against the U.S. or any NATO territories protected under Article 5, should the United States decide to respond with a nuclear strike with any of its Trident-II missiles from its Ohio-class submarines, the recipient would not know whether the warheads onboard will be the 8kt W76-2, the 90kt W76-1, or the 455kt W88.<sup>83</sup> Such a wide variety of responses aboard a single response vehicle, while not dual-capable, invites miscalculation of response and is a primary example of how quickly a limited nuclear war could escalate due to potential miscalculation.

Most importantly, a central factor in the argument against low-yield nuclear weapons for crisis stability is the case that low-yield options provide decision-makers with more incentive to cross the line in the sand. If a state feels that nuclear war is inevitable, low-yield nuclear weapons like the Iskander-M and B61-12 boast dangerous capabilities in accuracy, and a low-yield, high-precision weapon could provide a state with the necessary advantage if it feels one is required. So, as it relates to the current conflict, the deployment of low-yield nuclear weapons provides the United States and Russian officials with a dangerous thought: at what point in national interests would it be acceptable to use a nuclear weapon, or at what point will the adversary find it acceptable, especially when neither state is committed to no first use?

The United States has made no comment on readying its nuclear forces, hinting it does not want to engage in saber-rattling of these weapons, but are certainly making contingency plans behind closed doors for response options in the event of an apparent nuclear strike. Russian decision-makers are likely considering what conditions would use of a nuclear weapon be acceptable, and analysts are concerned that the likelihood of Russian nuclear weapons use in Ukraine is non-zero. However, there is the likely possibility Russia feels minimal pressure to use a nuclear weapon to turn the events of the conflict in their favor with a display of nuclear

<sup>83</sup> Kristensen, H. M., & Korda, M. (2022, May 10). Nuclear notebook: How many nuclear weapons does the United States have in 2022? Bulletin of the Atomic Scientists. Retrieved June 11, 2022, from <https://thebulletin.org/premium/2022-05/nuclear-notebook-how-many-nuclear-weapons-does-the-united-states-have-in-2022/>



Crisis stability is directly impacted by low-yield weapons by providing states with options that are potentially justifiable in the event that escalation seems necessary

capabilities or cement advances that have already been made by their conventional forces because introducing a nuclear weapon into the equation should not benefit their current objectives if this *new deterrence* is stable. Unless there is an incident which would create fear that the U.S. is launching a nuclear weapon, that aspect of crisis stability is not likely to change. However, crisis stability is altered as the ongoing conflict in Ukraine significantly increases opportunity for miscalculation. As operations continue in Ukraine, there is an increasing chance for miscalculation if Russia strikes NATO territory, as Russia has already conducted strikes within 15 miles of the Polish border.<sup>84</sup> The reality of low-yield nuclear weapons is that they inject further instability and uncertainty into acts of brinkmanship and compellence which have already been seen before and since the announcement of Russia's special military operation in Ukraine. Crisis stability is directly impacted by low-yield weapons by providing states with options that are potentially justifiable in the event that escalation seems necessary.

With each of these factors, it can be determined that the development and deployment of low-yield nuclear weapons have had a negative effect by decreasing the strategic stability between the United States and the Russian Federation with a direct influence on arms race stability, deterrent stability, and crisis stability. The relationship between the United States and Russia is abysmal right now, with complete distrust and lack of communication as clear evidence. In this capacity, knowing that strategic stability has been negatively impacted by low-yield nuclear weapons, identifying the issues most likely to pose threats will allow policy-makers to work in any capacity to reduce the risk of further strategic destabilization.

To properly address the dangers low-yield weapons pose, it is important to prioritize which events are high risk, and what steps could be taken to prevent them. Regarding the strategic stability between the U.S. and Russia, while there are many potential threats that low-yield weapons could pose in both short-term and long-term scenarios, the threat posed by a new arms race sparked by U.S. and Russian low-yield nuclear developments is the highest-risk threat to strategic stability due to its potential impact and likelihood over a long-term period. The largest danger from low-yield nuclear weapons in U.S.- Russian strategic stability is the risk of arms race stability completely spiraling, producing a new arms race which could span not only nuclear weapons but also other strategic systems as the fight for superiority in capabilities continues. The effort to modernize low-yield weapon systems in the framework of a new arms race could create incentives for the U.S. and Russia to both develop and deploy more usable nuclear weapons, dangerously changing the potential of nuclear

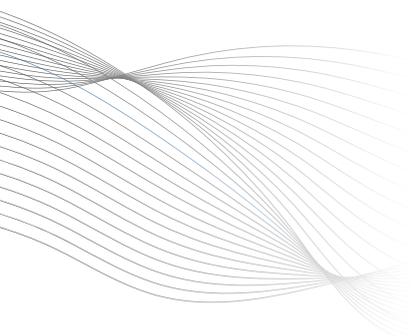
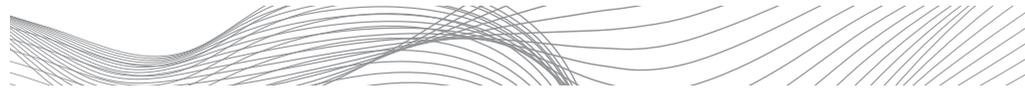
<sup>84</sup> Wilson, A. (2022, March 14). Russian airstrike sends message to NATO. Foreign Policy. Retrieved June 11, 2022, from <https://foreignpolicy.com/2022/03/14/russia-ukraine-military-strike-poland-border-nato/>

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weapons detonation either accidentally or intentionally. Without any legally-binding treaties on nonstrategic nuclear weapons, no discussion on yield-limits in any capacity, and the increasingly clear notion that these weapons may be utilized for exertion of hard political power, an arms race would not only worsen strategic stability but also increase the likelihood of reductions in crisis and deterrence stability.

The other high-value risk which must be addressed is the extremely high danger of crisis escalation between Russia and the United States. The concerns over use of a low-yield nuclear weapon in response to the status of the invasion of Ukraine have been pronounced, and the usage of nuclear weapons as a threat has shifted national policies in ways which may contribute negatively to the ongoing situation as well. NATO territory could increase according to recent announcements as Finland and Sweden, historically neutral nations in the Russia/NATO standoff, have now applied to NATO, which is also a significant case in regional crisis stability as well. With U.S. responsibility to commit to a conflict including any NATO alliance member, unpredictable actions by the Russian military which have capitalized on the Stability-Instability Paradox, and dangerous policies of compellence, crisis escalation is a huge risk in the current security environment. If crisis stability between the U.S. and Russia decreases further, it won't only be those two nations who are caught in the crosshairs – even if one nation initiates a limited nuclear conflict in an attempt to exhibit escalation dominance, there is no guarantee for any nuclear conflict to remain limited.

Deterrence stability, while not the highest ranking on the perceived threats, is still a very dangerous factor in considering the strategic stability between U.S. and Russia. However, while deterrence has certainly been affected by U.S. and Russian deployment of low-yield nuclear weapons, the risk of nuclear deterrence between the two nuclear powers eroding to a point where a first-strike against the other is beneficial is a low-risk scenario. Low-yield nuclear weapons have contributed negatively to deterrence as they have forced reconsideration of how deterrence between nuclear states can work, but it is unlikely to produce a situation where the deterrence between U.S. and Russia erodes to a point where nuclear conflict is likely through a first strike directly against the other. Low-yield nuclear weapons have lowered deterrence stability in regional spheres, but neither the U.S. or Russia is likely to use a low-yield weapon against the other as a primary option. However, if deterrence stability erodes to the point where Russia is emboldened to attack a NATO member in its periphery using a low-yield weapon due to a misperception on U.S. willingness to engage militarily, this low-risk scenario can quickly become a high-risk, higher-impact reality.



## In regional aspects

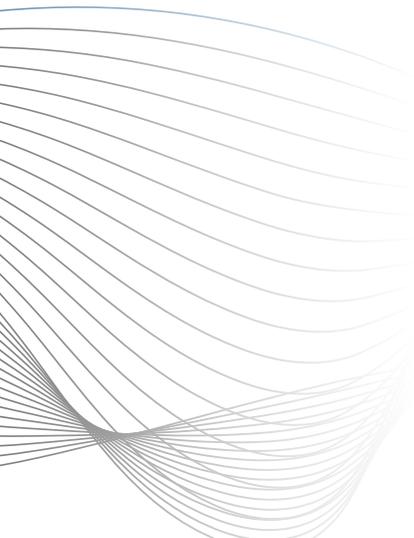
A wider approach is considering how the development and operationalization of low-yield weapons have impacted the strategic stability of regional actors affected by U.S. or Russian weapon systems. While less direct than looking at the stability between two actors, it helps to determine the levels of stability in a region without applying a global lens to the analysis. Considering the low-yield weapons of the United States and Russia, applying this lens means considering how their development and operationalization have impacted the stability in their respective regional zones, or even beyond them due to U.S. nuclear-sharing agreements.

Arms race stability from a regional standpoint is important, as the decisions made by the United States and Russia have opened up possibilities which have been unavailable or not considered feasible by other actors. However, an important distinction to make when considering regional arms race stability is that no actions of regional actors in either U.S. or Russian peripheries are the driving forces behind the potential new arms race.

Russia and the U.S. are not making decisions to develop low-yield nuclear weaponry due to the actions of their neighbors. Rather, low-yield weapons developments by the United States and Russian Federation are largely based off of their strategic relationships; neither the United States or Russia are heavily engaged in arms races spurred by decisions of regional actors in their respective spaces. As it relates to the arms race of low-yield weapons, historically it is shown that a majority of qualitative weapons developments by the U.S. and Russia have been about playing off the strengths of the other.<sup>85</sup> While there are other factors which drive the decision-making processes for each nation, a significant portion of the rationale can be attributed to the action-reaction relationship between the two nations. For example, the U.S. decision to develop the B61-12, and subsequently make it available to non-nuclear weapon states in the event of crises, drew criticism and raised the stakes with the Russian Federation who could perceive this as a direct threat to Russia's interests in Europe. If the Russians decide to develop new nuclear capabilities in response to the B61-12, it will introduce the possibility for a regional arms race fueled by NATO nuclear sharing. However, it is important to note that while this would be relevant for regional stability, that it does not mean that all regional actors have actively contributed to its deterioration. The same relationship is not evident for the regional actors affected by the low-yield nuclear weapons deployed by the United States or in Russia's near abroad. Their decisions, especially if pushed, could reflect boundaries being pushed too far by the nuclear powerhouses in their spheres of influence.

Due to the failure of U.S. extended deterrence, as previously

<sup>85</sup> Hines, J. C., Mishulovich, E. M., & Shull, J. F. (1995). Soviet intentions, 1965-1985. BDM Federal.



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mentioned, states who perceive Russian actions as a potential security threat are likely going to reconsider the practice of relying on security that U.S. extended nuclear deterrence was designed to provide. The same considerations were provided considering U.S. extended deterrence to South Korea when one scholar wrote that “just as America’s nuclear arsenal consisting of thousands of warheads have failed to dissuade and deter Al-Qaeda from committing acts of terrorism, so too has the extended deterrence policy of the United States been ineffectual in deterring North Korea from engaging in limited local provocations and escalating tensions on the peninsula,” as both referenced limited conflict with a nuclear state that existed below the level for interference by the United States.<sup>86</sup> With Russia’s use of nuclear threats backing up its invasion of Ukraine, it proved that Russia could exploit this weakness in extended deterrence policy as well. Putin realized that their engagement in a conflict with Ukraine could escape any military interference or repercussions under the right conditions, which is exactly what the Russian Federation has provided with the implicit threat of low-yield nuclear weapons. Therefore, once these nations realize that the guarantee of extended deterrence is insufficient, one potential risk to regional arms race stability could be the consideration of a state to acquire nuclear weapons.

While not reflected in national policy by any measures, the sentiment was clearly expressed when Ukrainian diplomat Andriy Melnyk suggested that Ukraine would potentially need to reconsider its nuclear-free status if it were unable to join NATO.<sup>87</sup> The comment was given last year, before the context of the Russian invasion or the threats against NATO intervention were given, where the diplomat alluded that nuclear status may have been the only way for Ukraine to protect itself. Since that statement, there has been no tangible evidence that the Ukrainian government was taking any steps towards acquiring nuclear capabilities, with these details being reaffirmed by the International Atomic Energy Agency.<sup>88</sup> However, some have pointed out that the security threat Ukraine faces with the Russian invasion could have been wildly different if they had not surrendered the nuclear arsenal on their territory after the collapse of the Soviet Union.<sup>89</sup> The risk of horizontal proliferation in Eastern Europe due



**Andriy Melnyk,**  
Ambassador of Ukraine to  
Germany since 2015

Source: [www.en.topwar.ru](http://www.en.topwar.ru)

<sup>86</sup> Seung Taek, K. (2010, July 2). “Rethinking Extended Deterrence.” Center for Strategic & International Studies. Retrieved June 11, 2022, from [https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy\\_files/files/publication/100702\\_Rethinking\\_Extended\\_Deterrence-english.pdf](https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/100702_Rethinking_Extended_Deterrence-english.pdf).

<sup>87</sup> Reality Check Team. (2022, May 9). Ukraine War: Putin’s victory day speech fact-checked. BBC News. Retrieved June 11, 2022, from <https://www.bbc.com/news/61379405>

<sup>88</sup> Ibid.

<sup>89</sup> Bar, S. (2022, March 24). Deterrence after Ukraine—a critical analysis. Quillette. Retrieved June 11, 2022, from <https://quillette.com/2022/03/24/deterrence-after-ukraine-a-critical-analysis/>



to the deterioration of regional arms race stability is an unlikely event – it is moderately low risk compared to other aspects of regional strategic stability. So, while the threat of low-yield weapons may have contributed to the statements made by the Ukrainian diplomat on the development of nuclear capabilities, Russian low-yield nuclear weapons have not yet had a pronounced impact on regional arms race stability in Eastern Europe.

The geographical benefits of the United States are particularly important in this context. The U.S. has a stable relationship with its direct neighbors, and the presence of any low-yield nuclear weapons on U.S. territory is at minimal risk to alarm any of its regional partners and incite a regional arms race. However, U.S. low-yield weapons deployed on foreign territory severely reduce arms race stability in foreign spheres. Russian perception of the threats which NATO nuclear-shared U.S. weapons pose, especially with the B61-12 Life Extension Program underway, could provide the Russian Federation with satisfactory rationale to develop their own low-yield stockpile further. Russia has already claimed that the sharing of the B61-12, which was already a dangerously modernized weapon which lowered the nuclear threshold, violates the NPT and “runs counter to the NPT commitments.”<sup>90</sup> In many ways, the issue of arms race stability when U.S. / NATO nuclear sharing is considered transcends typical boundaries set under strategic stability divisions. The concept of strategic stability, which typically could address issues on the bilateral, regional, and global level, can be analyzed on all those levels collectively because U.S.-Russian deployments of low-yield nuclear weapons influence all three separations simultaneously. However, specifically on the regional level, U.S. and Russian development and deployment have led to significant reductions in arms race stability in Europe where the threat of nonstrategic nuclear weapons use looms the largest.

Considering how low-yield weapons have affected deterrence stability on the regional level, it is important to reiterate that the Russian military operation in Ukraine shows that U.S. extended deterrence does not protect a non-NATO member, therefore also simultaneously affecting crisis stability and changing perceptions of advantage. The potential for NATO to increase its membership is now a factor in regional stability, and with Russia’s resultant statement that it could change the nuclear-free status of the Baltic, many NATO and non-NATO allies are likely considering the implications of the United States’ failure to deter Russia. Some analysts believe that a likely response from nations who perceive Russia as a threat moving forwards would be the creation of new regional agreements- one analyst described the situation as follows:

<sup>90</sup> TASS. (2017, August 29). US B61-12 nukes may lower threshold of using nuclear weapons, diplomat says. Tass.com. Retrieved June 11, 2022, from [https://tass.com/politics/962483?utm\\_source=google.com&utm\\_medium=organic&utm\\_campaign=google.com&utm\\_referrer=google.com](https://tass.com/politics/962483?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.com)

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The most immediate repercussions will be felt by the NATO countries bordering Ukraine. The scenario of a protracted Russian occupation and Ukrainian resistance will create constant tension between these countries and Russia, and an ever-present risk of Russian cross-border retaliation or covert action (assassinations, bombings) against Ukrainians in those countries. Russia will also continue to issue military threats towards erstwhile Soviet satellites (Czechia, Slovakia, Poland, the Baltic states) which are now members of NATO. If NATO does not pose a credible military deterrent to these provocations, its deterrence will erode further. The former Soviet satellites are likely to form a sub-alliance within NATO or even a separate alliance in order to bolster their own defenses.<sup>91</sup>

This analysis has credibility, as even though the intentions of the Russian Federation are unknown after the hostilities in Ukraine inevitably end in some fashion, the ramifications of Russia threatening nuclear weapons use will last for years to come. It is not unreasonable to assume that even if states who feel threatened by Russian actions in Ukraine commit to a non-nuclear deterrence option rather than leave the NPT and develop their own, that they could align themselves either within or separate from other security alliances. Low-yield weapons are a threat to these states as conventional deterrence options have proven to be insufficient, changing how Eastern Europe must consider a response to Russian interests abroad.

Concerning crisis stability on the regional level, low-yield weapons have undoubtedly contributed to the decision-making of the Russian Federation in threatening use of nuclear escalation in regards to a conflict against a non-nuclear weapon state. There does not appear to be any incentive to use nuclear weapons yet, but the threat of raising Russia's deterrent forces was targeted at both Ukraine and other parties who would consider interference to limit Ukraine's options for outreach, and Russia used that moment to signal nuclear weapons are part of the conversation. The nuclear saber-rattling by the Russian Federation caused crisis stability in Europe to immediately plummet as European nations had to reconsider security policies in the event of additional Russian territorial incursions and the possibility Russia be incentivized to first use within its security doctrine. As mentioned, Finland and

<sup>91</sup> Bar, S. (2022, March 24). Deterrence after Ukraine—a critical analysis. Quillette. Retrieved June 11, 2022, from <https://quillette.com/2022/03/24/deterrence-after-ukraine-a-critical-analysis/>



Crisis stability deteriorated in regional aspects, particularly in Eastern Europe, because low-yield weapons provide the perfect threat to non-nuclear states fearing escalation by promising intolerable damage without indiscriminate violence

Sweden have moved to align themselves with the West and apply for NATO membership, which would also increase the chances for additional regional destabilization. After Finland and Sweden announced their intentions to bid for NATO membership, Russian President Vladimir Putin responded to the announcements by stating that while their membership would pose no inherent threat to Russian security, if military build-up were to occur in these new territories that it would provoke Russian response.<sup>92</sup> Dmitry Medvedev, Deputy Chairman of the Security Council of Russia, illuminated what that meant in his own statement in which he declared that the non-nuclear status of the Baltic would no longer be a factor in Russian considerations, and Russia would make decisions to ensure that balance would be restored to the region if Finland and Sweden's NATO bids were accepted.<sup>93</sup> Crisis stability deteriorated in regional aspects, particularly in Eastern Europe, because low-yield weapons provide the perfect threat to non-nuclear states fearing escalation by promising intolerable damage without indiscriminate violence. Even if the concerns of nuclear use in relevant conflicts have been assuaged, it does not guarantee that a crisis will not erupt out of the conflict which the Russian Federation initiated when it was emboldened to threaten nuclear weapon use.

Regional strategic stability is impacted through the development and deployment of low-yield nuclear weapons as evidenced by their clear impact on current events and the destabilization of the security environment. From increasing the risk of a non-nuclear state seeking its own nuclear deterrents, emboldening nations to threaten the use of nuclear weapon in reference to a conventional conflict, and heightening chances that regional actors will seek additional security measures, low-yield weapons have directly led to actions which have had significant impacts on regional stability.

The highest risk which low-yield nuclear weapons pose to regional strategic stability is the high risk of crisis stability spiraling and leading to a direct conflict between the United States and Russian Federation. Low-yield weapons are a dangerous influence in the already precarious relationship between the two nuclear powers. For the United States, the forward deployment of low-yield weaponry to European powers and the deployment of variable-yield submarine-launched ballistic missiles with an 8kt option are dangerous decisions which promote the utility of low-yield warheads. Russian deployment of low-yield nuclear weapon systems, with dual-capable options, create notable insecurities

<sup>92</sup> Faulconbridge, G. (2022, May 17). Putin sees no threat from NATO expansion, warns against military build-up. Reuters. Retrieved June 11, 2022, from <https://www.reuters.com/world/europe/russia-calls-finland-sweden-joining-nato-mistake-with-far-reaching-consequences-2022-05-16/>

<sup>93</sup> Faulconbridge, G. (2022, April 14). Russia warns of nuclear, hypersonic deployment if Sweden and Finland join NATO. Reuters. Retrieved June 11, 2022, from <https://www.reuters.com/world/europe/russia-warns-baltic-nuclear-deployment-if-nato-admits-sweden-finland-2022-04-14/>

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in an environment where stipulations of nuclear use are poorly defined. The longer the conflict is drawn out, the more both sides will become desperate, which is why some scholars fear the threat of nuclear use indicates that odds for use of a low-yield weapon to pre-maturely end the conflict are a non-zero amount. The threat of crisis stability is the one which must be addressed immediately, as the allure to Russia of utilizing a low-yield weapon in alignment with the purported escalate to de-escalate doctrine is unacceptable and would set a dangerous precedent. Crisis stability must be maintained so no parties see incentives for first use.

The next largest threat to regional strategic stability from low-yield nuclear weapons is the collapse of traditional deterrence stability. The rationale for preventing a war with Russia is sound, as a confrontation between the two states could easily derail and become a global crisis. Still the global perception of a lack of response is where there is a clear separation in understanding between not only the two powers, but all those affected by that decision as well. The United States sees saber rattling as dangerous, refusing to step up to the plate with its own low-yield weapons to defend its allies which is completely justified in its own regard to limit the chances of miscalculation. However, the rest of the world could perceive lack of U.S. action as an unwillingness to step up, and a signal to Russia that as long as the U.S. is not legally compelled to act it will not take any steps necessary to avoid confrontation. This is dangerous for deterrence stability as we have proof that deterrence serves to protect a nuclear state in its interests through nuclear threats, and for all its developments of tailored deterrence options that the United States will sit idly as the concept of deterrence is manipulated and abused. From a regional viewpoint, this is a dangerous precedent to show that low-yield weapons are a dangerous political tool to be used for a nation's advantage rather than a beneficial development. Deterrence and crisis stability will crumble due to low-yield weaponry, as they either act as a factor to embolden dangerous actions in foreign policy or to contribute to the lowering of the nuclear threshold without their prescribed deterrent qualities functioning as planned.

### In a global scope

The broadest interpretation of strategic stability, looking at the impact of low-yield nuclear weapons through a global lens, allows for wide-sweeping comprehensive interpretations of how the weapons affect the security environment. Understanding how low-yield nuclear weapons deployed by U.S. and Russia affect their bilateral and regional relationships provides important context for global strategic stability and the three aspects which comprise it.



Arms race stability is negatively impacted by the development and deployment of low-yield nuclear weapons by establishing new norms in weapons development, and contributing to a security environment which could promote an argument for limited nuclear war. While proponents may argue that low-yield weapons are a step in the right direction by limiting the destruction of a weapon, that will not matter when two states are racing to blur the line between conventional and nuclear damage only to find themselves unable to limit yields once a nuclear war begins. The race to nuclear viability is a dangerous approach to arms development, and with the United States and the Russian Federation helping to establish norms where these weapons can be deployed in combat it invites the destabilization of arms race stability. A realist perspective provides that as long as these weapons continue to be developed, the pattern of arms development as evidenced in the Cold War will continue with each party aiming to reclaim the upper hand against the other. However, these norms are also dangerous when applied to other conflicts with nuclear potential. The chronic instability between India and Pakistan has a dangerous history of brinkmanship and close calls. Pakistan's developments of low-yield weaponry with the Babur (Hatf7) ground-launched cruise missile, with a refusal to issue a No First Use policy, echoes the same dangerous sentiments as applied to the U.S.-Russian case.<sup>94</sup> These weapons, possessed by states in the midst of an ongoing crisis or with a longstanding history of military confrontation, only invite the introduction of further instability and welcome arms race developments between actors. A global acceptance of low-yield nuclear weapons as an option will inevitably result in a new arms race, and will result in profound destabilization of other aspects in strategic stability.

On crisis stability, low-yield weapons provide higher incentives for use in situations where their utilization could provide a clear strategic advantage. The use of low-yield nuclear weapons, either to take out battlefield targets in an example of theater nuclear weapons use or to eliminate a portion of a nation's second-strike capability via strategic targeting, would completely change the trajectory of any conflict in ways which have only ever been theorized. Therefore, the presence of weapons in global arsenals which provide leaders with a feasible option for nuclear escalation are dangerous for promoting that opportunity. In a rare deviation from the norm, the United States revealed that it had staged an exercise where the U.S. had to respond to a potential low-yield nuclear strike from Russia on a European state, and officials in that exercise chose to respond to escalation with their own limited nuclear strike.<sup>95</sup> But considerations of a nuclear response to nuclear

<sup>94</sup> CSIS Missile Defense Project. (2021, August 4). Babur (hatf 7). Missile Threat. Retrieved June 11, 2022, from <https://missilethreat.csis.org/missile/hatf-7/>

<sup>95</sup> Borger, J. (2020, February 24). US staged 'limited' nuclear battle against Russia in war game. The Guardian. Retrieved June 11, 2022, from <https://www.theguardian.com/>

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escalation cements what many have feared: the global powers have forgotten how dangerous nuclear war can truly be. The NATO exercise Carte Blanche had already illuminated that a nuclear war should be avoided at all costs, with Henry Kissinger stating that the “power of nuclear weapons inhibits their use unless there exists a doctrine which poses alternatives less stark than total devastation.”<sup>96</sup> The development of low-yield nuclear weapons by the U.S., Russia, and other nations highlights that we’ve forgotten the lessons of the 20<sup>th</sup> century, and current events illuminate that if those in positions of power do not take immediate steps to try to prevent the further deterioration of strategic stability soon, the risk of crisis stability spiraling will become higher as relations worsen.

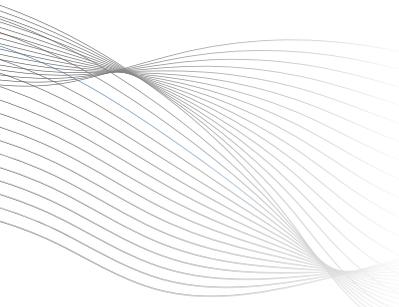
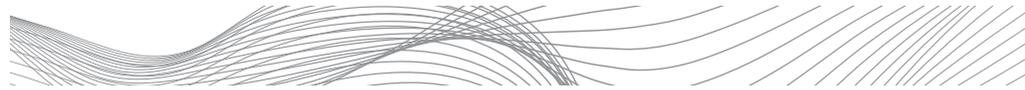
The impact that low-yield weapons have had on deterrence stability is simply unbelievable, because their utilization in different ways by two states who perceive deterrence differently has proven that in no ways have low-yield weapons contributed positively to global strategic stability as they were designed to. Low-yield nuclear weapons developed by the United States failed in their deterrent ambitions as defined in the 2018 NPT, failing to deter Russian action in Ukraine and proving that the extended deterrence policies of the U.S. are largely unreliable in the face of genuine threat. Low-yield nuclear weapons developed by the Russian Federation negatively impacted deterrence stability by forcing the re-evaluation of how deterrence should be perceived; deterrence has done more for the aggressor in the Russian-Ukrainian conflict than it has done for any other party. Therefore, low-yield nuclear weapons have directly contributed to a reduction in global deterrence stability by failing to live up to the standards of deterrence being, in its most basic form, conflict prevention.

Outside of the approach taken in the other sections, it is also important to note a significant detail in the criticism of U.S. low-yield weapons and their utility in maintaining strategic stability: whether the U.S. maintained its current approach of refraining to respond to threats of nuclear escalation from the Russian Federation or if it had created a defined response of U.S. willingness to utilize nuclear weapons in response to the Russian threat, either option would have given an example of low-yield weapons negatively contributing to strategic stability. Just as the U.S. can be criticized for its lack of significant military response to Russian actions in Ukraine, highlighting that the low-yield nuclear weapons in the U.S. arsenal have failed in their purpose, the U.S. can equally be criticized for its willingness to develop low-yield nuclear weapons for that purpose due to the inherent destabilizing

Low-yield nuclear weapons have directly contributed to a reduction in global deterrence stability by failing to live up to the standards of deterrence being, in its most basic form, conflict prevention

world/2020/feb/24/limited-nuclear-war-game-us-russia

<sup>96</sup> Rawnsley, A. (2021, June 19). A nuclear war with NATO would be hell: This war game is the proof. *The National Interest*. Retrieved June 11, 2022, Quoted from: Henry Kissinger, Cited from <https://nationalinterest.org/blog/reboot/nuclear-war-nato-would-be-hell-war-game-proof-188158>



effects they have on the global arms control regime. Russia can be criticized for its recent actions, where the constant question of nuclear use in-line with the supposed Russian doctrine of escalate to de-escalate is suspected.

Together, the U.S. and Russia have contributed to the deterioration of global strategic stability so significantly through the development, deployment, and now potential threat of use of low-yield nuclear weapons that prospects to ameliorate the situation seem far-fetched. These weapon systems pose incredible risks to initiate a new arms race in the 21<sup>st</sup> century, to invite the consideration of use through their decreasing yield options, and quite literally change the concept of deterrence as it has been understood for decades. Moving forwards, decision-makers need to be presented with a list of options that can be utilized to prevent increasing damage of strategic stability by low-yield weapons – but not all suggestions may deal with them directly.

Aspect of Stability	Threat	Risk Level
Arms Race Stability	Additional funding designated to defense programs	High
Arms Race Stability	Deterioration of existing arms control agreements	Medium
Arms Race Stability	Development of non-nuclear capabilities to counter	High
Arms Race Stability	Initiating a new arms race	High
Arms Race Stability	U.S. re-funding of cancelled SLCM	Medium
Crisis Stability	Changing ready-status of nuclear deterrent forces	Medium
Crisis Stability	Demonstrative use of a low-yield nuclear weapon	Low
Crisis Stability	Deployment of dual-capable weapon systems	High
Crisis Stability	Theft of low-yield nuclear weapons	Medium
Deterrence Stability	Threats of use against non-nuclear weapon states	Medium
Deterrence Stability/Crisis Stability	Battlefield use of a low-yield tactical nuclear weapon	Low
Deterrence Stability/Crisis Stability	Creation of new regional sub-alliances	Medium
Deterrence Stability/Crisis Stability	Increased tensions between NATO/Russia	High

Crucial ways in which low-yield nuclear weapons could create instability between the U.S. and Russia

Source: made by the author

## POLICY RECOMMENDATIONS

Considering how low-yield weapons are affecting strategic stability and the global security environment, there is a need to address these issues before the relationship between the U.S. and Russia devolves past a point of no return. Luckily, it is not too late. Prospects of agreement between the two nuclear powers are few and far between, but the necessity of re-establishing a working relationship should surpass any tensions with the proper levels of political will. Unfortunately, both nations have only recently re-established the importance of low-yield weapons in their respective nuclear doctrines, so it is unlikely the first steps they would take in the current strategic environment would be to reduce their capabilities in that realm. Addressing low-yield weapons is a high priority, but taking practical steps to reach a point where safety is guaranteed during their removal is equally important.

Based off of the impact we have seen of low-yield weapons on global stability, the highest priority between the United States and the Russian Federation should be rebuilding their relationship to a point where they can address them, and the greatest way to accomplish this would be through various risk reduction measures to build confidence between the two states. There are a number of general measures both states could take to avoid conflict escalation, with the choices of which to take depending on their priorities in maintaining strategic stability.

In regards to general measures, one of the simplest would be a reaffirmation of the 1985 Reagan-Gorbachev statement that a nuclear war cannot be won and must never be fought in a significant forum such as through the United Nations Security Council in a resolution. The consistent reaffirmation of this principle is beneficial to not only opposing states, but to the international community as a whole in showing limits. Just clarifying that both states have full intentions of ensuring a nuclear war must not occur is one of the most powerful introductory efforts that could be made to reduce the threat of low-yield nuclear weapons, as concerns over their use being easier than traditional high-yield weapons are a driving factor in the argument over their purpose. If both countries were able to sit down and address that fact right off the bat, it could open the door for more serious propositions of confidence building. However, both states must fully stand by their re-affirmations, as the rest of the world needs to have faith that the United States and Russia will abide by this commitment before assisting in any future multilateral efforts. With both states fully aware of the fact risk reduction is a crucial aspect of addressing the threat of nuclear weapons, particularly those provided by low-yield options, another option both states could promote is a P5 working group which would commission an expert study on existing and historical global risk reduction measures. A group



of experts, if requested, could provide insight into viable options which would address the security concerns of both states while helping to improve the current state of strategic stability. Both of these options will open the door to further communication, and allow for further engagement to pull U.S.-Russian relations back from its current low levels.

Also, a willingness to keep engaging in a strategic capacity, even if just to the degree to ensure that there is an extension of New START in 2026, is a step that would prevent a devastating loss to bilateral nuclear relations between the U.S. and Russia. While they may be deemed necessary for ensuring the future of arms control, other treaties like the INF Treaty and Open Skies can even take the back seat to ensuring that a bilateral arms limitation treaty remains between the two nuclear powers so that decades of progress in limitations agreements is not put at risk. While the best possible outcome for addressing low-yield nuclear weapons would be the negotiation of a successor treaty to New START which addresses nonstrategic and low-yield weapons as well, considering the current level of engagement between U.S. and Russian officials an extension of the current treaty would suffice.

The next important measures could be related to escalatory use of nuclear weapons, as the threat of nuclear use in the ongoing crisis is non-zero and any opportunities to reduce likelihood of that event could help to improve the security environment. Risk reduction measures tied to escalatory use have the closest direct ties to crisis and deterrence stability, thus mostly deal with each nations' perception of dangers. Some ideas to focus on for the two sides to address concerns over escalatory use involve improving transparency of forces, taking steps to increase predictability, and working to promote discussions on avenues for eventual arms control agreements. These guidelines have multiple specific actions which both states could take, and with a significant history of risk reduction agreements between not only the U.S. and Russia but other global powers, there are shortages on precedents. It is only natural to assume agreements on nuclear weapons, especially agreements on quantity reduction, will not be feasible options immediately, but some actions on rebuilding a cooperative relationship do not include nuclear forces.

Bilateral options for the U.S. and Russia which do not directly address nuclear weapons include improving military-to-military engagement at multiple levels of authority, designation of command-and-control systems as off-limits from cyber interference, and improving transparency of conventional forces. One recommendation to re-establish military engagement is to follow the example set by Indonesia and Vietnam, where there is an agreement in place which allows reciprocal port visits by naval fleets to ports and bases. Colonel Nguyen Duc Nam, Vice Director of the Vietnam Naval Academy, supported this option

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for engagement between Vietnam and Indonesia as beneficial to development and stability of both countries.<sup>97</sup> Continuing with that sentiment, if both countries place importance on re-establishing meaningful communication, then drawing inspiration from the Argentina-Chile Standing Security Committee is a historically effective measure which allows for communication on regional concerns, armed forces, advancements in science or technology, and determining prospects for cooperation in confidence building measures.<sup>98</sup> While the current security environment may be too precarious at the moment for the U.S. and Russia to come to the table on all relevant issues in this format, a committee in this style could determine which issues they see as the highest priorities or can decide what stays off of the table until a point of better relations. The 2009 U.S.-Russia Bilateral Presidential Commission could be adapted moving forwards to pursue goals as outlined from the examples above, and work towards addressing non-nuclear related issues which could eventually lead to a security environment stable enough to address low-yield nuclear weapons.

Follow-up recommendations on escalatory use which do address nuclear weapons in some way focus on preventing a lowering of the nuclear threshold through comprehensive communication and transparency efforts. Agreements of this nature are less likely to be feasible choices right now, but some historic examples could provide the U.S. and Russia with opportunities to open channels for dialogue and create conditions which would make a misunderstanding or mistake less likely to blow out of proportion into a global catastrophe. First and foremost, the maintenance of dedicated channels and hotlines between the United States and Russia are essential to crisis prevention, and with the number of dual-capable systems or nuclear weapons with wildly different yield options a surefire method for fast communication helps prevent escalation in the event crisis stability completely destabilizes. Lewis A. Dunn, Former U.S. Ambassador to the Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, stated that hotlines of this nature “to restore sustained, substantive, and high-level dialogue” are a starting point in promoting bilateral engagement between the United States and Russia.<sup>99</sup> Following in those footsteps, U.S. and Russian reaffirmation of the 1973 Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War, signed by the United States and

<sup>97</sup> VNA. (2019, May 4). Vietnam People's Navy Sailing Ship concludes Indonesia visit: Politics: Vietnam+ (vietnamplus). VietnamPlus. Retrieved June 11, 2022, from <https://en.vietnamplus.vn/vietnam-peoples-navy-sailing-ship-concludes-indonesia-visit/152040.vnp>

<sup>98</sup> Ministry of Foreign Affairs Argentina. (2019, August 15). Argentina – chile: New meeting of the standing security committee. Ministerio de Relaciones Exteriores, Comercio Internacional y Culto. Retrieved June 11, 2022, from <https://cancilleria.gob.ar/en/announcements/news/argentina-chile-new-meeting-standing-security-committee>

<sup>99</sup> Roberts, B. (2020, June 6) Major Power Rivalry and Nuclear Risk Reduction: Perspectives From Russia, China, and the United States. United States. <https://doi.org/10.2172/1635770>



the Soviet Union, has significant potential in being revitalized as an option for improving confidence moving forwards while preventing opportunities for miscommunication based decisions. While it established a number of practices which contribute to the improvement of crisis stability, it would also act as a reaffirmation that, per Article I of the agreement, Parties would “act in such a manner as to prevent the development of situations capable of causing a dangerous exacerbation of their relations, as to avoid military confrontations, and as to exclude the outbreak of nuclear war between them and between either of the Parties and other countries.”<sup>100</sup>

Arms race stability was identified as being the highest concern for strategic stability between the United States and Russia not only due to the fact that instability here is the most likely to occur and will negatively impact other aspects of stability, but also because it will be the hardest for both nations to overcome. Referring to arms race stability, policy recommendations to prevent destabilization should focus on exchanges of relevant information on technological developments, establishment of common definitions, addressing provocative military actions or practices, and promoting discussions on low-yield weapons regarding their purpose in national doctrines. In order to decrease the likelihood of an arms race breaking out, the United States and Russia would need to increase the transparency of their weapons development initiatives, nuclear weapons doctrine, and use conditions. One specific action both states could take would be to address asymmetrical actions or gray zones in current systemic competitions, which would help bridge information gaps about the intentions and outcomes of foreign actions or developments. But all of those, while absolutely necessary to address the risks posed to arms race stability by low-yield nuclear weapons, are unlikely to occur as introductory confidence building, risk reducing measures. Reducing threats to crisis and deterrence stability are almost easier in comparison by discussing ways to improve the general security environment and pull back from a potential conflict, as a change in arms race stability would mean addressing deeply entrenched ways of thinking about strategic superiority and response to foreign developments. To address arms race stability, and the inherent problems caused by low-yield weapons, would require both states to be willing to step to the negotiating table on nuclear weapons issues immediately which is not likely.

Some measures which the U.S. and Russia could take which would have a genuine positive impact on the prospects for future arms control regime and set the ground-work for future collaboration, without needing to commit to any risk reduction measures or arms limitations, would be to cooperate and set mutually agreed-upon

<sup>100</sup> Agreement on the Prevention of Nuclear War. (1973). *The American Journal of International Law*, 67(4), 833–835. <https://doi.org/10.2307/2198610>

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definitions for relevant concepts relating to low-yield nuclear weapons and nonstrategic nuclear weapons such as establishing definitions by yield, range, or other capabilities. However, even with decisions which would not commit to reductions or limitations, both the United States and the Russian Federation should make best efforts to revive bilateral strategic stability talks. A lack of communication cannot improve the global situation, and even creating the opportunities for dialogue is a significant step in opening up the bilateral relationship to collectively address current and future issues.

In a multilateral scope, one way both states can immediately work to improve strategic stability is to coordinate meetings between the delegates for the Review Conference of the Non-Proliferation Treaty in which discussions could be held on possible convergence points. It could produce a limited but effective launchpad for mutually-supported endeavors to be addressed in negotiations. This option would also allow other relevant states to engage in good faith to support any proposals with potential for consensus. The upcoming review conference will face numerous challenges, but among those challenges are opportunities where the U.S. and Russia can converge and initiate genuine progress.

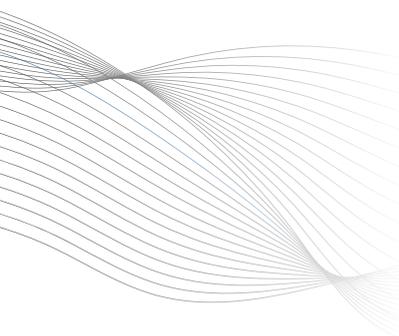
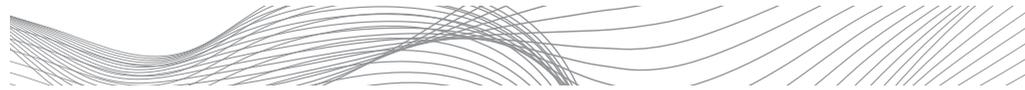
On the other hand, one of the hardest discussions which the U.S. and Russia should have is on the topic of permissible nuclear threats. In order to address how low-yield weapons will be utilized going forwards, and in making declarations on the purpose of nuclear weapons in each nation's respective arsenals, for deterrence stability to be repaired there needs to be an understanding of what extent nuclear weapons can be threatened to maintain deterrence without violating international humanitarian law and the UN Charter. Norms will need to be established. This will be a difficult decision for both parties to come to amicably, but necessary for both parties to resume their strategic relationship.

Ultimately, low-yield nuclear weapons pose an immediate and under-addressed threat to global strategic stability, and yet the most sensible solution both states could decide to take would be to not address them first. The current strategic environment is not in a place where either the United States or the Russian Federation will take the initiative to address low-yield nuclear weapons immediately, and there are no simple solutions to the problems facing the international community. Unfortunately, to address these dangerous, low-yield options, both states should pursue options for risk reduction and confidence building to re-establish a working relationship, and once both states are willing to come to the table and negotiate in good faith on solutions, continuing to utilize risk reduction measures as outlined above will improve strategic stability.

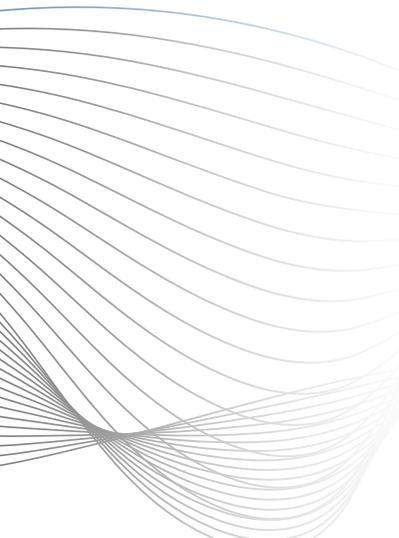


10th NPT Review  
Conference,  
August 26, 2022

Source: [www.pircenter.org](http://www.pircenter.org)



The current state of global strategic stability is dismal, a lack of mutual confidence has led to the deterioration or complete decay of arms control agreements and norms which acted as stabilizing measures for decades



## CONCLUSION

While recent discourse around low-yield nuclear weapons highlights their use as an effective deterrent measure as nonstrategic nuclear weapons which increase global strategic stability, the reality is that these low-yield nuclear weapons blur the line between conventional and nuclear conflict and actively contribute to the decline in the international security environment. The current state of global strategic stability is dismal, a lack of mutual confidence has led to the deterioration or complete decay of arms control agreements and norms which acted as stabilizing measures for decades. The fact that U.S. and Russian nuclear doctrines are increasingly relying on these low-yield, nonstrategic nuclear forces underlines a concerning decline in reliance on the traditional strategic nuclear forces as tools in international relations. The trend in their development and deployment of low-yield alternatives points towards nuclear doctrine being used for regional conflict resolution rather than enhancing strategic deterrence. While relying on traditional, strategic weapon deterrence for conflict prevention has already been heavily criticized, this shift towards reliance on low-yield deterrence has led to heightened regional security concerns, fears over failure of deterrence as a concept, and increased global tensions with intensifying risks of tipping delicate situations into high escalation risk scenarios.

The legitimization of low-yield options in nuclear doctrine through their expanded operationalization is a dangerous risk which could completely destabilize the global security environment if it remains unaddressed. Both the United States and Russian Federation have directly deteriorated the security environment with their expansion of low-yield weaponry in the name of contemporary deterrence measures. While the United States' 2018 Nuclear Posture Review states that their deployment of these weapons *enhance the flexibility and range of its tailored deterrence options*, the strategic environment has not improved since their announcement or deployment, the technology drives global actors into new arms races, and we continue to lower the threshold of nuclear use and raise risk of nuclear accident.<sup>101</sup>

The responsibilities of the United States and Russian Federation as nuclear weapon states under the Treaty on the Non-Proliferation of Nuclear Weapons need to be re-evaluated, and their existing commitments to averting the dangers of nuclear war revisited. The findings of this paper indicate that action from the United States and the Russian Federation to begin work on decreasing the role these weapons play in their respective nuclear doctrines is a step

<sup>101</sup> Office of the Secretary of Defense, 2018 Nuclear Posture Review (2018). U.S. Department of defense. Retrieved June 10, 2022, from <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

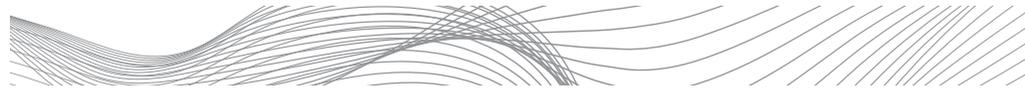
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which both states should take to prevent further deterioration of strategic stability in every aspect.

While low-yield nuclear weapons pose a significant danger when considering the future of arms control, recommended actions do not include immediately addressing them. The relations between U.S. and Russia are at a 21<sup>st</sup> century low, and with both the United States and the Russian Federation recently operationalizing low-yield weapons as part of their updated doctrines, addressing them without improving the nations' strategic relationship is highly improbable. Recommended actions include the utilization of risk reduction and confidence building measures to improve the current strategic relationship between the United States and Russia while simultaneously attempting to reduce tensions related to the ongoing conflict in Ukraine. The only solutions to this problem require communication, and improving the global security environment is a priority before a failure in crisis stability, deterrence stability, or arms stability creates a global catastrophe.

Other solutions involve creating specific definitions for low-yield weaponry and all associated undefined systems for mutual use between the United States and Russian Federation as the first step in dealing with concerns about these weapons is identifying exactly what needs to be addressed. This will not require any substantive contributions to the nonproliferation and disarmament regimes, thus only requiring communication and the intent to reduce the risk of nuclear escalation.

The threat of low-yield nuclear weapons needs to be addressed, as their current effects on global strategic stability have proven that though they were designed to serve the strategic interests of the United States and the Russian Federation, the operationalization of low-yield options has instead produced a consistent deterioration of the security environment while threatening the upheaval of 80 years of deterrence. ■



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# U.S. AND RUSSIAN LOW-YIELD NUCLEAR WEAPONS: THREATS TO GLOBAL STRATEGIC STABILITY

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## ARMS CONTROL AND SCENARIOS OF NUCLEAR DISARMAMENT

This occasional paper was made within the framework of the project *Arms Control and Scenarios of Nuclear Disarmament*, which is part of the Nuclear Nonproliferation & Russia Program. Within its framework PIR Center elaborates set of practical steps for the preparation of new international negotiations aimed at deep reduction of nuclear arsenals; develops recommendations on the issue of possible significant reduction of all types of nuclear weapons; analyses possibilities of cooperation between the Russian Federation and the USA in the field of missile defense. The project has been implemented since October 2008.

## *THE EVSTAFIEV SERIES*

This occasional paper was produced within *The Evstafiev Series*. This is a series of research and analytical publications written by young, aspiring authors (primarily, MA graduates and post-graduates) from Russia and around the globe in the area of global security. For many, this is their first or one of the first peer-reviewed publications. All drafts are subjects to external evaluation by a panel at expert-level or educational seminars by PIR Center or in similar formats. Only drafts accepted by the expert panel are submitted for peer review and, if positive, for publication in the Series.

Annually, on November 15, *The Evstafiev Series* Selection Committee announces its decision on the Evstafiev Award.

Gennady Mikhailovich Evstafiev (1938 - 2013) is an outstanding Soviet and Russian WMD nonproliferation and global security expert. He devoted the last ten years of his life to PIR Center, where he worked as a Senior Advisor and Senior Vice President. Gennady Evstafiev paid special attention to the progress in creativity and analytical skills of young generation, considering this to be PIR Center's - and his own - most important mission.

To visit Gennady Evstafiev's memory gallery, please, go to: <https://pircenter.org/experts/194-gennady-evstafiev>

The Gennady Evstafiev Award was established in 2021. The Award winners list:

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