National Defence Défense nationale

Canadian Forces College

Collège des Forces Canadiennes

THE BMD RED HERRING : BALLISTIC MISSILE DEFENCE SERVES RUSSIA'S GREAT POWER ASPIRATIONS

Major H. Joel Stubbert

JCSP 44

Exercise *Solo Flight*

Disclaimer

Opinions expressed remain those of the author and do not represent Department of National Defence or Canadian Forces policy. This paper may not be used without written permission.

PCEMI 44

Exercice *Solo Flight*

Avertissement

Les opinons exprimées n'engagent que leurs auteurs et ne reflètent aucunement des politiques du Ministère de la Défense nationale ou des Forces canadiennes. Ce papier ne peut être reproduit sans autorisation écrite.

Canada

CANADIAN FORCES COLLEGE – COLLÈGE DES FORCES CANADIENNES

JCSP 44 – PCEMI 44
2017 – 2019

EXERCISE *SOLO FLIGHT* – EXERCICE *SOLO FLIGHT*

THE BMD RED HERRING: BALLISTIC MISSILE DEFENCE SERVES RUSSIA'S GREAT POWER ASPIRATIONS

By Major H. Joel Stubbert

THE BMD RED HERRING:
BALLISTIC MISSILE DEFENCE SERVES RUSSIA'S GREAT POWER ASPIRATIONS

Russia is seeking to re-establish its *great power* status. Unhappy with Western encroachment into its former territories and a loss of influence, it has invested in its soft and hard power resources to counter Western dominance and reclaim its former prestige. Ballistic Missile Defence (BMD), the nonsensical fantasy of anxiety-stricken politicians provides Russia with a convincing threat narrative, whose drama plays on entrenched Russian fears of Western domination, inflaming nationalistic forces and providing a persuasive hard power investment opportunity.

Russia claims the intent of BMD is to degrade its strategic nuclear deterrent. However, it conveniently ignores the significant limitations of BMD systems and the significant obstacles that will restrain future systems, not to mention its considerable retaliatory capabilities. BMD serves Russia's *great power* strategy by teasing the anxieties of the Russian psyche, thereby consolidating domestic support behind the government, enabling significant military investments and provocative posturing, which advance the Russian goals of reclaiming its former power and dethroning American hegemony, thus reclaiming its place as a *great* European power.

Russia's Great Power Strategy and BMD

Russia's *great power* strategy entails the reestablishment of Russian power and influence within the borders of the old Soviet Union, and reclaiming its place as "the natural hegemon of Europe."[1] Western expansion has been a bitter pill for Russian elites who, in their estimation,

[1] B. Payne, and John S. Foster, "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 5-6. https://doi.org/10.1080/01495933.2017.1277121.

view it as "an intolerable danger and threat."[2] BMD is yet another example of that danger and a reminder of the American threat.

BMD fulfils a useful political purpose for the Russians. It complements their Western conspiracy narratives; those of a Russia under constant American threat and Western collusion to prevent Russia from its great power destiny.[3] It also provides an ideal backdrop for hard power investment. Russian military power, in particular, its nuclear forces are a fundamental component of Russian power, and threats against it, even manufactured ones, are met with exaggerated rhetoric and threat inflation. An inflated threat is useful because it provokes powerful emotional responses, creating a sense of urgency that encourages investments to counter-balance the perceived threat. Those investments facilitate the expansion of Russian influence over former Soviet spaces and Europe, as well as constraining American power and NATO's resolve.[4]

Framing Ballistic Missile Defence

BMD is an umbrella term that captures the various U.S. missile defence programs. It consists of five systems: Ground-Based Mid-Course Defence (GMD), Aegis BMD ships and Aegis Ashore, Terminal High Altitude Area Defence (THADD), and Patriot.[5] GMD and Aegis BMD are the only systems with meaningful anti-ICBM capabilities (mid-course interception). THADD and Patriot do not challenge Russia's nuclear deterrent.

---

[2] B. Payne, and John S. Foster, "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 6. https://doi.org/10.1080/01495933.2017.1277121.

[3] *Ibid, 8,41.*

[4] David W. Jr. Kearn, "The hard truths about soft power." *Journal of Political Power* 4, no. 1 (April 2011): 74; B. Payne, and John S. Foster, "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 65, https://doi.org/10.1080/01495933.2017.1277121.

[5] G. Lewis, & Frank von Hippel, "Improving U.S. Ballistic Missile Defence Policy." *Arms Control Today* (May 2018): 18, https://www.armscontrol.org/act/2018-05/features/improving-us-ballistic-missile-defense-policy.

The intent of GMD is continental defence against rogue intercontinental ballistic missiles (ICBMs). It consists of 44 ground-based interceptors (GBIs) located in Alaska and California, which are guided by a series of sea, land, and space-based sensors.[6] GBIs are powerful rocket boosters that carry exoatmospheric kill vehicle(s) (EKV) into space at speeds around six kilometers per second.[7] Once in space, the EKV is released and uses its sensors and thrusters to intercept the warhead. Poland and Romania were to receive 10 GBIs to protect against Iranian ICBMs, but the Obama administration cancelled that project in 2009 in favor of the Aegis-based European Phased Adaptive Approach.[8] This followed the Clinton administration's explicit move away from a "national" missile defence in Europe to a theater missile defence system.[9] Some observers suggest that this was done to alleviate Russian concerns regarding GMD.[10]

The European Phased Adaptive Approach (EPAA) extends missile defence protection to NATO and European allies from "short, medium, and intermediate-range missiles launched from the Middle East."[11] The system relies on the smaller (and slower) Standard Missile-3 (SM3) launched from Aegis BMD equipped warships and Aegis Ashore facilities located in Romania

---

[6] L. Grego, "US Ground-based midcourse missile defence: Expensive and unreliable." *Bulletin of the Atomic Scientists* 74, no. 4 (June 2018): 220, https://doi.org/10.1080/00963402.2018.1486592.

[7] G. Lewis, & Frank von Hippel, "Improving U.S. Ballistic Missile Defence Policy." *Arms Control Today* (May 2018): 18, https://www.armscontrol.org/act/2018-05/features/improving-us-ballistic-missile-defense-policy.

[8] T. Postol, "Are Trump and Putin Opening Pandora's Box?" R, *The New York Times* 19 Febuary 2019. https://www.nytimes.com/2019/02/19/opinion/inf-treaty-missile-defense.html.

[9] Thomas Karako, Ian Williams, and Wes Rumbaugh. *Missile Defence 2020: Next Steps for Defending the Homeland* (Washington, D.C.: Center For Strategic & International Studies, 2017): 47, http://missilethreat.csis.org/wp-content/uploads/2017/04/170406_Karako_MissileDefense2020_Web.pdf.

[10] J. Sankaran, "The United States' European Phased Adaptive Approach Missile Defence System; Defending Against Iranian Threats Without Diluting the Russian Deterrent." *RAND National Security Research Division*. (RAND Corporation, 2015), xi.

[11] A. Katona, A, "NATO Territorial Ballistic Missile Defence and its Implications for Arms Control." *The Nonproliferation Review* 22, no. 2 (Febuary 2016): 254, https://doi.org/10.1080/10736700.2015.1117314.

and Poland.[12] The EPAA program initially included four phases with each phase increasing missile and or sensor capabilities. Phase-four, which included the high-speed SM3 Block IIB missile was cancelled in 2013 citing technical problems and costs. However, it is generally accepted that the move was to reassure Russia that the system was not intended to affect their strategic nuclear deterrent.[13]

The promise of missile defence and American preoccupations with North Korean and Iranian missile threats ensure that the U.S. will remain committed to BMD development. Funding for 20 additional GMD interceptors has been approved, but there are plans to increase the number of GMD interceptors to 104.[14] Similarly, there are plans to expand EPAA, with estimates predicting the cache of SM3 Block IIA missiles will increase to between 300 and 400 interceptors, as well as 80-90 ship-based Aegis BMD systems.[15]

A Survey of Russia's Deterrent

Awesome best describes Russia's nuclear deterrent. In 2019 it was estimated that Russia had 4,490 nuclear warheads available for use. Of these 1,600 are loaded on missiles or bombers, 1,070 are in storage, and 1,820 are smaller non-strategic weapons. Additionally, there is a substantial stockpile of retired warheads awaiting deactivation that could theoretically be made available for use. [16]

---

[12] J. Sankaran, "The United States' European Phased Adaptive Approach Missile Defence System; Defending Against Iranian Threats Without Diluting the Russian Deterrent." *RAND National Security Research Division*. (RAND Corporation, 2015), 3.

[13] *Ibid.,* 6.

[14] G. Lewis, & Frank von Hippel, "Improving U.S. Ballistic Missile Defence Policy." *Arms Control Today* (May 2018): 20, https://www.armscontrol.org/act/2018-05/features/improving-us-ballistic-missile-defense-policy.

[15] *Ibid.*

[16] Hans M. Kristensen and Matt Korda, "Russian nuclear forces 2019." *Bulletin of the Atomic Scientists* 75, no. 2 (March 2019): 73, https://doi.org/10.1080/00963402.2019.1580891.

Russia has 318 ICBMs that can carry 1,165 warheads. It has ten ballistic missile submarines (SSBNs) that can carry 160 Sub-Launched Ballistic Missiles (SLBMs), and 68 strategic bombers that can carry a further 786 warheads on Air-Launched Cruise Missiles (ALCMs) and bombs. There are also a significant number of platforms available to carry its lower yield non-strategic warheads. These include 300 fighter/ bomber aircraft, and a substantial number of shorter-range ballistic missiles, Land Attack Cruise Missiles (LACMs), Sub-Launched Cruise Missiles (SLCMs), anti-ship weapons, anti-sub rockets, depth charges, and torpedoes.[17] It is a significant deterrent.

Russia identifies BMD as the principle catalyst responsible for its weapon modernization efforts and development of new dramatic weapon systems which are clearly intended to attract maximum attention. Weapon development and modernization serve several purposes. It increases Russian hard power, and concurrently shapes the illusion of having military parity with the U.S. It also stimulates fear, even unlocking old Cold War fears within governments and civilian populations. Anxiety is particularly acute when it relates to nuclear weapons.

The Status-6 (Poseidon) nuclear powered (and armed) underwater drone is a worthy first example. Purportedly this multi-megaton carrying drone has a range of 10,000 km, can submerge to 1,000 m and travel at speeds around 100 km/hr.[18] While little information is available, the proposed purpose of this drone is to damage and irradiate large swaths of coastal

[17] Hans M. Kristensen and Matt Korda, "Russian nuclear forces 2019." *Bulletin of the Atomic Scientists* 75, no. 2 (March 2019): 74-82, https://doi.org/10.1080/00963402.2019.1580891; Payne, B. and John S. Foster. "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 1-89. https://doi.org/10.1080/01495933.2017.1277121. Kristensen, Korda, and Payne provide comprehensive assessments of Russia's deterrent that go far beyond this summary.

[18] B. Payne, and John S. Foster. "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 52, https://doi.org/10.1080/01495933.2017.1277121.

land, presumably cities and ports, rendering it unavailable for a very long time.[19] The Russian's argue that this sort of underwater weapon it necessary to bypass missile defence.[20]

Russia is also developing a "heavy" liquid-fueled ICBM code-named *Sarmat* which is estimated to carry 10-15 warheads or hypersonic glide vehicles that will evade missile defences.[21] These missiles will supplement the improved Topol-M missiles which were upgraded to defeat ballistic missile defences with high speed, a small "boost-phase" infrared signature, advanced decoys, mid-course maneuvering, and maneuverable independent re-entry vehicles.[22]

Finally, Russia has developed a ground-launched, nuclear-capable, cruise missile (GLCM) known as SSC-8. SSC-8 has been accused of violating the Intermediate-Range Nuclear Forces Treaty (INF).[23] The purported 1000+ km range validates these accusations.[24] Due to its range and flight profile, the SSC-8 will threaten most of the European continent and pose a significant risk to NATO forces.[25] As of 2019, 100 SSC-8s are deployed among four missile battalions.[26]

---

[19] B. Payne, and John S. Foster. "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 52, https://doi.org/10.1080/01495933.2017.1277121.

[20] J. Lewis, "Putin's Doomsday Machine." *Foreign Policy,* 12 November 2015, https://foreignpolicy.com/2015/11/12/putins-doomsday-machine-nuclear-weapon-us-russia/;

[21] Hans M. Kristensen and Matt Korda, "Russian nuclear forces 2019." *Bulletin of the Atomic Scientists* 75, no. 2 (March 2019): 78, https://doi.org/10.1080/00963402.2019.1580891.

[22] J. Trevithick, "Russia Fires Topol Ballistic Missile to Test New Tech to Defeat Missile Defence Systems." *The WARZONE*, 26 December 2017, http://www.thedrive.com/the-war-zone/17197/russia-fires-topol-ballistic-missile-to-test-new-tech-to-defeat-missile-defense-systems.

[23] Hans M. Kristensen and Matt Korda, "Russian nuclear forces 2019." *Bulletin of the Atomic Scientists* 75, no. 2 (March 2019): 81, https://doi.org/10.1080/00963402.2019.1580891.

[24] T. Rogoway, "Russia Breaks Arms Control Treaty by Deploying Land-Based Cruise Missile," *The WarZone,* 14 February 2017, https://www.thedrive.com/the-war-zone/7666/russia-breaks-arms-control-treaty-by-deploying-land-based-cruise-missiles.

[25] B. Payne, and John S. Foster. "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 68, https://doi.org/10.1080/01495933.2017.1277121.

[26] Hans M. Kristensen and Matt Korda, "Russian nuclear forces 2019." *Bulletin of the Atomic Scientists* 75, no. 2 (March 2019): 81, https://doi.org/10.1080/00963402.2019.1580891.

BMD is ineffective against the Russian Nuclear Deterrent

It is generally accepted that missile defence systems are easily defeated by adversaries with sufficient missiles to overwhelm the system.[27] Russia has adequate means to overwhelm the current and probable near future missile defences; nonetheless, there are fundamental limitations with BMD that would otherwise still guarantee the survivability of Russia's deterrent.

First, GMD has too few interceptors. Even if the planned 104 GBIs became a reality, they are inadequate against a Russian Strike. Worse, GMD interceptor testing has yielded an alarmingly poor 50% success rate under highly scripted test conditions,[28] and that "success" would likely decrease significantly in real-world conditions.[29]

The shortcomings of GMD are not a secret. A 2017 Department of Defence report found that GMD only "demonstrated the capability to defend the [US] from a small number of intermediate-range ballistic missiles (IRBM) or… [ICBM] threats with simple countermeasures."[30] Russian experts, who are also fully aware, predict that "it would take five US interceptors to reliably shoot down one first-generation Iranian warhead."[31] They also say that "Russian ICBMs and SLBMs are equipped with highly effective penetration aids,"[32] which, by their estimates, would double the interceptors necessary per each Russian warhead.[33]

---

[27] A. Katona, A, "NATO Territorial Ballistic Missile Defence and its Implications for Arms Control." *The Nonproliferation Review* 22, no. 2 (February 2016): 258, https://doi.org/10.1080/10736700.2015.1117314

[28] G. Lewis, & Frank von Hippel, "Improving U.S. Ballistic Missile Defence Policy." *Arms Control Today* (May 2018): 18-19, https://www.armscontrol.org/act/2018-05/features/improving-us-ballistic-missile-defense-policy.

[29] L. Grego, "US Ground-based midcourse missile defence: Expensive and unreliable." *Bulletin of the Atomic Scientists* 74, no. 4 (June 2018): 221-222, https://doi.org/10.1080/00963402.2018.1486592.

[30] G. Lewis, & Frank von Hippel, "Improving U.S. Ballistic Missile Defence Policy." *Arms Control Today* (May 2018): 18, https://www.armscontrol.org/act/2018-05/features/improving-us-ballistic-missile-defense-policy.

[31] M. Tsypkin, M, "Russia, America and missile defence." *Defence & Security Analysis* 28, no. 1 (April 2012): 56, https://doi.org/10.1080/14751798.2012.651379.

[32] *Ibid.*

[33] *Ibid.*

Assuming that estimate is correct and believing the effectiveness of countermeasures, the future 104 US-based GBIs would be defeated by 11 Russian warheads. To put that in perspective, three Topol-M ICBMs can carry 12 independent warheads.[34]

The Aegis-based EPAA also suffers from critical limitations. First, the Aegis *SPY-1D* radar has a limited range and "cannot provide track data on Russian ICBMs if its' located in or around Europe."[35] Like GMD, the Aegis-based system requires tracking information from various Early Warning Radars (EWRs) and space-based infrared sensors creating detection delays. Basically, by the time a Russian missile is detected, it would be flying too fast and outside of the SM3 interception envelope.

Second, the SM3 missile is too slow. Ballistic-missile "interceptors with speeds below approximately 5km/s, launched from sites in or around Europe, could not intercept Russian ICBMs or [SLBMs] without violating the laws of physics."[36] The older SM3 IA and IB missiles have burnout velocities of around 3km/second making them far too slow. The Phase 3 SM3 IIA missile is improved, with a burn out velocity around 4.5 km/second.[37] While still below the 5km/sec threshold, there is a theoretical possibility of an interception, but the probability is negligible.

---

[34] Hans M. Kristensen and Matt Korda, "Russian nuclear forces 2019." *Bulletin of the Atomic Scientists* 75, no. 2 (March 2019): 77, https://doi.org/10.1080/00963402.2019.1580891.

[35] D.A. Wilkening, "Does Missile Defence in Europe Threaten Russia?" *Survival: Global Politics and Strategy,* 54 no.1 (Jan 2012): 39, https://doi.org/10.1080/00396338.2012.657531.

[36] R. Zadra, "NATO, Russia and Missile Defence." *Survival, Global Politics and Strategy 56, no.*4 (July 2014): 53, https://doi.org/10.1080/00396338.2014.941555.

[37] G. Lewis, & Frank von Hippel, "Limitations on ballistic missile defence—Past and possibly future." *Bulletin of the Atomic Scientists* 74, no.4 (June 2018): 203, https://doi.org/10.1080/00963402.2018.1486575.

The Aegis Ashore-site in Romania "will not be able to kinematically reach Russian ICBMs."[38] The Aegis site in Poland could, in an unrealistic zero-time delay condition, intercept ICBMs from two Russian ICBM launch sites located at Kozelsk and Tatishchevo, provided those missiles were targeting Washington D.C.[39] However, there would be no possibility of an interception if those missiles were targeting a Pacific coast city due to the missile track over the pole.[40] Hypothetically even if the EPAA Phase 4 SM3 Block IIB missile were used (5.0km/sec), it could only intercept Russian missiles from the five western-most launch sites, leaving nine other sites, not to mention its SSBN's and Bombers, available to strike Washington D.C.[41]

There is, of course, no such thing as a zero-time delay. Even with state-of-the-art tracking capabilities, it would take 45 to 60 seconds or more to detect a launch and refine its track sufficiently to launch an interceptor, and that time-delay doesn't account for system or human "decision" delays.[42] Russian experts believe the X-Band Norwegian *Globus II* radar will start tracking Russian ICBMs around 140 seconds.[43] NATO predicts that it would be the EWR at Royal Air Force Fylingdales that would be the first to detect a Russian launch and expect that delay to be three minutes.[44] These lengthy delays reduce EPAA interception probabilities against Russian ICBMs to zero. Figure 1 illustrates the radar horizon(s) of U.S. EWRs in order to

---

[38] J. Sankaran, "The United States' European Phased Adaptive Approach Missile Defence System; Defending Against Iranian Threats Without Diluting the Russian Deterrent." *RAND National Security Research Division*. (RAND Corporation, 2015), 37.

[39] *Ibid.*

[40] *Ibid.*

[41] *Ibid.*

[42] K. Barton, *et al,* "Report of the American Physical Society Study Group on Boost-Phase Intercept Systems for National Missile Defence: Scientific and Technical Issues." *American Physical Society* (13 October 2004): *xxiii*. https://journals.aps.org/rmp/pdf/10.1103/RevModPhys.76.S1.

[43] J. Sankaran, "The United States' European Phased Adaptive Approach Missile Defence System; Defending Against Iranian Threats Without Diluting the Russian Deterrent." *RAND National Security Research Division*. (RAND Corporation, 2015), 38.

[44] *Ibid.*

provide a "time and space" perspective. Note the location of the coverage of the Fylingdales radar and the relatively small "bubbles" around the Aegis *SPY-1D*.

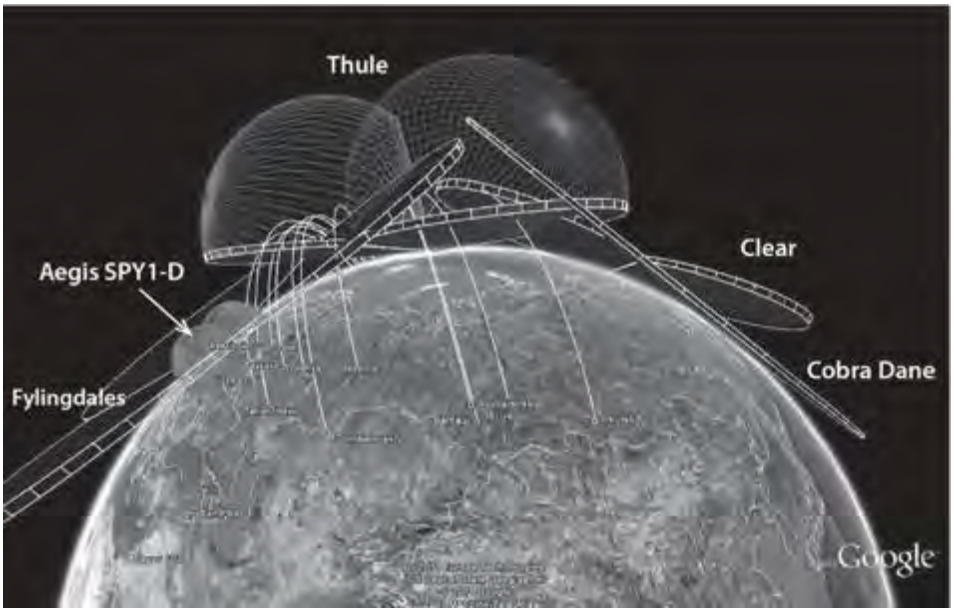

Figure 1 –Early Warning Tracking Radar (EWR) tracking of Russian ICBMs
Source: Wilkening, *Does Missile Defence in Europe Threaten Russia,* 39.

Other obstacles add to the problems of BMD. Countermeasures, for example, are a relatively cheap but highly effective way of defeating warhead interceptors. They come in an assortment of methods intended to disguise, hide, or confuse radar and interceptor sensors.[45] Since each missile can carry multiple countermeasures, multiple interceptors must be launched at each missile, or the interceptor must be able to discriminate between the warhead and countermeasure. The vacuum of space significantly complicates warhead discrimination because simple objects such as metallic balloons can move and behave the same as a warhead.[46]

---

[45] Andrew Sessler, *et al*, *Countermeasures: A Technical Evaluation of the Operational Effectiveness of the Planned US National Missile Defence System*. Cambridge: Union of Concerned Scientists, 2000, 35-81, 145. https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/cm_all.pdf.

[46] Union of Concerned Scientists. "Countermeasures (2000)," Last accessed 15 April 2019, https://www.ucsusa.org/nuclear-weapons/us-missile-defense/countermeasures.

Maneuvering warheads and hypersonic glide vehicles further complicate missile interception. In addition to their extreme speed, maneuvering warheads and hypersonic vehicles can change their ballistic trajectories, thereby invalidating an interceptor's kill solution. Since effective missile interception depends on a predictable track, a track change will defeat GMD and SM3 interceptors.

Finally, it is a matter of basic math and economic reality. It would take between 5,825 and 11,650 interceptors to defeat Russia's ground-based ICBMs and their 1,165 warheads alone (using the aforementioned 5 or 10-to-one ratio). That is far beyond the capability of the planned 104 GMD interceptors and 400 EPAA SM3 BIIA missiles.

It is also beyond American fiscal realities. American budget constraints are typically missing from the BMD debate and these constraints will, regardless of lofty ambitions, restrain BMD development.[47] For reference, GMD, by 2018 had cost $40 billion.[48] The entire missile defence program has cost well over $100 billion, but can be defeated by "countermeasures costing millions."[49] It is economically impractical to pursue a system capable of undermining Russia's nuclear deterrent because Russia's current, and likely future deterrent will overwhelm any missile defence umbrella.

Amazingly the threat narrative persists despite these realities, and decisions to scrap European GMD and EPAA Phase 4. In fact, Russia doesn't seem particularly bothered by GMD or Aegis BMD ships placed elsewhere despite the fact they would present some challenges to

---

[47] M. Tsypkin, "Russia, America and missile defence," *Defence & Security Analysis* 28, no. 1 (April 2012): 59, https://doi.org/10.1080/14751798.2012.651379.

[48] J. Sankaran, "The United States' European Phased Adaptive Approach Missile Defence System; Defending Against Iranian Threats Without Diluting the Russian Deterrent." *RAND National Security Research Division*. (RAND Corporation, 2015), 38.

[49] George. Lewis, & Frank von Hippel, "Limitations on ballistic missile defence – Past and possibly future." *Bulletin of the Atomic Scientists* 74, no. 4 (June 2018): 199, https://doi.org/10.1080/00963402.2018.1486575.

Russian ballistic missiles.[50] Indeed, Russian objections to U.S. missile defences has primarily been focussed on European missile defence,[51] specifically the locations of the European Aegis Ashore sites, despite their unconvincing threat. This behaviour is consistent with Russia's European strategy. It suggests that Russia is, in fact, confident with its ability to overcome BMD and that the real purpose of its bluster is to dissuade further Western encroachment and sustain the Western threat narrative for domestic consumption.

A plausible threat offers significant opportunity

A variety of emotionally charged factors offsets the futility of BMD. Be it hawkish American rhetoric, or Russian threat exaggeration and paranoia; they develop into a compelling threat narrative which situates Russia as a country under siege. After all, the West has expanded up to the Russian border and has been implicated in the Color Revolutions.[52] Now the U.S. and NATO are placing ballistic missile defences near the Russian border, in the lands of former Warsaw Pact allies to "make it impossible for Russia to retaliate against a U.S. nuclear (or massive conventional) attack… ."[53] It is further confirmation of the "growing military encirclement of Russia."[54]

---

[50] C.K. Bartles, "Russian Threat Perception and the Ballistic Missile Defence System." *The Journal of Slavic Military Studies* 30, no. 2 (April 2017): 155, https://doi.org/10.1080/13518046.2017.1307016; D.A. Wilkening, "Does Missile Defence in Europe Threaten Russia?" *Survival: Global Politics and Strategy,* 54 no.1 (Jan 2012): 40-41, 44-45, https://doi.org/10.1080/00396338.2012.657531, see figures 3-4,7, and 9.

[51] T. Karako, "Homeland missile defence: How the United States got here." *Bulletin of the Atomic Scientists* 73, no 3 (April 2017): 162, https://doi.org/10.1080/00963402.2017.1315035.

[52] Steff Reuben, *Strategic Thinking, Deterrence and the US Ballistic Missile Defence Project: From Truman to Obama* (London: Routledge, 2013), 90.

[53] M. Tsypkin, "Russia, America and missile defence," *Defence & Security Analysis* 28, no. 1 (April 2012): 56, https://doi.org/10.1080/14751798.2012.651379.

[54] Steff Reuben, *Strategic Thinking, Deterrence and the US Ballistic Missile Defence Project: From Truman to Obama* (London: Routledge, 2013), 90.

Indeed, the inflated threat is reinforced through other factors that include the opened-ended nature of BMD,[55] the dual-use capability of the Aegis Mk 41 launcher,[56] the sensational potential of the Prompt Global Strike Program (PGS),[57] and the fantastic predictions of future anti-missile capabilities.[58] While some of these factors are overinflated, others like PGS and the Aegis Mk 41 launcher pose legitimate potential threats.

However, there are contextual problems regarding the true impact of these factors. Chief among them is the diverse variety of Russian response options. Even if the U.S. repurposed the Aegis Ashore Mk 41 launchers to fire Tomahawk cruise missiles, and the PGS program came to fruition, if the West struck Russia, it is a reasonable certainty that Europe and the U.S. would be enfiladed by Russian Air, Sea, and land launched cruise missiles and ballistic missile forces. In other words, a meaningful strike on Russia would result in a costly, unpalatable counter-strike, making the idea unlikely.

Exaggerating the threat has created conditions that support Russia's *great power* strategy. It has stirred "nationalist forces" helping consolidate political power and cementing domestic support behind the Putin regime, and against the West. [59] This has sanctioned considerable

---

[55] Anichkina, T., Peczeli, A., & Roth, N. "The future of US–Russian nuclear deterrence and arms control." *Bulletin of the Atomic Scientists* 73, no. 4 (June 2019): 271-278. https://doi.org/10.1080/00963402.2017.1338046.

[56] A. Katona, A, "NATO Territorial Ballistic Missile Defence and its Implications for Arms Control." *The Nonproliferation Review* 22, no. 2 (February 2016): 255, https://doi.org/10.1080/10736700.2015.1117314. The Mk 41 launcher can quickly be configured to hold the BGM-109 TLAM Tomahawk cruise missile.

[57] C.K. Bartles, "Russian Threat Perception and the Ballistic Missile Defence System." *The Journal of Slavic Military Studies* 30, no. 2 (April 2017): 155-157, https://doi.org/10.1080/13518046.2017.1307016; A. Katona, A, "NATO Territorial Ballistic Missile Defence and its Implications for Arms Control." *The Nonproliferation Review* 22, no. 2 (February 2016): 256, https://doi.org/10.1080/10736700.2015.1117314.

[58] Thomas Karako, Ian Williams, and Wes Rumbaugh. *Missile Defence 2020: Next Steps for Defending the Homeland* (Washington, D.C.: Center For Strategic & International Studies, 2017): 104-122, http://missilethreat.csis.org/wp-content/uploads/2017/04/170406_Karako_MissileDefense2020_Web.pdf.

[59] R. Weitz, "Illusive Visions and Practical Realities: Russia, NATO and Missile Defence." *Survival: Global Politics and Strategy* 52, no. 4 (July 2010): 105, https://doi.org/10.1080/00396338.2010.506824; B. Payne, and John S. Foster, "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 8, https://doi.org/10.1080/01495933.2017.1277121.

investments in Russia's military-hard power, increasing its defence budget from 1.5 trillion rubles in 2011 to 2.75 trillion in 2014.[60] This investment has a reciprocating effect on public opinion. The "advanced new weapons, seen now on Russian T.V., feeds the confidence and pride of Russians."[61]

Russia's rebalancing of its hard power under the veil of the BMD threat has strengthened Russia's nuclear deterrent. [62] Russia's deterrent is a major component of its *great power* status. Russians view "nuclear weapons as symbols of greatness and power, and [are] highly-visible examples of Russian strength and self-reliance."[63] Improving its deterrent amplifies the effect. Moreover, the "impression of nuclear-strategic parity with the United States has spillover diplomatic benefits" emphasizing Russia's renewed status as a major power. [64]

These developments have fulfilled a number of Russia's *great power* objectives. First, its hard power rebalancing, investments, and provocative posturing have increased its international prestige. That is to say, Russia is now a credible major power, which is positioning to "displace the unipolar U.S. dominance of the post-Cold War years."[65]

Second, it disrupts European unity and has the potential to weaken NATOs resolve. BMD and the associated ABM and INF treaty withdrawals have triggered increased Russian

---

[60] M. Tsypkin, "Russia, America and missile defence." *Defence & Security Analysis* 28, no. 1 (April 2012): 58, https://doi.org/10.1080/14751798.2012.651379.

[61] *Ibid.*

[62] S.J. Cimbala, S. J, "Unblocking inertia: US-Russian nuclear arms control and missile defences." *Defence & Security Analysis* 32, no. 2 (April 2016): 186, https://doi.org/10.1080/14751798.2016.1160485.

[63] B. Payne, and John S. Foster, "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 49, https://doi.org/10.1080/01495933.2017.1277121.

[64] S.J. Cimbala, S. J, "Unblocking inertia: US-Russian nuclear arms control and missile defences." *Defence & Security Analysis* 32, no. 2 (April 2016): 118, https://doi.org/10.1080/14751798.2016.1160485.

[65] *Ibid.*

bluster that emphasizes the nuclear targeting of various European targets.[66] It's suggested that this is intended to "appeal to European fears that Americans are always fomenting arms races and dragging Europe into them…."[67] This bluster is amplified by 45 years of Cold War which has left deeply-rooted European fears of war, especially nuclear war with Russia.[68] Russia's annexation of Crimea and its interference in Ukraine are further reminders adding credibility to Russian threats.

Finally, Russia's reassertion of power will financially and militarily strain the U.S. Indeed, Russia is not in a position to directly challenge U.S. hegemony, but it can raise the cost. History best illustrates this point. The Americans, during the Cold War, responded to Soviet missile defence with the Multiple Independent Re-entry Vehicle (MIRV). The MIRV provided a relatively affordable 5000 warhead response to the 100 Soviet interceptors.[69] Similarly, the Soviets met the Strategic Defence Initiative (SDI) by "developing the MIRV-capable Topol-M ICBM," which could be fielded much quicker and was much less expensive than SDI.[70] Call it déjà vu, but a similar situation now afflicts BMD.

America is faced with a dilemma. It must keep pace with new Russian capabilities while at the same time progressing BMD. BMD has captured the imagination of politicians with promises of protecting the homeland from ballistic missile threats. This false sense of security ensures that BMD will retain an unnecessarily large percentage of the U.S. defence budget,

---

[66] W.B. Slocombe, "Europe, Russia and American Missile Defence." *Survival: Global Politics and Strategy* 50, no. 2 (March 2008): 21, https://doi.org/10.1080/00396330802034200.

[67] *Ibid.*

[68] B. Payne, and John S. Foster, "Russian strategy Expansion, crisis and conflict." *Comparative Strategy* 36, no. 1 (2017): 36-42, https://doi.org/10.1080/01495933.2017.1277121.

[69] Steff Reuben, *Strategic Thinking, Deterrence and the US Ballistic Missile Defence Project: From Truman to Obama.* (London: Routledge, 2013), 107.

[70] *Ibid.*

which on average stands at $9-$10bn annually.[71] America has other defence problems. It has significant military modernization aspirations, [72] but its national debt stands at more than $22 trillion.[73] These are substantial financial stressors that will be further aggravated by a re-assertive Russia.

Conclusion

Russia is seeking to re-establish its *great power* status. Its strategy involves the reestablishment of Russian power and influence within the borders of the old Soviet Union and reclaiming its place as a European power. Ballistic Missile Defence supports Russia's *great power* ambitions because it presents a convincing threat narrative that preys on deeply entrenched Russian fears of Western domination. This fear helps to consolidate political power and domestic support behind the Putin regime, enabling significant military investment and justifying provocative posturing.

Despite contradictory evidence, Russia maintains that the long-term intent of Ballistic Missile Defence is to degrade its nuclear deterrent. It is another instance of Western collusion, intent on weakening Russia. However, as the evidence has shown, BMD does not pose a threat to Russia's nuclear deterrent. Nonetheless, Russia has successfully weaponized the imaginary threat of BMD, which consequently has advanced its *great power* strategy. It has increased its international prestige; Russia is now considered a major power and credible threat to the U.S. It

---

[71] Steff Reuben, *Strategic Thinking, Deterrence and the US Ballistic Missile Defence Project: From Truman to Obama.* (London: Routledge, 2013), 109.

[72] Market Watch, "The U.S.'s weapons of the future, including the B-21 Raider, push technology into new areas," last accessed 19 May 2019, https://www.marketwatch.com/story/the-uss-weapons-of-the-future-push-technology-into-new-areas-2018-02-21.

[73] U.S. Department of the Treasury, Bureau of the Fiscal Service, "The Debt to the Penny and Who Holds It," last accessed 19 May 2019, https://www.treasurydirect.gov/NP/debt/current.

has stressed European unity, undermining American influence, giving Russia a fissure to exploit. Finally, it has backed the United States into a fiscal corner that will limit its capabilities and ambitions, possibly weakening America's commitment to Europe. Indeed, BMD, the nonsensical fantasy of anxiety-stricken politicians has given Russia a near-perfect backdrop for its *great power* ambitions.

Bibliography

Acton, J. M. "Hypersonic Boost-Glide Weapons." *Science & Global Security The Technical Basis for Arms Control, Disarmament, and Nonproliferation Initiatives* 23, no.3 (October 2015): 191-219. https://doi.org/10.1080/08929882.2015.1087242.

After Ukraine, Countries That Border Russia Start Thinking About Nuclear Deterrents. *Newsweek,* 15 April 2014. https://www.newsweek.com/2014/04/25/after-ukraine-countries-border-russia-start-thinking-about-nuclear-deterrents-248133.html.

Anichkina, T. "Limit missile defence—or expand it?" *Bulletin of the Atomic Scientists* 71, no. 2 (November 2015): 17-20. https://doi.org/10.1177/0096340215571903.

Anichkina, T., Peczeli, A., & Roth, N. "The future of US–Russian nuclear deterrence and arms control." *Bulletin of the Atomic Scientists* 73, no. 4 (June 2019): 271-278. https://doi.org/10.1080/00963402.2017.1338046.

Arbatov, A. "The vicissitudes of Russian missile defence." *Bulletin of the Atomic Scientists* 74, no. 4 (June 2018): 227-237. https://doi.org/10.1080/00963402.2018.1486595.

Bartles, C. K. "Russian Threat Perception and the Ballistic Missile Defence System." *The Journal of Slavic Military Studies* 30, no. 2 (April 2017): 152-169. https://doi.org/10.1080/13518046.2017.1307016.

Barton, K., Falcone, R., Kleppner, D., Lamb, F.K., Lau, M.K., Lynch, H.L, Moncton, D., Montague, D., Mosher, D.E., Priedhorsky, W., Tigner, M., and Vaughan, D.R. "Report of the American Physical Society Study Group on Boost-Phase Intercept Systems for National Missile Defence: Scientific and Technical Issues." *American Physical Society* (13 October 2004): 1-424. https://journals.aps.org/rmp/pdf/10.1103/RevModPhys.76.S1.

Bin, L. "China's attitudes toward missile defence and its limitation." *Bulletin of the Atomic Scientists* 74, no. 24 (June 2018): 243-247. https://doi.org/10.1080/00963402.2018.1486601.

U.S. State Department. *Briefing on the Intermediate-Range Nuclear Forces Treaty (INF).* Washington: Federal Information &News Dispatch, Inc, 2018.

Butfoy, A. "Offence-defence theory and the security dilemma: The problem with marginalizing the context." *Contemporary Security Policy* 18, no. 3 (September 2007): 38-58. https://doi.org/10.1080/13523269708404168.

Butt, Y. "The myth of missile defence as a deterrent. *Bulletin of the Atomic Scientists*, 08 May 2010. https://thebulletin.org/2010/05/the-myth-of-missile-defense-as-a-deterrent/.

Cimbala, S. J. "Russia's Strategic Nuclear Deterrent: Realistic or Uncertain?" *Comparative Strategy* 26, no. 3 (August 2007): 185-203. https://doi.org/10.1080/01495930701454413.

Cimbala, S. J. “Unblocking inertia: US-Russian nuclear arms control and missile defences.” *Defence & Security Analysis* 32, no. 2 (April 2016): 115-128. https://doi.org/10.1080/14751798.2016.1160485.

Cimbala, S. J. “Putin and Russia in retro and forward: the nuclear dimension.” *Defence & Security Analysis* 33, no. 1 (March 2017): 57-67. https://doi.org/10.1080/14751798.2017.1289636.

Corridors of Power; U.S. missile defence radars covering practically all of Russia - Defence Ministry. *Interfax : Russia & CIS Defence Industry Weekly*, 13 October 2017, https://search.proquest.com/docview/1955997723?accountid=10524.

United States. Department of Defence Missile Defence Agency. *Missile Defence: The First Seventy Years.* Retrieved from https://www.mda.mil/global/documents/pdf/first70.pdf.

Diesen, G., & Keane, C. “Constraining missile defence.” *Defence & Security Analysis* 32, no. 2 (March 2016): 129-143. https://doi.org/10.1080/14751798.2016.1160487.

Dill, C., & Pollack, J. *Five myths about missiles*. Retrieved March 2019, from The Washington Post: https://www.washingtonpost.com/outlook/five-myths/five-myths-about-missiles/2017/08/18/1a93967c-835a-11e7-902a-2a9f2d808496_story.html?utm_term=.dc4a2f3d20bb.

Erwin, S. “Next steps for the Pentagon’s new space sensors for missile defence.” *Space News,* 21 January 2019, https://spacenews.com/next-steps-for-the-pentagons-new-space-sensors-for-missile-defense/.

Evans, D., & Schwalbe, J. “Intercontinental Ballistic Missiles and Their Role in Future Nuclear Forces.” *Air & Space Power Journal* 32, no. 2 (May 2018): 37-49. https://www.airuniversity.af.edu/ASPJ/Display/Article/1515246/volume-32-issue-2-summer-2018/.

Gibilterra, J. “Conditional Deterrence and Missile Defence.” *Comparative Strategy* 35, no. 1 (February 2015): 64-73. https://doi.org/10.1080/01495933.2014.962976.

Gottemoeller, R. “Looking Back: The Intermediate-Range Nuclear Forces Treaty.” *Arms Control Today, 37*(5), 41, https://www.armscontrol.org/aca/333.

Grego, L. “US Ground-based midcourse missile defence: Expensive and unreliable.” *Bulletin of the Atomic Scientists* 74, no. 4 (June 2018): 220-226. https://doi.org/10.1080/00963402.2018.1486592.

Lewis, G., & Frank von Hippel. “Improving U.S. Ballistic Missile Defence Policy.” *Arms Control Today* (May 2018): 16-22. https://www.armscontrol.org/act/2018-05/features/improving-us-ballistic-missile-defense-policy.

Houghton, D. P. "The Role of Self-Fulfilling and Self-Negating Prophecies in International Relations." *International Studies Review* (2009): 552-584.

Johnson-Freese, J., & Burbach, D. T. "The Best Defence Ever? Busting Myths about the Trump Administration's Missile Defence Review." *War on the Rocks; Texas National Security Review* (February 2019) retrieved from: https://warontherocks.com/2019/02/the-best-defense-ever-busting-myths-about-the-trump-administrations-missile-defense-review/.

Karako, Thomas. "Homeland missile defence: How the United States got here." *Bulletin of the Atomic Scientists* 73, no 3 (April 2017): 159-166. https://doi.org/10.1080/00963402.2017.1315035.

Karako, Thomas, Ian Williams, and Wes Rumbaugh. *Missile Defence 2020: Next Steps for Defending the Homeland.* Washington, D.C.: Center For Strategic & International Studies, 2017. http://missilethreat.csis.org/wp-content/uploads/2017/04/170406_Karako_MissileDefense2020_Web.pdf.

Katona, A. "NATO Territorial Ballistic Missile Defence and its Implications for Arms Control." *The Nonproliferation Review* 22, no. 2 (February 2016): 253-272. https://doi.org/10.1080/10736700.2015.1117314.

Kearn, David W. Jr. "The hard truths about soft power." *Journal of Political Power* 4, no. 1 (April 2011): 65-85.

Kim, I., & Park, S. "Deterrence under nuclear asymmetry: THAAD and the prospects for missile defence on the Korean peninsula." *Contemporary Security Policy* 40, no.2 (December 2018): 165-192. https://doi.org/10.1080/13523260.2018.1558750.

Kristensen, Hans M. and Matt Korda. "Russian nuclear forces 2019." *Bulletin of the Atomic Scientists* 75, no. 2 (March 2019): 73-84. https://doi.org/10.1080/00963402.2019.1580891.

Kroenig, M. "How to approach nuclear modernization?" *Bulletin of the Atomic Scientists* 71, no. 2 (November 2017): 16-18. https://doi.org/10.1177/0096340215581356.

Lewis, G., & Frank von Hippel. "Limitations on ballistic missile defence—Past and possibly future." *Bulletin of the Atomic Scientists* 74, no.4 (June 2018): 199-209. https://doi.org/10.1080/00963402.2018.1486575.

Lewis, J. "Putin's Doomsday Machine." *Foreign Policy,* 12 November 2015, https://foreignpolicy.com/2015/11/12/putins-doomsday-machine-nuclear-weapon-us-russia/.

Lewis, J. "Putin's Nuclear-Powered Cruise Missile Is Bigger Than Trump's." *Foreign Policy,* 01 March 2018, https://foreignpolicy.com/2018/03/01/putins-nuclear-powered-cruise-missile-is-bigger-than-trumps/.

Market Watch. “The U.S.’s weapons of the future, including the B-21 Raider, push technology into new areas.” Last accessed 19 May 2019. https://www.marketwatch.com/story/the-uss-weapons-of-the-future-push-technology-into-new-areas-2018-02-21.

Mecklin, J. “Introduction: The great missile defence dilemma.” *Bulletin of the Atomic Scientists* 74, no. 4 (July 2018), 197-198, https://doi.org/10.1080/00963402.2018.1486571.

Mehta, A. “3 thoughts on hypersonic weapons from the Pentagon’s technology chief.” *Defence News*, 16 July 2018, https://www.defensenews.com/air/2018/07/16/3-thoughts-on-hypersonic-weapons-from-the-pentagons-technology-chief/.

Mizokami, K. “Russia’s New Hypersonic Missile Travels Nearly Two Miles a Second.” *Popular Mechanics*, 26 December 2018, https://www.popularmechanics.com/military/research/a25684396/zircon-hypersonic-missile/.

Mount, A. “Adapting nuclear modernization to the new administration.” *Bulletin of the Atomic Scientists* 73, no. 3 (April 2017): 167-172. https://doi.org/10.1080/00963402.2017.1315036.

Norris, H. M. “Russian nuclear forces, 2017.” *Bulletin of the Atomic Scientists* 73, no. 2 (February 2017): 115-126. https://doi.org/10.1080/00963402.2017.1290375.

United States. Department of Defence. *Missile Defence Review.* Washington, D.C.: Office of the Secretary of Defence, 2019. https://www.defense.gov/Portals/1/Interactive/2018/11-2019-Missile-Defense-Review/The%202019%20MDR_Executive%20Summary.pdf

Payne, B. and John S. Foster. “Russian strategy Expansion, crisis and conflict.” *Comparative Strategy* 36, no. 1 (2017): 1-89. https://doi.org/10.1080/01495933.2017.1277121.

Riqiang, W. “Limit missile defence—or expand it?” *Bulletin of the Atomic Scientists* 71, no. 2 (November 2015): 9-12. https://doi.org/10.1177/0096340215571900.

Rogoway, T. “Russia Tests Another Anti- Satellite Weapon as Battleground Space Looms.” *The WarZone*, 21 December 2016. https://www.thedrive.com/the-war-zone/6631/russia-tests-another-anti-satellite-weapon-as-battleground-space-looms.

Rogoway, T. “Russia Breaks Arms Control Treaty by Deploying Land-Based Cruise Missile.” *The WarZone,* 14 February 2017. https://www.thedrive.com/the-war-zone/7666/russia-breaks-arms-control-treaty-by-deploying-land-based-cruise-missiles.

Rogoway, T. “Missile Defence Madness: Myth of Perfect Patriots, Magic THAAD, and The ICBM Shield.” *The War Zone*, 04 December 2017. https://www.thedrive.com/the-war-zone/16652/missile-defense-madness-myth-of-perfect-patriots-magic-thaad-and-the-icbm-shield.

Rogoway, T. “This Primer On Midcourse Intercept Ballistic Missile Defence Is Marvelous.” *The War Zone,* 09 January 2019. https://www.google.com/search?client=safari&rls=en&q=This+Primer+On+Midcourse+Intercept+Ballistic+Missile+Defense+Is+Marvelous&ie=UTF-8&oe=UTF-8.

Reuben, Steff. *Strategic Thinking, Deterrence and the US Ballistic Missile Defence Project: From Truman to Obama.* London: Routledge, 2013.

Russia's Violation of the Intermediate-Range Nuclear Forces (INF) Treaty. U.S. State Department. Washington, DC: Federal Information &News Dispatch, Inc. 04 December 2018.

Sankaran, J. “The United States’ European Phased Adaptive Approach Missile Defence System; Defending Against Iranian Threats Without Diluting the Russian Deterrent.” *RAND National Security Research Division*. RAND Corporation, 2015. https://www.rand.org/content/dam/rand…

Sessler, Andrew M., Cornwall, John M., Dietz, Bob., Fetter, Steve., Frankel, R., Garwin, Richard L., Gottfried, Kurt., Gronlind, Lisbeth., Lewis, George N., Postol, Theodore A., and Wright, David C. *Countermeasures: A Technical Evaluation of the Operational Effectiveness of the Planned US National Missile Defence System*. Cambridge: Union of Concerned Scientists, 2000. https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/cm_all.pdf.

Slocombe, W. B. “Europe, Russia and American Missile Defence.” *Survival: Global Politics and Strategy* 50, no. 2 (March 2008): 19-24. https://doi.org/10.1080/00396330802034200.

Szondy, D. “The truth about Satan: Nuclear war in the 21st century.” *News Atlas*, 15 March 2017, https://newatlas.com/nuclear-weapons-satan-missile/46845/.

Tertrais, B. “Russia’s Nuclear Policy: Worrying for the Wrong Reasons.” *Survival; Global Politics and Strategy* 60, no.2 (March 2018): 33-44. https://doi.org/10.1080/00396338.2018.1448560.

Trenin, D. “Russian views of US nuclear modernization.” *Bulletin of the Atomic Scientists* 75, no. 1 (January 2019): 14-18, https://doi.org/10.1080/00963402.2019.1555991.

Trevithick, J. “Russia Fires Topol Ballistic Missile to Test New Tech to Defeat Missile Defence Systems.” *The WARZONE*, 26 December 2017, http://www.thedrive.com/the-war-zone/17197/russia-fires-topol-ballistic-missile-to-test-new-tech-to-defeat-missile-defense-systems.

Trevithick, J. “Here's All You Need To Know About The New Missile Defence Review That Was Just Released.” *The WARZONE, 17 January 2019,* https://www.thedrive.com/the-war-zone/26020/heres-all-you-need-to-know-about-the-new-missile-defense-review-that-was-just-released.

Tsypkin, M. “Russia, America and missile defence.” *Defence & Security Analysis* 28, no. 1 (April 2012): 55-64. https://doi.org/10.1080/14751798.2012.651379.

Union of Concerned Scientists. "Countermeasures (2000)." Last accessed 15 April 2019. https://www.ucsusa.org/nuclear-weapons/us-missile-defense/countermeasures.

U.S. Department of the Treasury, Bureau of the Fiscal Service. "The Debt to the Penny and Who Holds It." Last accessed 19 May 2019. https://www.treasurydirect.gov/NP/debt/current.

Weitz, R. "Illusive Visions and Practical Realities: Russia, NATO and Missile Defence." *Survival: Global Politics and Strategy* 52, no. 4 (July 2010): 99-120. https://doi.org/10.1080/00396338.2010.506824.

Wilkening, D. A. "Does Missile Defence in Europe Threaten Russia?" *Survival: Global Politics and Strategy,* 54 no.1 (Jan 2012): 31-52. https://doi.org/10.1080/00396338.2012.657531.

Wolverton, M., & Postol, T. (2017, March 27). "The Myth of Missile Defence." *World Beyond War*, 27 March 2017. https://worldbeyondwar.org/myth-missile-defense/.

Zadra, R. "NATO, Russia and Missile Defence." *Survival, Global Politics and Strategy 56, no.*4 (July 2014): 51-61. https://doi.org/10.1080/00396338.2014.941555.