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**THE IMPACT OF NATO'S BALLISTIC MISSILE DEFENSE EFFORTS ON THE
RELATIONSHIP WITH RUSSIA**

A Master's Thesis

Presented to

The Graduate College of
Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Defense and Strategic Studies

By

Christian Hofmann

May 2022

THE IMPACT OF NATO'S BALLISTIC MISSILE DEFENSE EFFORTS ON THE RELATIONSHIP WITH RUSSIA

Defense and Strategic Studies

Missouri State University, May 2022

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Christian Hofmann

ABSTRACT

Strategic missile defense or anti-ballistic missile (ABM) systems are considered deterrence by denial assets. The debate on the question if these systems stabilize or destabilize the balance of power between nuclear powers is still unresolved. This work reviews this impact using the example of the East – West relationship by focusing on NATO's missile defense efforts. This is done in two parts. The first is a historical part, reviewing the East – West relationship during the Cold War based on strategic arsenals, crisis events and arms control talks related to missile defense developments. The second part reviews the development since the year 2000, using again strategic arsenals, crisis events, arms control talks as well as a comparison of missile defense of NATO and the Russian Federation. Neither the historical analysis nor the current situation analysis show a significant escalation-causing character of ABM systems. Especially in the historical view, ABM systems appear to have had a stabilizing effect. However, each development in missile defense creates a picture of a future where the technological advantage of an adversary could outpace offensive capabilities, degrading the offensive capabilities of a nation. The current situation shows in detail that such a future never took form and likely won't for the foreseeable future. It shows how immense the disadvantage of a defender against a nuclear attack would be. There are physical constraints to position interceptors to be able to successfully intercept a missile. More importantly the cost of one intercept is significantly higher than the cost of an attacking missile. These constraints make the development and deployment of missile defense against a major Russian missile attack almost impossible. Russia, on the opposite side, communicates about missile defense primarily when trying to create a picture of NATO as an aggressor trying to mitigate Russia's rightful ability for nuclear defense. This narrative is completely false. Russia is not the main target for NATO's missile defense efforts and is only to a very limited degree influenced by the systems. Current missile defense systems contribute on two levels to stability. Firstly, deterrence by denial towards rogue regimes that don't have the capabilities to overcome the defense. Secondly, by creating the ability to stop an accidental launch. Missile defense should therefore not be subject to restrictive arms control treaties.

KEYWORDS: missile defense, deterrence, deterrence by denial, NATO, Russian Federation, international relationship, arms control

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In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

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INTRODUCTION

Tension has been building in NATO's relationship with Russia since 1995. The East-West conflict of the Cold War had been replaced for a short time by Russian internationalism after the fall of the Soviet Union. The dream for lasting cooperation did not last long and the relationship deteriorated after a short time due to divergent positions. The different views became apparent during events such as the Bosnian War or the Kosovo War. The culminating point was the Russian Invasion of Ukrainian provinces, destabilizing Europe's east. Earlier, Russia had attacked Georgia in 2008 and carried out cyber-attacks on Estonia's IT-system in 2007. In the process leading up to and accompanying the invasion, Russia created a significant amount of disinformation campaigns in addition to non-conventional procedures to attack Ukraine and seize Crimea causing the world to see a new version of conflict which is called "hybrid-warfare." One aspect of Russia's Information Operations is to put blame on NATO as the aggressive opponent.¹ Part of Russia's narrative was to paint NATO's ballistic missile defense (BMD) effort as part of a Western plan to threaten Russia's role as a global power.² The one treaty on anti-ballistic missile (ABM) defense was the United States and Soviet Union ABM treaty of 1972, from which the U.S. withdrew in 2002 in accordance with the treaty to establish a national missile defense system. The plan was to protect the U.S. against potential future threats from rogue regimes such as North Korea or Iran, which would acquire long range missile capabilities.³ The system would later include a footprint in Europe to increase protection against

¹Lesley Kucharsky, *Russian Multi-Domain Strategy against NATO: information confrontation and U.S. forward-deployed nuclear weapons in Europe*, (2018) 23.

²Ibid.

³Elenor Albert. 'North Korea's Military Capabilities', (2020).

Iran. The system, however, received a lot of attention from the Russian Federation and repeatedly became the object of public Russian statements. The repeated connotation of U.S. missile defense efforts as something hostile and part of NATO aggression in Russian communication indicate a potential impact of ABM defenses on the East-West relationship.

Within this context it seems to be relevant to qualify, and if possible, quantify the impact ABM has on this relationship. Do ABMs enhance strategic stability between adversaries by protecting forces and increasing a nation's deterrence capabilities, or do they threaten stability by eroding the equilibrium created by vulnerability to offensive nuclear capabilities? How has the impact changed from the Cold War era to the 21st century setting of hybrid warfare?

Therefore, the following work will try to contribute to an analysis of the impact ABMs had in the past to an understanding of strategic stability and will allow an assessment for the future. After providing a comprehensive overview of missile defense in general, an overview of the impact of missile defense within the framework and concepts of deterrence will be presented. The discussion of deterrence will be focused on nuclear deterrence and leave conventional deterrence aside. After an overview on general concepts, this paper will establish the impact of ballistic missile defense in different phases of the historical East-West relationship during the Cold War. Finally, the current NATO missile defense efforts will be described and analyzed in the context of the NATO – Russia relationship to identify a potential impact of missile defense on that relationship. This will lead to recommendations on supporting missile defense efforts, should NATO desire to proceed. The aim of this thesis is to analyze the impact of ballistic missile defense and to determine if missile defense destabilizes strategic stability. For this analysis of the missile defense impact on the NATO- Russia-relationship, historical comparisons, legal frameworks, official and state-related statements, and significant events (as baseline

indicators) will be used to assess the quality of this impact. The numbers of strategic nuclear arsenals, launching systems, and trends in their developments will additionally serve as indicators for the impact of missile defense.

BALLISTIC MISSILE DEFENSE IN GENERAL

The term ballistic missile defense (BMD) describes a variety of different military and civilian concepts and technology. BMD includes the technology, systems, and procedures to defeat the impact of ballistic missiles before they hit their target. BMD systems consist of command-and-control structures, sensors (i.e., radar units) and effect causing units (i.e., interceptor missile launchers). Their aim is to destroy the incoming missile before it hits the designated target. BMD can be characterized by its impact on the destruction of incoming missiles – strategic, operational, tactical as well as cruise missiles. Missile defense systems are designed to work within specific ranges of targets. Focusing on certain characteristics of various BMD systems they are applicable against various deadly incoming ballistic and cruise missiles. BMD systems can be combined with ground forces to destroy short and medium-range missiles and give the ground forces greater freedom of movement and protection.

The assets that comprise the missile defense system can be either land-based, sea-going, air, or space-based systems. Currently, there are systems in operation that utilize no space-based interceptors. The 1967 Outer Space Treaty (OST) prohibits the placement of nuclear and other weapons of mass destruction and limits the orbit to peaceful use, which refers to non-aggression as opposed to non-military use.⁴ Thus, space-based interceptors would be permitted under the OST. Air assets that can intercept ballistic missiles fulfill this task commonly as a secondary role besides their main air combat task. The USAF and later the Missile Defense Agency conducted research on airborne laser BMD capabilities. The intercontinental ballistic missile (ICBM)-kill

⁴Pamela Meredith, 'The Legality of a High Technology Missile Defense System: The ABM and Outer Space Treaty. 1984', *The American Journal of International Law* Vol. 78 No. 2 (April 1984) 423.

role was considered, for example, for the F-35 jet by the Pentagon.⁵ Sea and land-based systems are the two most common domains from which missile defense systems operate.

Categorization

Missile defense systems can be categorized along different parameters like the technology used for sensors and interceptors. These systems work either projectile-based, missile-based, or energy-based. Energy beam-based systems are still in the phase of development and only prototypes have been used to progress the research.⁶ Missile defense systems can also be categorized by interceptor technology employed or by the flight phase in which they intercept. As this thesis focusses on strategic systems the characterization along the categories of tactical, operational/ theater, and strategic ballistic missile defense systems is further described.

Tactical Missile Defense. Short range characterizes most tactical anti-ballistic missile systems. Their goal is to defend a small area like field camps or smaller size forces against the threat of tactical ballistic missiles. With their short-range and low effector speed, their impact in a conflict may be limited. They often work against rockets and short range cruise and ballistic missiles. An example of a tactical missile defense system (or SHORAD as it is known) is MANTIS systems (Modular, Automatic and Network capable Targeting and Interception System), a field camp defense system. This system works based on fixed radar and anti-air-gun towers in the perimeter of a field camp. It provides protection against rockets, artillery and mortar (RAM) fire. The counter-RAM capability will be expanded in the future to counter short

⁵Valerie Insinna. 'Pentagon considers an ICBM-killing weapon for the F-35, but is it affordable?', (2019).

⁶Thomas Karako, Ian Williams, and Wes Rumbaugh, Missile Defense 2020 April 2017 Next Steps for Defending the Homeland (Rowmann&Littlefield April 2017), 112.

range ballistic missiles by deploying interceptor missiles.⁷

Operational/Theater Missile Defense. Operational or theater missile defense systems aim to protect military assets of high value or large areas against missiles with greater range, speed, and payload. These systems use missiles to intercept incoming enemy ballistic or cruise missiles. The Terminal High Altitude Area Defense (THAAD) and PATRIOT missile defense systems are examples of theater missile defense systems in this category. PATRIOT played a key role in selected spaces along the Turkish border during Operation Active Fence -since 2013- to reassure Turkey and defend its border region against the possible threat of Syrian ballistic missiles.

Strategic Missile Defense. Strategic-level ballistic missile defense systems work against long-range intercontinental ballistic missiles. They impact an adversary's ability to reach key command and control structures, cities, military bases, and nuclear strike capabilities. These systems use missiles to intercept, and sometimes even use nuclear payloads to deflect incoming missiles.

There is no strict line along which these systems must be classified. The deployment of a system and the environment in which it is used can influence classification and perception. The Iron Dome for example, aims against Kazham short-range missiles used by HAMAS forces and would therefore classify as theater missile defense system. However, Israel sees the system as strategic due to the protection it provides for its population.⁸

For this thesis, the focus will stay on strategic missile defense systems that target intermediate-to-long-range intercontinental ballistic missiles carrying nuclear payloads.

⁷Justyna Gotkowska, 'The current state, problems and future of Germany's air and missile defense', *OSW Commentary* No 105 (April 10, 2013) 3.

⁸Jerusalem Post, 'Vilnai: Israel has strategic reason not to use Iron Dome', *Jerusalem Post*, March 24, 2011.

Point of Interception

An adversary can impact a ballistic missile in different stages of an attack. The phases are off the launcher, on the launcher, in the boost phase, mid-course, and terminal phase.

Left of Launch. All phases before the targeted missile is launched are called left-of-launch-phases. They usually are not targets of ballistic missile defense systems which are designed to target missiles in flight.

Theoretically, it would be possible to include even earlier phases such as development and production to impact an adversary's ability to hit a target with ballistic missiles successfully. Considerations about these early phases fall mainly into the realm of arms/technology control and are not further analyzed in this work.

Other weapon systems, which could fulfill a missile defense role and destroy a missile left of launch, with the exception of space-based laser technology, will not be included in the discussion of the thesis to keep the focus on missile defense systems as a primary task.

Boost Phase and Ascent. The next phase in which a ballistic missile can be impacted is in the boost phase when it starts its trajectory with an extreme accelerator to reach travel height and direction. Besides the obvious possibility of destruction in this phase, there is the possibility to disrupt the planned trajectory by influencing the boost phase, leading to a reduction or loss of accuracy.

Mid-Course. This phase accounts for most of the distance traveled by ballistic missiles. After the boost phase sets the general course of the missile, the missile approaches its target. This consists mainly of exo-atmospheric travel time for long-range missiles before initiating the terminal phase by reentering the atmosphere again. In this phase, the threat of interception for ballistic missiles is not significantly increased even though it follows a predictable and steady

trajectory. Especially for long-range missiles, a significant part of this phase stays beyond most defense systems' range. Current long-range systems (U.S.) were developed to overcome this challenge and target missiles in their midcourse flight phase. The flight height above the atmosphere keeps them out of range for many defense systems.⁹

Terminal-Phase. The terminal phase starts with the final approach to reach a target. In this phase long-range nuclear missiles are splitting their multiple reentry vehicles apart and begin their descent into the atmosphere to reach their ground located targets. Terminal-phase intercepts of ballistic missiles are the most commonly used approach to missile defense by non-strategic system.¹⁰ Within this phase, the final approach trajectory of a missile can be calculated. Most missiles do not have systems to change their trajectory in this phase, and even if they can change their trajectory, the overall impact is insignificant to potential changes in mid-course or in the boost phase. The vulnerability of a missile is high in its terminal phase because it is within the optimal range of defense systems, but there are still factors mitigating this vulnerability. In this phase, multiple independently targetable reentry vehicles (MIRVs) give an advantage, if carried by a missile, by forcing a defender to distribute interceptors to multiple targets. Overwhelming a defense system in this phase is more likely than in earlier phases, given the potential use of many targets that either split from fewer missiles or by focusing an attack into a confined space. The moment of reentry adds to the challenges of a defender as the atmospheric interferences hamper radar-sensing. A disadvantage of terminal phase intercepts is the increased probability of collateral compared to earlier phase intercepts. For conventional missile defense, this effect is neglectable, but given the effects of radioactive material or chemical fallout, mitigation of these

⁹Gary A. Sullins, 'Exo-atmospheric Intercepts: Bringing New Challenges to Standard Missile Gary,' *Johns Hopkins APL Technical Digest* Vol. 22 No. 3 (2001) 260.

¹⁰Center for Arms Control and Non Proliferation. 'Fact Sheet: U.S. Ballistic missile Defense', (2021).

effects can be necessary when intercepting missiles with such payloads. Still, an intercept without fallout mitigation is the far better alternative than no intercept.

It is essential to understand the trajectory of missiles, so as to know at which point a missile defense system can intercept this trajectory, in order to fully understand the effectiveness of missile defense systems. Figure 1 shows an example of an ICBM – trajectory in various stages from start to impact, illustrating the distribution of travel time between the phases and the potential distance between a defense system and the launch-point.

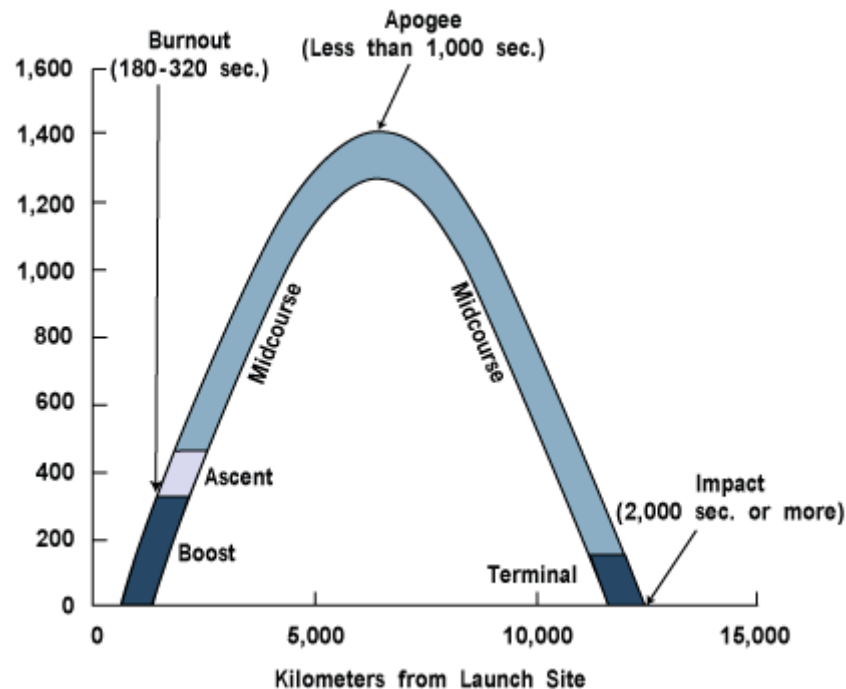


Figure 1. Ballistic Missile Trajectory Characteristic - shows the trajectory of a missile. The trajectory is divided into the Boost phase, Ascent, Midcourse and Terminal Phase.¹¹

This trajectory concept translates to all forms of ballistic missiles with some variations. Silo Based, thus fixed, ICBMs have a defined medium and maximum range, while mobile forces such as mobile ICBMs or SLBMs also do have a minimum and maximum range. However, the

¹¹Steeljaw – Blog. 'ICBM Fundamentals', (2007).

endpoints are not fixed due to the possibility of change in starting point location. By adapting the trajectory, it is possible to create further challenges for missile defense. A flatter trajectory could impose challenges on the tracking systems. Controlled changes of trajectories by engines or control units could evade interceptor missiles. The variations of a missile trajectory (without additional changes in the course) is depicted in figure 2. Most non-strategic missile defense systems are designed to intercept in the terminal phase, and only more advanced systems against long-range missiles target the midcourse phase.

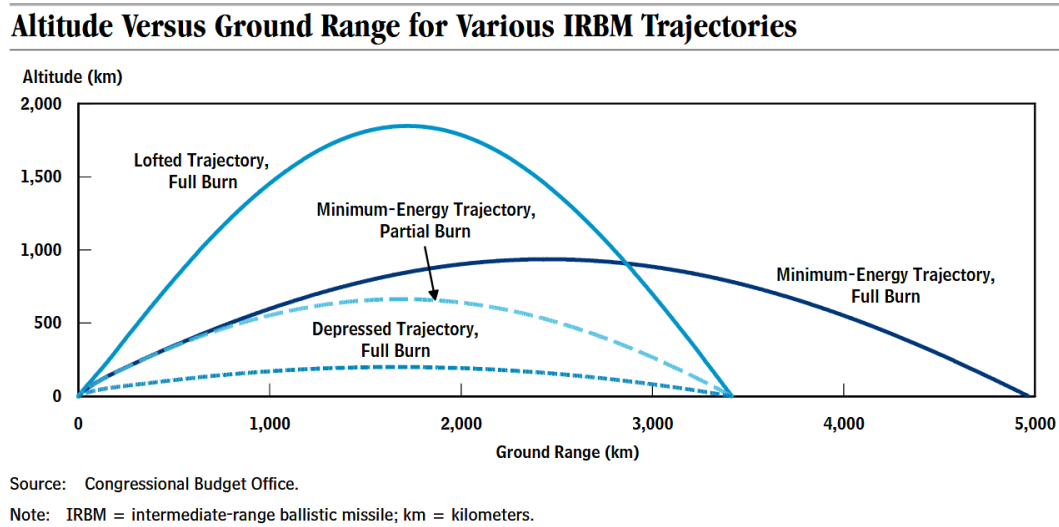


Figure 2. Missile Trajectory Variations - shows the variation of trajectories, which defines the maximum and minimum range of a ballistic missile.¹²

There is currently no system that successfully intercepts in the boost phase. Missile defense systems that engage a target in an early trajectory phase create better protection as they leave the defender with a chance for further attempts to intercept. If an intercept in the terminal phase fails, there is no room for further attempts.

¹²Congressional Budget Office. *A CBO Study - Options for Deploying Missile Defenses in Europe*, (2009), 50.

While the launcher is potentially known, the target can be a matter of judgment and prediction and not always of precise calculation. At the same time, early phase intercepts require significantly advanced technology as an interceptor either has to be very close by or outpace a missile to intercept it early. Longer ranges and greater interceptor speed reduces the needed number of defense system per adversarial launcher, as they enable repeated intercept attempts. Missile defense systems face further challenges by countermeasures that missile attacks utilize to overcome the defense.

Means to counter Ballistic Missile Defense systems

Missile defense countermeasures range from specific methods of attack to technology carried by a ballistic missile. Different methods of attack to counter missile defense systems are approaches like saturation or evasion. Saturation is the concept of employing more missiles than the defender's system can intercept because it does not have enough launchers, the sensor capacity is too low, or sensors with the command and control structure are too slow to assign targets.

Avoidance leaves out a defended area from an attack and aims at a less or undefended target. This method works mainly with counter-value approaches in deterrence, as will be described later. Saturation and avoidance pose the most significant problems for defenders as the attacker decides where to use and how to focus forces; this concept also applies for conventional forces.

Some missiles use an evasion approach based on additional booster rockets to be fired to evade an incoming interceptor or by using endo- or exoatmospheric maneuvers to change trajectory. Stealth technology can also hamper a defender's ability to acquire a target by radar,

thus increasing the survivability of a missile. Decoys are an approach to lead missile defense systems to spend their limited numbers of interceptor missiles, increasing the chance of a successful attack. They often work similarly to aircraft defense systems and fire objects that obfuscate or duplicate heat signatures. The short overview given on missile defense counter measures, while not complete, makes it clear that the defender suffers disadvantages even though Clausewitz defined the defense as the stronger form of war. Modern ballistic missile interceptors are often more expensive than the target they aim at. Even given equal cost the attacker is likely to achieve a successful hit by focusing ballistic missile assets on a limited number of targets as the defender has to spread out the defense or leave some areas undefended.

BALLISTIC MISSILE DEFENCE AND DETERRENCE

The complete discussion about missile defense unfolds around the concepts of deterrence.

Deterrence is the idea to discourage an enemy from taking an unwelcome action by the threat of retaliation that would be unacceptable to the aggressor.¹³ There are two ways to deter an enemy, either by the threat of punishment or by denial measures preventing an enemy from achieving their objectives. “A capability to deny amounts to a capability to defend.”¹⁴ Ballistic missile defense is an asset of deterrence by denial by defending forces or population against a missile attack. By increasing the survivability of forces it adds to the credibility of deterrence by punishment efforts.

Deterrence by punishment is based on the threat of retaliation by force, conventional or nuclear.¹⁵ Deterrence by denial is designed to increase the cost of an attack for a given opponent to an amount that the cost of the attack is, in the end, higher than the potential outcome, thus making the attack unfavorable and more difficult to achieve desired objectives.¹⁶

However, to create a deterrence by denial more than just missile defense is necessary as the denial only works if enough adversarial means to attack are bound to fail. Missile defense can support this approach and be a significant building block especially if an adversary relies primarily on ballistic missiles and has only inferior conventional forces. Within this constellation missile defense could deny an enemy credible escalation steps like limited strikes or even deny strikes on a greater scale. Denying an adversary escalation steps or even their overall approach to attacks could deter an enemy to attack in general. As chances of achieving goals are reduced, the

¹³Michael Rühle. ‘Deterrence: what it can (and cannot) do’, (2015).

¹⁴Michael J. Mazarr, *Understanding Deterrence* (Santa Monica, CA: RAND Corporation 2018).

¹⁵Kestutis Paulauskas. ‘On Deterrence’, (2016).

¹⁶Ibid.

calculated expected gain decreases, which in turn makes the attack too costly in terms of risk and reward. Additionally, already in the set-up process (before full deployment), missile defense systems fulfill add fundamental early warning and intelligence capabilities with their sensors and the data they provide.

Contemporary discussions about deterrence are significantly based around the ideas of *easy* and *difficult* deterrence, where *easy* deterrence defines only force requirements, while the *difficult* deterrence proponents see the need to adapt deterrence to the enemy.¹⁷ The narrative of *easy* deterrence relies heavily on predictability of the escalation of conflict and the required means to deter, thus easy to understand.¹⁸ The narrative of *difficult* deterrence acknowledges that it is potentially dangerous to assume an enemy is acting cautiously because many influence factors are not completely uncovered before it is too late and another escalation happens.¹⁹ The idea of *difficult* deterrence includes recognizing that there is also a potential for deterrence to destabilize if the adversaries' perception is not the intended one.

Herman Kahn introduced the concept of an *escalation ladder* by defining 44 steps of conflict based on a potential conflict of the Soviet Union against the West. At the same time, he acknowledged that his ladder did not take asymmetries in thinking and perception of these steps into account, and other dimensions were excluded from the model that showed conflict only as unidimensional back and forth between steps of violence that could be controlled.²⁰ Herman Kahn's acknowledging asymmetries between adversaries almost makes a case for difficult deterrence. With conflict being a multidimensional net of potential paths, many influence factors

¹⁷Igor Ivanov, 'The Missile-Defense Mistake: Undermining Strategic Stability and the ABM Treaty', *Foreign Affairs* (September/October 2000).

¹⁸Keith B. Payne, 'The Great Divide in US Deterrence Thought', *Strategic Studies Quarterly* Vol. 14 No. 2 (Summer 2020) 18.

¹⁹Keith B. Payne, 'The Great Divide in US Deterrence Thought', 30.

²⁰Paul Davis and Peter Stan, *Concepts and Models of Escalation* (Rand Strategy Assessment Center 1984), 3 – 7.

create asymmetries by lowering or raising escalation thresholds. Arms acquisition and rising military budgets potentially raises the threshold for an adversary to escalate a conflict by contributing to a nation's deterrence capabilities. At the same time, it could push the opponent to perceive the situation as hostile even though the acquisitions are planned for defensive purposes. This perception of the armed defender as preparing for conflict could in turn increase the probability of conflict by creating a perception of rising tension or even offensive plans. Communication and information exchange are key to influence the development of perception and prevent it from becoming hostile.

Damage mitigation measures such as missile defense could raise the threshold as it denies an adversary the chance of a successful attack or mitigates the attack causing the opponent to use far more of his precious assets. Missile defense in this regard has the potential to be stabilizing by showing an adversary that an attack would be of no use or with little chances of success. However, nuclear use, especially by smaller nations, could be triggered by irrational mechanisms; some of these irrational mechanisms could be based on wrong beliefs like using-it-or-lose-it about nuclear weapons.²¹ Even though the concept is wrong as there is no automatism that a conflict partner has to escalate in certain asymmetric situations as the only option necessarily, opponents may be misguided by such concepts. Missile defense potentially plays into this and increases the perceived asymmetry. Therefore, this thesis will analyze the existence of an asymmetry in the relationship of the analyzed conflict participants. Another possibility, as stated above, are other influential factors such as the forward stationing of forces for extended missile defense-based deterrence by denial or the existence of extended deterrence by denial in general.

²¹David Logan. *The Varied Roads to Armageddon - Unpacking the Use-It-Or-Lose-It Dilemma*, (2020), 8.

Both kinds of deterrence measures can be extended to allies. For ballistic missile defense, extension often includes the stationing of missile defense forces, naval vessels, or infrastructure to extend the range of the system to the supported ally's territory. This aspect of extended deterrence by denial/damage mitigation measures makes it vulnerable to narratives of aggression as forces/assets often have to be stationed on the territory of an ally or close by. This could put assets of the deterrence-extending partner closer to an adversary's border. This was a side effect which became apparent when the U.S. thought about extending their missile defense system to Europe to create a mutual defense against Iranian threats. The planned missile defense contained the stationing of U.S. interceptor systems in Poland and the Czech Republic. Such plans created the opportunity for Russia (being the adversary close by) to include it into its communication strategy. The quality of this impact on the NATO – Russia relationship will be discussed later.

U.S. AND NATO'S HISTORIC MISSILE DEFENSE IMPACT

During the Cold War - especially in the beginning when the European theater was still affected by the Second World War, the United States was the main contributor to NATO's non-conventional deterrence measures. This chapter, therefore, will focus mainly on the U.S. developments and how they affected the East-West relations. Other allied developments will be mentioned where they had a significant contribution to NATO's overall missile defense efforts. The historical analysis of the impact of NATO's missile defense on its relationship with the Soviet Union, the predecessor of the Russian Federation, is split into different phases along technological and political changes. For each phase, an overview of the general influence factors on and indicators of the East-West relationship, like crises and treaties will be given to establishing a baseline against which the impact of missile defense can be analyzed. While most crisis, international treaties and negotiations have no direct connection to missile defense, they function as indicators of the underlying status of the East – West relationship. This baseline is important to potentially identify if assumed missile defense effects are covered by trends influencing the situation diametrically or multiplied by supporting trends.

Historical Background

The historical beginning of missile defense is closely connected to the Second World War and the idea to destroy German V1 and V2 rockets before they could hit their targets in Great Britain. V1 rockets could be defeated by interceptors (aircraft) or anti-air guns, while the only possibility to defeat the V2 was to hit it off or on the launcher and not in later trajectory phases

due to the speed of the rocket.²² The issue dropped into the background when atomic weapons ended the Second World War; it came back into view when nuclear payloads found their way into missiles.

1959 Nike

The relationship between the Soviet Union and the Western Allies had been deteriorating in the last phase of the Second World War, but shared interests held it together. This connection wore off, tension rose, and the Cold War had begun. For some time, the United States was the only power capable of manufacturing nuclear weapons, but the Soviet Union worked hard to close this gap. The Soviet Union acquired the capability to deploy nuclear weapons in 1949. The first nuclear test with medium-range ballistic missiles took place in 1953. The missiles had a range between 1000 and 3000 kilometers. Even though these missiles could not reach the U.S. directly, they were able to reach Europe. The path of missile development towards a greater range, speed, and payload was foreseeable. These factors created the conditions for the U.S. and NATO to develop and acquire ballistic missile defense systems.

NATO's defense posture called for a "forward defense strategy," pushing its defenses as far east as possible, stating the need to counter and arrest an enemy offensive "as soon as practicable."²³ A major change was the shift to the concept of massive retaliation in NATO's new strategy of 1957, laying out in MC 14/2 the need for the Soviet Union to know the West is prepared to devastate the Soviet Union with nuclear weapons in case of a general war.²⁴ This need for deterrence based on retaliatory nuclear capabilities was driven by the Western

²²Adam Gruen, *Preemptive Defense Allied Air Power Versus Hitler's V-Weapons, 1943–1945* (1998), 36.

²³NATO Military Committee: *A Report By The Standing Group on Strategic Guidance 14/1* (1952), 17.

²⁴NATO Military Committee: *Final Decision on MC 14/2 (Revised) A Report by the Military Committee on Overall Strategic Concept For The Defense Of The North Atlantic Treaty Organization Area* (1957), 7.

assumption that the Soviet Union would initiate a general war with a nuclear offensive.

In 1958, tension arose over the question of Western Forces stationed in West Berlin, then an enclave in the territory of the German Democratic Republic (GDR). Soviet leader Khrushchev had demanded a withdrawal of Western Forces from Berlin within six months, leading to the activation of U.S. reservists in anticipation of rising conflict. Finally, the GDR built the Berlin Wall and fortified the inner German border beginning on August 13th, 1961, dividing Germany until 1989.²⁵

Around 1960, "as arsenals and delivery systems expanded, [...] both superpowers worried about the others' first strike or defensive capability."²⁶ The U.S. developed the first concept of a Western ballistic missile defense system with the *Nike Zeus* program, which was designed to intercept intercontinental ballistic missiles with a nuclear detonation. Zeus missiles were fired from stationary ramps, making them relatively vulnerable, as shown in figure 3.

It aimed to destroy a limited number of incoming Soviet intercontinental ballistic missiles (ICBM) and create a defense for the entire U.S. mainland.²⁷ This damage mitigation would have added a deterrence by denial method to the United States' established concept of deterrence by punishment alone. With the projected significant increase in Soviet offensive capabilities, until *Nike Zeus* would or could be operational, the threat of Soviet missiles increased to a scale where only a limited defense of objects with strategic importance was possible given a limited budget.²⁸

On top of the anticipated expansion of Soviet nuclear capabilities, there was the perception of already achieved Soviet superiority through in the form of its missile program.

²⁵U.S. Department of State – Office of the Historian. 'The Berlin Crisis 1958–1961', Accessed September 13, 2021.

²⁶Joseph M. Siracusa and Aiden Warren, *Weapons of Mass Destruction The Search For Global Security*, (Lanham: Rowman & Littlefield Publishers 2017), 32.

²⁷Edward N. Luttwak, 'Review of Ballistic Missile Defense by Benson D. Adams', *Policy Sciences* Vol 4 No. 1 (1973) 113.

²⁸Ernest J. Yanarella, *The Missile Defense Controversy* (Lexington: University Press of Kentucky 2020) 80.

This perceived Soviet missile superiority became known as the *Missile Gap*. The discussion of the Missile Gap evolved around differing intelligence estimates by the U.S. Air Force (hundreds of Soviet ICBM by 1960) and the CIA (maximum one dozen).



Figure 3. Zeus Missile Launch – Shows the test firing of a Zeus ballistic missile interceptor in 1966.²⁹

But even the conservative CIA prediction showed a potentially immense growth, as shown by the graphical comparison of different scenarios in figure 4. These reports were considerably overestimated, as the U.S. would find out through satellite reconnaissance in 1961.³⁰ The reality was that by 1960 the Soviet Union had acquired four ICBM nuclear warheads, while the U.S. had 12 nuclear warheads in its arsenal, not hundreds as the predictions

²⁹U.S. Army. *Nike Zeus Rocket- Test firing of a Nike Zeus missile, 1965*, Accessed August 8, 2021.

³⁰Dwayne Day. 'Of myths and missiles: the truth about John F. Kennedy and the Missile Gap', (2006).

showed.^{31, 32} No matter how deeply rooted in overestimation, the truth of a profound U.S. vulnerability reached the public discussion.³³

The impact of the Missile Gap went so far that NATO governments questioned the deterring effect of the U.S. nuclear program.³⁴ This debate shows the immense pressure under which missile defense systems were being developed at that time. The prevalent targeting concept at the time was nuclear deterrence by punishment or what was known as counter value targeting. This Western approach of assured destruction, which in the face of immense nuclear arsenals was described by Donald Brennan as Mutual Assured Destruction, which he abbreviated as MAD for his dislike of the concept.³⁵

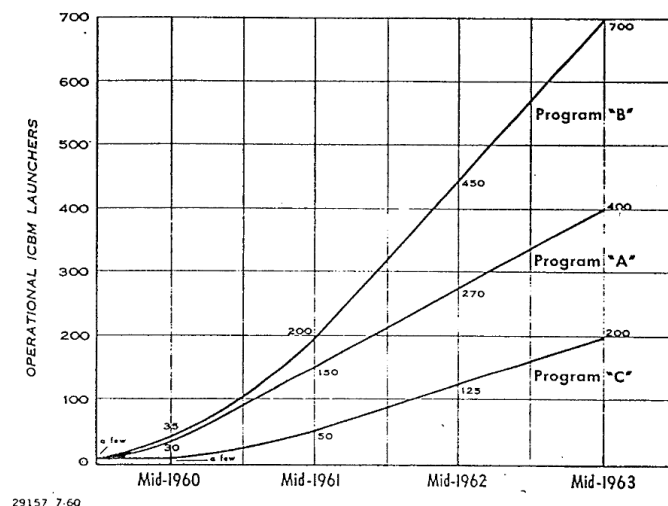


Figure 4. CIA's Prediction on Soviet Nuclear Weapons – shows graphic predictions based on different scenarios of Soviet nuclear developments – shows the potential growth of the Soviet strategic nuclear arsenal in four different scenarios.³⁶

The concept of defensive measures argued that a defender needed to prepare for the

³¹Norris, Robert and Cochran Thomas, *Nuclear Weapons Data Book* (Washington DC: Natural Resources Defense Council, Inc. January 1997) 18.

³²Norris and Cochran, *Nuclear Weapons Data Book*, 17.

³³Greg Thielmann. 'The Missile Gap Myth and Its Progeny', (2011).

³⁴Gregory Pedlow, *NATO Strategy Documents, 1949-1969* (NATO October 1997), 21.

³⁵Peter Grier, 'In the Shadow of MAD', *Air Force Magazine* (2001).

³⁶CIA. *Soviet Capabilities For Long Range Attack Through MiD-1965*, (1960), 3.

challenges of an all-out nuclear exchange. The preparation for such a scenario required immense budgets to install systems that would defend the entire territory or at least major cities of a nation. This scenario also required the defense system to work against focused attacks. However, there was not much enthusiasm or funding by the U.S. side to create a complete Urban Defense System, again due to budget considerations and the potential risk of destabilizing, according to some voices, existing Soviet-American strategic equilibrium.³⁷

In the early phase, from 1959 and 1960, there was little conviction that the system would work due to technical challenges.³⁸ A significant challenge was keeping the interceptor on target as the adversarial missile could use different techniques to get the interceptor off the path. Saturation was another anticipated problem. Production of the system was delayed by concerns over the functionality, feasibility, and concerns for an overall anti-ballistic concept that would need more components than just the interception system. U.S. Secretary of Defense McNamara argued that a missile defense system only made sense if it was complemented by other damage mitigation and protection measures such as fallout shelters.³⁹ He proceeded to strive for technological development but tried to forestall the introduction of heavy anti-ballistic missile systems to stop the action-reaction-cycle he believed would fuel a U.S.-Soviet arms race.⁴⁰

NATO meanwhile implemented in 1961 a system that would later become a pillar of its *Integrated Air and Missile Defence* approach, the *Integrated Air Defence System*. The first step was the integration of radar stations, national radar networks and surface to air missile batteries into command-and-control systems.⁴¹ This integration enhanced NATO's early warning

³⁷Yanarella, *The Missile Defense Controversy*, 84.

³⁸Yanarella, *The Missile Defense Controversy*, 60.

³⁹Yanarella, *The Missile Defense Controversy*, 80.

⁴⁰Yanarella, *The Missile Defense Controversy*, 55.

⁴¹NATO. 'NATO Integrated Air and Missile Defence', (2021).

capability by increasing data-speed and availability.

In July 1962, McNamara held his widely discussed Ann Arbor speech, proposing a counterforce approach, and abolishing the counter-value approach, acknowledging the idea that mutually assured destruction as a way to keep the peace is dangerous.⁴² However, in the aftermath of the speech, McNamara saw much pressure in response to his speech. Opponents argued that a less than all-out war approach would make conflict escalation more likely, leading McNamara to deemphasize the no cities idea.⁴³ Mutually assured destruction continued to be the basis of U.S. policy even though Soviet Union actions suggested otherwise.

At the same time, the Soviet Union was facing significant pressure from the existing U.S. nuclear capabilities and began constructing its first anti-ballistic missile system named *Galosh* around Moscow in 1962.⁴⁴ An additional motivator was the separation of the communist bloc in two separate camps. The Sino -Soviet relationship that had become strained by ideologic and political differences since 1958, ruptured partially in 1960 after the Soviet Union withdraw its advisors.⁴⁵ The divide became even more apparent in 1962 after the Soviet Union and the U.S. came to an agreement in the Cuban Missile Crisis, as Mao viewed the de-escalation as a betrayal to the communist cause.⁴⁶ The split left the Soviet Union with a new competitor that was striving for nuclear capabilities at its boarder. The *Galosh* missiles carried nuclear warheads as a means of intercepting and were fired from silo structures. The missile in transport is shown in figure 5. The picture gives an impression of the size of the defense systems at the time. Such systems were neither easily built nor easily adapted to developing missile technologies if an adversary

⁴²Robert McNamara. 'Commencement address July 9, 1962', Accessed July 18, 2021.

⁴³Yanarella, *Missile Defense Controversy*, 51.

⁴⁴UCS. 'History of Russia's Anti-ballistic Missile (ABM) System', (2002).

⁴⁵Raymond L. Garthoff, 'Sino-Soviet Military Relations', *The Annals of the American Academy of Political and Social Science* Vol. 349 (September 1963), 88-91.

⁴⁶*Ibid.*

overcame the defense by developing a faster or more evasive attacking missile.

From October 13th to October 26th, the Cuba Missile Crisis 1962 dominated the news cycle. The Soviet Union had begun stationing nuclear weapons in Cuba, putting all major cities of the continental United States and 90 million people within their range.⁴⁷ Only serious negotiations and a sea quarantine helped ease the situation after President Kennedy had discarded airstrikes as an option due to no existing guarantee to hit all Soviet missile sites.⁴⁸

Talks about limitations on any aspect of the nuclear arms race were ongoing since the creation of the United Nations in 1949 but had not come to any significant results. In April 1963, the Soviet Union indicated the desire to establish a "hot line" of communication with the U.S. government, which lead to an agreement in June to start talks about limitations on nuclear tests.⁴⁹ The negotiation participants reached an agreement on a ban of nuclear tests in outer space, the atmosphere, and underwater, but disagreement about underground tests persisted as this would have required on-site inspections.⁵⁰ This limited agreement shows that all sides were aware that unlimited use of nuclear weapons would be in neither's interest and the will to cooperate as long as vital interests are not touched.

The U.S. abandoned in 1964 the *Nike Zeus* program for being relatively ineffective compared to its immense cost and being vulnerable to surface blasts. Instead, the U.S. introduced a new program named *Nike-X*, based on *Nike Zeus*, including advanced missile defense with effectors of different ranges and fallout shelters. It was designed to use the *Zeus* missiles variant Spartan, for long-range intercepts and newly developed Sprint missiles for shorter-range

⁴⁷ Robert McNamara. 'Forty Years After 13 Days', (2002).

⁴⁸ McNamara, 'Forty Years After 13 Days'.

⁴⁹ Bernhard Bechhoefer, 'The Nuclear Test Ban Treaty in Retrospect', *Case Western Reserve Journal of International Law* Vol. 5 Issue 2 (1973), 126.

⁵⁰ Bechhoefer, 'Nuclear Test Ban Treaty in Retrospect', 127.

intercepts. However, *Nike-X* also had difficulties receiving funding beyond the stage of development.⁵¹



Figure 5. Galosh Anti-Ballistic Missile System – shows the Soviet interceptor missile in transport⁵²

Both missiles are shown on their launchers in figures 6. In 1964, the Soviet Union paraded its *Galosh* missile defense system, even though it would not be completely operational until 1967. The Soviet development put more pressure on the U.S. side as *Nike-X* was the only missile defense system of the West. McNamara continued to argue that due to the potential costs of deployment, the concept needed proof so that until 1966 no progress towards deployment was reached.⁵³

In 1967 the U.S. government decided on a so-called “light deployment” on a smaller scale than previously planned. The light deployment would be prudent because it had four

⁵¹Yanarella, *Missile Defense Controversy*, 99.

⁵²U.S. National Archives. *A right front view of a vehicle-mounted Soviet Galosh anti-ballistic missile launcher*, Accessed July 26, 2021.

⁵³Yanarella, *Missile Defense Controversy*, 102 and 119.

advantages. According to McNamara, it would be relatively inexpensive, discourage nuclear proliferation, add a further defense to strategic silo sites, and add defense for the U.S. population.⁵⁴

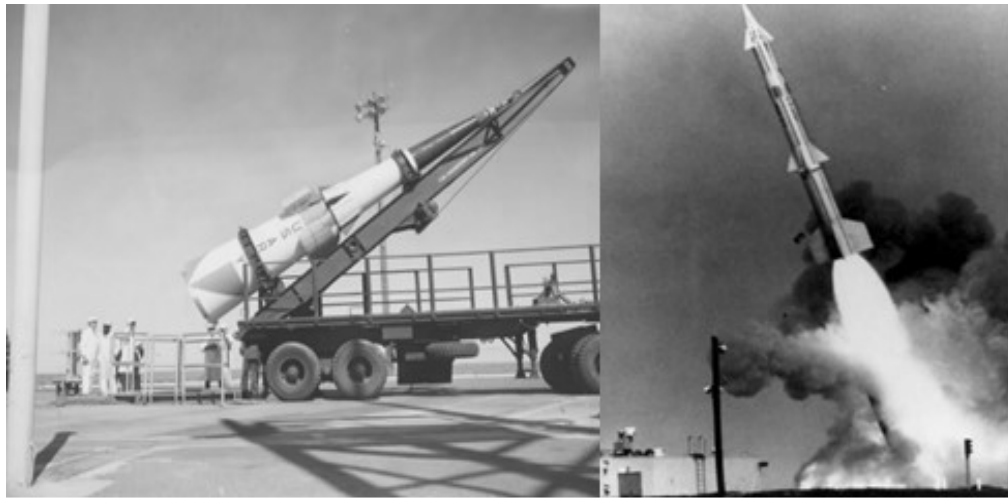


Figure 6. Sprint and Spartan - shows a Sprint missile⁵⁵ (left) and a Spartan long range interceptor, picture to be connected to Sprint, Source United States Army⁵⁶

However, McNamara also stated that the main deterrence pillar is the assured destruction capability as the deployment of missile defense at this time would trigger the Soviet Union to increase its offensive capability without contributing much to the defense of the U.S.⁵⁷

The first Chinese nuclear missile program in the 1960s posed an additional threat but was not comparable to that of the Soviet Union. McNamara argued that limited deployment of missile defense in the so-called Sentinel program would provide limited defense of the entire U.S. against the Chinese threat and protect U.S. strategic assets against Soviet Union

⁵⁴Yanarella, *Missile Defense Controversy*, 121 – 122.

⁵⁵Ryan Cieri. *SC-639182 - SPRINT at LC50 WSMR, 1 March 67*, Accessed July 1, 2021.

⁵⁶U.S. Army. *Picture Spartan Missile*, Accessed August 29, 2021.

⁵⁷Robert McNamara: *Statement of Secretary of Defense, Robert S. McNamara Before the House Armed Services Committee on the Fiscal Year 1968-72 Defense Program and 1968 Defense Budget* (1968), 58.

attacks.⁵⁸ It is important to note that cost-effectiveness considerations seem to outweigh considerations of potential destabilizing results.

For *Nike-X*, it was necessary to have a similar amount of interceptor missiles as the adversary had ballistic missiles. Interceptors were more cost-intensive than offensive missiles, and decoy missiles could fool them. To achieve a level of defense that could realistically offset the Soviet Union's nuclear capabilities was close to impossible. For both sides, internal political discussions were a significant influence factor in their missile defense considerations. The distribution of the U.S. missile defense sites of *Nike Zeus* is shown in figure 7, showing the idea of a population-centric approach that also protected strategic launch sites.

From 1961 to 1967, the count of Soviet Union ICBM nuclear warheads rose from four to 818 and from two launcher platforms to 818.⁵⁹ The number of U.S. ICBM nuclear warheads rose in the same period from 12 warheads and launcher platforms to 1054 launcher platforms and 1044 warheads.⁶⁰ The number of submarine-launched ballistic missiles (SLBM) rose in the same period in the U.S. from 32 missiles and launching systems to 1552 launchers and 656 missiles.⁶¹ For the Soviet Union, the number of launchers increased from 30 to 87 and for missiles from 30 to 72.⁶²

The U.S. had kept a strategic advantage over the Soviet Union while the Soviet Union had invested heavily into the acquisition of sub-strategic nuclear weapons while continuing to invest in the development of strategic weapons.

In 1968, NATO revised its strategic concept, publishing MC14/3 again, moving away

⁵⁸U.S. Department of State Office of the Historian: *160. Draft Memorandum From Secretary of Defense McNamara to President Johnson*, (Washington DC: 1966).

⁵⁹Norris and Cochran, *Nuclear Weapons Data Book*, 18.

⁶⁰Norris and Cochran, *Nuclear Weapons Data Book*, 17.

⁶¹Norris and Cochran, *Nuclear Weapons Data Book*, 17.

⁶²Norris and Cochran, *Nuclear Weapons Data Book*, 17.

from the idea of massive retaliation towards a “flexible response” concept.⁶³ The change was based on the idea that conflict escalation could potentially be controlled. More importantly it was necessary to back the deterrence concept with credibility.

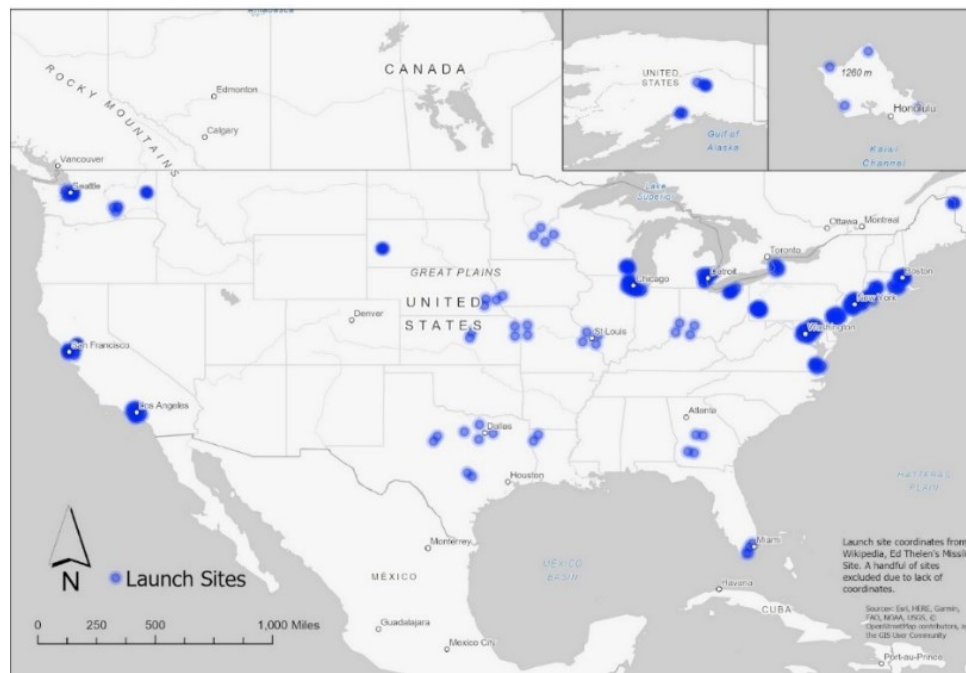


Figure 7. Distribution of *Nike* Sites – shows the location of assets connected to the *Nike* project in the United States.⁶⁴

Assured destruction in reaction to a limited Soviet strike could have been perceived as disproportionate and thus as unlikely to be executed. It was thus necessary to have the tools and plans ready to counter adversarial actions of different kinds and scales or to escalate to contain a limited conflict deliberately. The strategy contained no reference to missile defense, given that Western missile defense was still under development and only limitedly deployed in the U.S.

⁶³NATO Military Committee: *Final Decision on MC 14/3 A Report by the Military Committee to the Defence Planning Committee on Overall Strategic Concept for the Defence of the North Atlantic Treaty Organization Area* (1968), 365.

⁶⁴Alex Hempel. *The Missile Next Door: A Spatial History of Nike Ajax and Hercules*, Accessed July 23, 2020.

The Soviet-Western relationship in this phase was dominated by crisis and distrust. Still, in 1965 negotiations on the treaty on the non-proliferation of nuclear weapons had begun in the wake that a potentially uncontrolled spread of nuclear weapons would not benefit recognized nuclear nations. An arms race took place for superiority in nuclear missile capabilities, as the U.S. and Soviet Union's arsenals grew significantly triggered by mutual interdependence.⁶⁵ However, the U.S. nuclear arsenal peaked in 1965 and decreased afterward while the Russian arsenal increased until 1988. Missile defense efforts were a product of this relationship and less a factor influencing it. However, the possibility of future technological breakthroughs that could lead to the superiority in the existing arms race by mitigating adversarial offensive capabilities pushed development efforts. Mainly cost-effectiveness considerations lead to limited and, for the U.S., late production and deployment of missile defense. The Soviet Union focused on protecting its strategic command-and-control infrastructure in its capital, Moscow. The *Galosh* defense system and its distribution around Moscow are shown in figure 8.

Both sides limited their missile defense efforts in favor of investing in offensive capabilities because of the immense cost large-scale missile defense would have imposed. In this framework, the technological and psychological impact on international relations was limited. Missile defense seems to have functioned as a token for negotiations as both sides knew that large scale deployment on their side would be unlikely.

The U.S. proposed a limitation on missile defense in 1967, but the proposal was rejected by Soviet leadership.⁶⁶ A counter-proposal was made that any limitation talks needed to include offensive capabilities alongside anti-ballistic missile systems. The U.S. – Soviet talks on limiting

⁶⁵Martin McGuire, 'A Quantitative Study of the Strategic Arms Race in the Missile Age', *The Review of Economics and Statistics* Vol. 59 No. 3 (August 1977), 339.

⁶⁶Nuclear Threat Initiative. 'Treaty on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty)', (2011).

missile defense were welcomed by the United Kingdom, as it saw missile defense as a potential factor that could lead to a significant increase in nuclear arms acquisition of the superpowers.⁶⁷

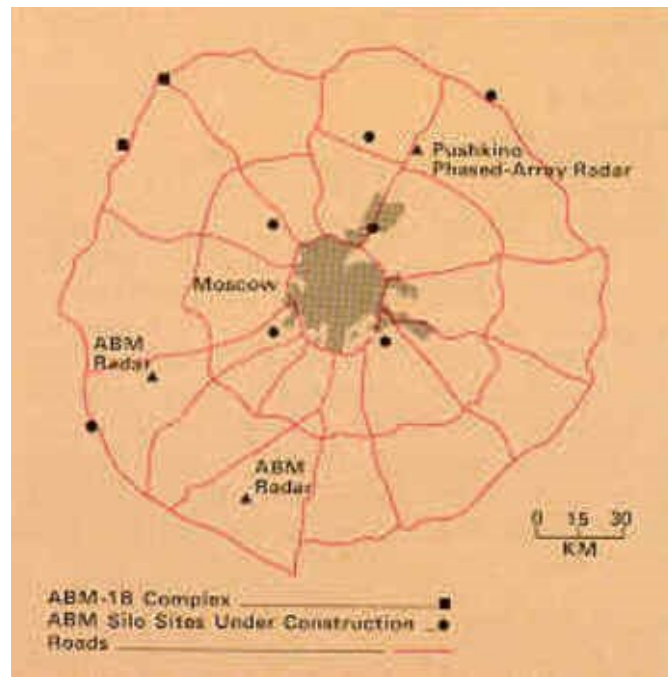


Figure 8. Galosh Defense System – shows the distribution of missile defense sites around Moscow.⁶⁸

This view was driven by the fact that Great Britain's nuclear program was very limited in terms of nuclear warheads, which would have made it vulnerable to missile defense thus reducing its deterrence capability.

1969 Safeguard

In the 1968 election in the U.S., President Richard Nixon was voted into office. The

⁶⁷UK Parliament. 'Offensive And Defensive Missiles (Talks)', Accessed March 10, 2022.

⁶⁸U.S. Department of Defense, *Chapter III Strategic Defense and Space Programs*, in *Soviet Military Power* (Washington DC: U.S. Government Printing Office 1987).

counter-proposal the Soviet Union had made in 1967 was signed, and missile defense negotiation, combined with talks about strategic arms were accepted.⁶⁹ Talks began at the end of 1969 in the form of the Strategic Arms Limitation Talks I (SALT I). After difficult negotiations, both parties signed the Interim Agreement on specific measures limiting strategic offensive arms and the ABM Treaty on the limitation of strategic defensive systems.⁷⁰ The ABM treaty limited the signatories to two missile defense sites and defined limits on deployment details, such as a limit of 100 launchers for interceptor missiles. The ABM treaty limited the signatories to two missile defense sites and defined limits on deployment details, such as a limit of 100 launchers for interceptor missiles. This reduced the risk of an escalating arms race in missile defense and limited potential developments in the already operational Soviet missile defense system. But the treaty allowed in article XV the signatories to withdraw from it with a six-month notice if events related to the subject of the treaty could jeopardize their supreme interests. Such circumstances are no extremely hard to imagine if necessary. The acquisition of ballistic missiles by any adversarial regime could have served as pretense to withdraw if necessary. Additionally directed energy weapons for example were not covered by the treaty.⁷¹ While the treaty limited certain types of missile defense tests, technological breakout as well as withdrawal were potential developments that the signatories needed to consider. While deployment and testing was severely limited by the treaty the threat of future large scale deployment of missile defense was not banned.

On July 1, 1968, the treaty on the non-proliferation of nuclear weapons was signed by 62 nations, including the U.S. and the Soviet Union. The signatories agreed to abstain from assisting

⁶⁹Nuclear Threat Initiative. ABM Treaty.

⁷⁰Nuclear Threat Initiative. ABM Treaty.

⁷¹Mark A. Clark, 'Directed Energy Weapons on the High Frontier', *Denver Journal of International Law & Policy* Vol. 13 No. 1 (January 1983).

other nations to acquire nuclear weapons. They further agreed to negotiate on the end of the nuclear arms race to the reduction in nuclear weapons. The treaty is of importance as it is legally binding and aims at the reduction of nuclear weapons towards nuclear disarmament even though it binds the participants only to negotiations on the latter topics. Even though the Anti-Balistic-Missile treaty was just proposed by the U.S., the U.S. and Soviet Union committed to a treaty with the aim of negotiations on nuclear disarmament. Admittedly a long-term goal, not achieved even today. Yet, the assumed potential of missile defense seemed to have not been considered a threat to reduced nuclear arsenals. At least the benefits of arms reduction and non-proliferation seemed to have outweighed the potential impact of missile defense. A potential destabilization by missile defense was not indicated by the developments around the non-proliferation treaty.

In 1967, public opinion on the topic of missile defense had begun to change. Especially in the cities close to Sentinel sites, protest groups formed arguing that the proximity of missile defense systems made them a target.⁷² The new U.S. government took up these concerns and abolished the Sentinel program to focus on “Safeguard,” a lighter defense system that would not require sites close to major cities.⁷³ The location of these Safeguard missile defense sites is shown in figure 9 underlining the reduction and redistribution of launcher sites compared to the Sentinel sites in figure 7.

The shift from Sentinel to Safeguard found positive reactions in the United Kingdom again which continued with its view of missile defense triggering nuclear arms acquisition.⁷⁴ NATO members in general viewed Safeguard more positive than they had Sentinel mainly due to a shift in context from growing tension and a Chinese focus to arms control talks between the

⁷²Yanarella, *Missile Defense Controversy*, 146 - 147.

⁷³Yanarella, *Missile Defense Controversy*, 145.

⁷⁴Jeremy Stocker, *Britain's Role in U.S. Missile Defense* (Online: U.S. Army Warcollege Press 2004), 4.

U.S and the Soviet Union and President Nixon's reaffirmation of the Euro-Atlantic partnership.⁷⁵

The development of Multiple Independent Reentry Vehicles (MIRVs) worsened the defender's situation as saturation became easier and interception harder. The U.S. developed MIRVs in 1970, and the Soviet Union followed suit in 1975.⁷⁶

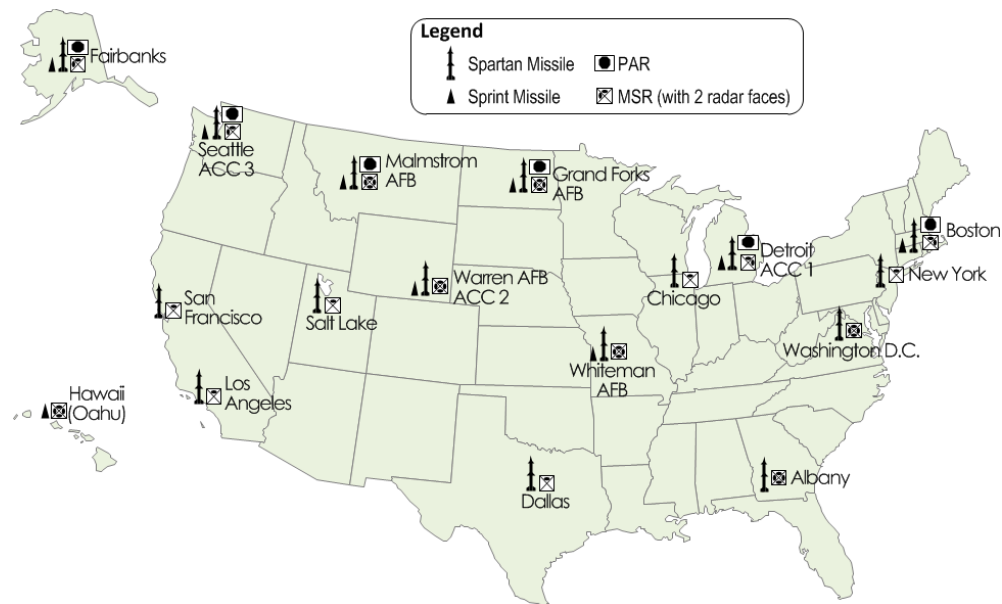


Figure 9. Safeguard Missile Defense Locations- shows the distribution of the Safeguard approach to U.S. missile defense which protected mainly strategic U.S. nuclear assets.⁷⁷

The development of MIRVs diminished the optimism that ballistic missile defense could be successful.⁷⁸ MIRVs enhance an attack by distributing the different independent reentry vehicles each heading towards a different target. The defender needs to either intercept early, increasing the technological requirements, or to intercept more targets later requiring more defense systems and interceptor missiles.

⁷⁵Anthony Gardner, 'The Alliance And Missile Defense', *Armed Forces & Society* Vol. 16 No. 2 (Winter 1990) 216.

⁷⁶Milton Leitenberg. *The Origin of MIRVs*, Accessed July 01, 2021, 1.

⁷⁷Nuclearabms.info. *Sentinel*, Last modified January 28, 2012.

⁷⁸Andrei Kokoshin. *Reflections on the Cuban Missile Crisis in the Context of Strategic Stability – Working Draft*, (2012), 7.

During the 1970s, the Soviet Union undertook efforts to update its Galosh missile defense system, but it did not gain any significant advantage. The update reduced the gap that had evolved through missile development only to a minor degree.⁷⁹ In 1971, the A-35 anti-ballistic missile system was deployed as an upgrade to the earlier Galosh system. There was still no complete and efficient missile defense system that could defeat an all-out nuclear attack.

U.S. President Nixon sought a path leading away from assured destruction towards more options in case deterrence failed. He directed the Secretary of Defense to compile a study on potential targets with importance recovery of the adversary and capabilities for offensive action but excluding population per se.⁸⁰ The Office of the Secretary of Defense created a policy guideline to establish conflict boundaries that would signal to the enemy an intention of conflict limitation with options ranging from destruction of targets critical for post-war recovery to the neutralization of conventional enemy forces.⁸¹ This approach was a fundamental change in thinking. The assured destruction concept did not include the possibility of de-escalation or conflict limitation for nuclear conflicts. The new policy was set to establish a toolbox of options for the President. The strategy focused not only on Russia but also on the People's Republic of China. The documents also show the U.S. thinking that a nuclear escalation could potentially be limited in intensity and some measure of victory achieved.

Both parties to the ABM treaty signed an amendment limiting the missile defense sites from two to one, in 1974.⁸² The Soviet Union continued to focus its system on Moscow. However, it repeatedly violated the ABM treaty by testing surface-to-air missiles in anti-ballistic

⁷⁹Caspar Weinberger and George Schulz. 'Soviet Strategic Defense Programs 1985', Accessed June 4, 2021.

⁸⁰Office of the U.S. Secretary of Defense: *Memorandum for Distribution Subject NSDM 242 Targeting Study* (1975), 3.

⁸¹Office of the Secretary of Defense: *Memorandum for General Scowcroft Subject Nuclear Weapons Employment Policy* (1974) 2 -5.

⁸²Alicia Godsberg. 'Anti Ballistic Missile Treaty', (2008).

mode and installing radar systems beyond the limitations established by the treaty.⁸³ Even though the Soviet Union still maintained its missile defense lead and potentially could have extended this lead, it kept its violations to a level where an arms race seemed unlikely.⁸⁴ The Soviet Union tried to limit potential U.S. missile defense to the extent of the treaty while sticking to its preferred strategy of damage limiting preemptive strikes.⁸⁵ The U.S. decided in 1976 to abolish its remaining missile defense site in North Dakota, making the Galosh system the only existing and operational missile defense system at the time.⁸⁶ The low cost effectiveness and easy penetrability made a missile defense system facing thousands of ICBMs unfeasible in the U.S. view. Even though the Soviet Union continued to have a missile defense system, the absence of U.S. missile defense did not seem to cause any recognizable disturbance in the relationship. Up until the end of U.S. missile defense, the U.S. and Soviet systems were no threat to offensive nuclear arsenals.

In June 1977, a Washington Post article noted that the intended defense department budget contained various nuclear weapon programs, such as the Enhanced Radiation Weapon or Neutron Weapon.⁸⁷ The weapon was supposed to have benefits over traditional nuclear weapons as it would have less blast and heat effects. The key advantage was to create less collateral damage while being still deadly using temporary (secondary) radiation. The budget also included several tactical nuclear weapons. The article sparked protests across the Atlantic because public opinion expected a winding down of the Cold War.⁸⁸ The Strategic Arms Limitation Talks II (SALT II), which had started in 1974 with major breakthroughs, were going slow as

⁸³Weinberger and Schulz. 'Soviet Strategic Defense Programs 1985'.

⁸⁴Kevin Powell Seavey, *Soviet concepts of ballistic missile defense*, (1988), 84.

⁸⁵Seavey, *Soviet Concepts*, 85.

⁸⁶John Finney, 'Safeguard ABM System to Shut down', *New York Times*, November 25, 1975.

⁸⁷Walter Pincus, 'Neutron Killer Warhead Buried in ERDA Budget', *Washington Post*, June 6, 1977.

⁸⁸Ruud van Dijk, *Prelude to the Euromissile Crisis The Neutron Bomb Affair, the Netherlands, and the "Defeat of the Strangeloves," 1977–1978*, (2015), 4.

disagreements over details on cruise missiles and Soviet bombers were blocking results in 1975.⁸⁹ High-level meetings in 1978 and 1979 reached a breakthrough for SALT II, but President Carter requested the U.S. Senate delay ratification in the face of the Russian invasion of Afghanistan.⁹⁰ The U.S. offered not to retreat from the treaty as it was legally binding until a party declared its intention not to become a signatory.

The Soviet Union continued to develop its intermediate-range nuclear forces putting the European theater in a more threatening position. Conflict flared up as the Soviet Union tried to replace aging SS-4 and SS-5 missiles with the modern SS-20 system hoping to keep a strategic advantage over the European theater.⁹¹ But public opinion in the West was not in favor of further nuclear arming. European societies were less and less inclined to see their home countries as nuclear battlefields and increasingly strong peace movements developed during this time.⁹² In December 1979, the North Atlantic Council decided on two significant actions.⁹³ The first decision was to station intermediate-range nuclear cruise and ballistic missiles (Pershing II and BGM 109 Tomahawk) in Europe. The second decision was to push towards negotiations with the Soviet Union on limiting intermediate-range nuclear forces in Europe. This decision became famous as the NATO “double-track decision.” It sparked protests in some NATO member states, fueled by peace movements, which lead to the fall of the German Chancellor Helmut Schmidt in 1982. Nonetheless, the document was ratified.⁹⁴

Still, the double-track decision would prove to be the right combination of alliance commitment (the U.S. responding to European requests) and with a push towards addressing

⁸⁹U.S. Department of State: Treaty Between The United States of America and The Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms (SALT II) (1979).

⁹⁰Ibid.

⁹¹Joshua Woodyat, *War Scares and (Nearly) the End of the World: The Euromissiles Crisis of 1977–1987*, (2020).

⁹²BPB. ‘Vor 35 Jahren: Bundestag bestätigt Entscheidung zum NATO-Doppelbeschluss’, (2018).

⁹³Joseph Luns: *Special Meeting of Foreign and Defence Ministers Brussels* (Brussels: 2000).

⁹⁴Herber, Benedikt, ‘Die Kernspaltung der Gesellschaft’, *Der Spiegel*, December 12, 2019.

such issues via arms control.⁹⁵ Negotiations on the intermediate-range nuclear forces took place but did not progress significantly during the following years.⁹⁶

In 1982 the administration of U.S. President Ronald Reagan accused the Soviet Union of non-compliance with the SALT documents in general. Still, it stated the U.S. would comply to the extent that the Soviet Union would too, and SALT limitations were kept in place.

Between 1969 and 1982, fundamental arms control treaties were signed, and the foundation for arms limitation and arms control was laid. The U.S. and the Soviet Union had also started negotiations about further treaties, such as the Strategic Arms Reduction Treaty (START). The number of U.S. ICBM nuclear warheads rose to 2,139 while the launcher count stayed relatively constant at 1,049.⁹⁷ The Soviet Union increased its ICBM arsenal to 6282 (including MIRVs) and the launchers to 1,398.⁹⁸ The arms competition was still ongoing. Even though the stationing of SS-20 in Europe heated up the conflict, the intensity of crisis regarding the European theater stayed significantly lower than in the period of the Cuban or the Berlin Crisis. The technological impact of missile defense stayed relatively insignificant. None of the systems deployed or developed had the effectiveness or scale to mitigate a nuclear attack of major scale. However, the psychological impact of potential future developments was enough for the Soviet Union to insist on combining arms control talks for offensive weapons with defensive systems.

1983 Strategic Defense Initiative Reagan

In 1983 U.S. President Reagan painted a dark picture of the growth in the capabilities of

⁹⁵Giovanni Brauzzi. *40 Years after the NATO Double Track Decision*, (2019).

⁹⁶Daryl Kimball. 'The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance', (2019).

⁹⁷Norris and Cochran, *Nuclear Weapons Data Book*, 13.

⁹⁸Norris and Cochran, *Nuclear Weapons Data Book*, 15.

Soviet military forces in his address to the nation.⁹⁹ He stated the Soviet Union was acquiring superior forces while supporting hostile third parties with missile technology and deducted the need to strengthen U.S. armament efforts. The speech identified the need for growth and improvements in weapon systems as the Soviet Union had surpassed U.S. arsenals in conventional forces and other categories like submarine ballistic missiles and intermediate-range nuclear land forces. Further, he stated that NATO had, in 1979, decided to deploy intermediate forces, but had not deployed any carrying nuclear warheads even though the Soviet Union did so. The speech also laid the first brick for the Intermediate Nuclear Force treaty by stating that NATO would refrain from such forces if the Soviet Union followed suit, referencing NATO's double-track decisions. A smaller part of the speech focused on missile defense. The first step was to be a significant research program in accordance with the ABM treaty that would push towards effective missile defense for the U.S and its allies. President Reagan stated that if the Soviet Union would join in arms reduction, then stability would have been achieved, indicating that the significant arsenals of the Soviet Union threatened the carefully established equilibrium of the last years. The Strategic Defense Initiative (SDI) researched various possibilities for missile defense ranging from space-based radiation weapons to satellites designed to hit a missile during its exo-atmospheric travel phase. The U.S. invited its NATO allies to join the research program, but interest was slow to develop, and outright skepticism became public.¹⁰⁰ Canada for example refused to join the research phase, fearing among other factors to limit its diplomatic options when it later came to a deployment phase.¹⁰¹ Other allies joined the program and finally even France dropped its opposition against French companies taking part, but reservations in

⁹⁹Ronald Reagan, *Address to the Nation Washington, D.C. March 23, 1983*, (2021).

¹⁰⁰New York Times, 'Canada Declines To Join U.S. Space-Arms Effort', *New York Times*, September 8, 1985.

¹⁰¹Michael Clugston, 'A polite 'no' to star wars', *Maclean's* (September 16, 1985).

regard to feasibility and effectiveness even to potential impacts on established deterrence concepts were kept.¹⁰² The notion to start a program that the Soviet Union strongly opposed during this phase of the Cold War was also an influence factor that stirred doubts about the program. In terms of alliance stability SDI did little to support a united front within NATO. But more importantly the reactions indicate a perception of strategic missile defense as something that could negatively influence the East – West relationship. This perception likely was caused by the Soviet objections but also by the imagination of where technological breakthroughs could lead in terms of impact on a long-established deterrence equilibrium.

After heated debates on the topic of SDI in 1987, the Soviet Union dropped the objections against it in favor to signing the Intermediate-Range Nuclear Forces (INF) Treaty.¹⁰³ The Soviet Union had made SDI repeatedly the topic of negotiations but in the end its focus laid less on SDI and more on the threat of Pershing II missiles in Europe.¹⁰⁴ The fruits of NATO's double-track decision were reaped, but missile defense continued to be a topic for discussion. As a bilateral agreement between the U.S. and the Soviet Union, the INF treaty specified the destruction of all land/ground-based missiles and launcher systems with a range between 500km and 5,500km in Europe for the signatories. Most allied forces with this range, such as French and British forces, were not covered by the treaty.

However, German forces possessed Pershing missiles. The Soviet Union demanded them to be included in the treaty, which led the German chancellor to intervene to dismantle the missiles, a unilateral act that did not become part of the treaty.¹⁰⁵

¹⁰²Judith Miller, 'Western Europeans, Some With Doubts, Support 'Star Wars'', *New York Times*, December 30, 1985.

¹⁰³Pavel Podvig, 'Did Star Wars Help End the Cold War? Soviet Response to the SDI Program', *Science & Global Security* Vol. 25 No. 1 (2017) 4.

¹⁰⁴David E. Hoffmann. 'Mutually Assured Misperception on SDI', (2010).

¹⁰⁵Federation of American Scientists. 'Intermediate-Range Nuclear Forces [INF] Chronology', Accessed 2021.

SDI, in this context, which the Soviet Union had objected since its announcement, was perceived as a much lesser threat than a build-up of NATO intermediate range nuclear forces in Europe. Even though the ABM treaty limited a deployment, a potential technological breakthrough could have led to a U.S. withdrawal in accordance with the treaty. This indicates that SDI while being objected was apparently not perceived as an immediate threat to Soviet strategic capabilities, thus the objections were dropped in favor of a focus on nuclear capabilities.

In 1986, the Reagan administration ended its voluntary restraint based on the SALT II treaty and stated it would decide over its force posture based on the Soviet threat as the Soviet Union had repeatedly violated the SALT documents.¹⁰⁶ The Soviet Union halted the operation of the debated Krasnoyarsk Radar in 1987 and instead added various radars and infrared-based launch detection satellites but still violated the treaty by not placing all installations at its perimeter.¹⁰⁷ The potential end to U.S. arms limitations led to a more restrained Soviet behavior without completely ending treaty violations. The U.S. and the Soviet Union ratified the Threshold Test Ban Treaty in 1990. This was possible after the setup of the joint verification experiment in 1988, a program to test the concept of joint on-site measures of nuclear yield after a test. The lasting debate on verification for the treaty was solved and nuclear tests of more than 150 kilotons were prohibited.¹⁰⁸ The success of the joint verification experiment and agreement on the Threshold Test Ban Treaty shows a baseline willingness to cooperate in the face of a still tense Cold War in 1988.

The number of Soviet nuclear warheads had changed in the period from 1982 to 1990 from 6,282 to 6,938 ICBM warheads and to 1,378 for the launcher systems.¹⁰⁹ The number of

¹⁰⁶U.S. Department of State: *SALT II* (1979).

¹⁰⁷Edward Warner III, *The Defense Policy of the Soviet Union* (Santa Monica: Rand August 1989) 85.

¹⁰⁸Sig Hecker. 'The Joint Verification Experiment', Accessed July 16, 2021.

¹⁰⁹Norris and Cochran, *Nuclear Weapons Data Book*, 18 and 25.

U.S. strategic launcher systems had decreased from 1,039 to 1,000 system and increased for ICBM warheads from 2,139 to 2,440.¹¹⁰ The number of U.S SLBM launchers increased from 520 to 608 and SLBM warheads from 4768 to 5216.¹¹¹ The Soviet Union's numbers for SLBM launchers changed from 990 to 908, warheads changed from 1,866 to 2,900.¹¹² The focus of Soviet Union forces in this period was on land-based forces, which indicates that U.S. missile defense was not a predominant consideration as SLBMs are potentially harder to intercept. While missile defense was limited through the ABM treaty, SDI could have meant a potential technological breakthrough for the U.S. outpacing Russian capabilities. But the prospect seemed either unlikely or not threatening enough for the Soviet Union or Russia to restructure its strategic forces towards this threat. The limited changes in strategic nuclear arsenals in this period indicate a stable balance between the conflicting parties.

The debate about SDI's impact is still not settled but appears to have been limited.¹¹³ There are views that SDI may have defeated the Soviet Union by uncovering that it would not have a chance to compete in yet another technological field such as space-based missile defense.¹¹⁴ However, other voices see the impact much more limited. Still, the Soviet Union made the program a key point for the U.N. Summits in Geneva 1985 and Reykjavik 1986, indicating certain importance at least as negotiation object.¹¹⁵ But the primary drivers for the end of the Soviet Union were the decline of its economy and rising domestic political pressure. The Soviet economic growth had slowed significantly from the mid-seventies due to the challenges

¹¹⁰Norris and Cochran, *Nuclear Weapons Data Book*, 18 and 25.

¹¹¹Norris and Cochran, *Nuclear Weapons Data Book*, 33.

¹¹²Norris and Cochran, *Nuclear Weapons Data Book*, 37.

¹¹³Podvig, 'Did Star Wars Help End the Cold War?', 4.

¹¹⁴Grover Norquist. 'Gorby didn't fall, he was pushed', (2009).

¹¹⁵Podvig, 'Did Star Wars Help End the Cold War?', 4.

of central planning and partly due to the toll that increased arms acquisitions took.¹¹⁶

The GDP of the Soviet Union in 1989 was about half of the U.S. GDP (2,734 vs. 5,642).¹¹⁷ This economic comparison indicates that any kind of strategic arms competition would have been very difficult for the Soviet Union, whether it be in offensive or defensive strategic technologies. However, it is prudent to assume that the significant research of SDI in space-related missile defense systems was seen as a threat to Soviet offensive capabilities. Signatories to the ABM were allowed to withdraw from the ABM legally by handing in a six-month notice under certain circumstances. This short period meant that a technologically advanced U.S. could have potentially pressured the Soviet Union into an arms race of a new scale. To compensate, the Soviet Union would have had to catch up on the missile defense side as well as on the offensive side.

No nation could have sustained arms acquisition and investment in offensive strategic capabilities and large-scale missile defense (two fronted strategic arms competition) while only having half the GDP of its adversary under the political conditions of the Soviet Union in 1989. Glasnost was taking a toll on the influence the Soviet Union leadership had on its subjects.

The impact missile defense had in this period appears to be more circumstantial than fundamental. While no significant developments, either in technology or in deployed systems, took place, the fear of potential progress in missile defense shaped adversarial perception. Yet, the missile defense impact was not destabilizing, given that the Soviet Union dropped objections against the SDI program in favor of signing the INF treaty.

¹¹⁶Robert C. Robert, 'The Rise and Decline of the Soviet Economy', *Canadian Journal of Economics* Vol 34, No. 4 (November 2001), 867.

¹¹⁷World Bank. 'GDP All Countries', Accessed July 17, 2021.

1991 Global Defense Against Limited Strikes

Already in the late 1980s, the world view in the East and West grew increasingly concerned about rising nuclear multipolarity in the world, acknowledging that a growing number of states are close or getting closer to step over the nuclear threshold.¹¹⁸ The world had already seen an increase in nations possessing nuclear weapons since the end of World War II. But smaller nations perceived as less stable and predictable came closer to the brink of acquiring nuclear weapons.

Post-Soviet Revival of Arms Control. In 1991, four months before the End of the Soviet Union, President Gorbachev and U.S. President Bush signed START, which had been negotiated since 1981.¹¹⁹ The treaty limited the offensive nuclear capabilities of the signatories. It specified the maximum number of launcher systems to 1,600 and nuclear warheads to 8,556 for the U.S. and 6,449 for the Soviet Union. When fully implemented, the treaty meant a reduction of strategic arms to about 20 percent.¹²⁰ The treaty was ratified in 1994 by the U.S. and Russia and by an additional protocol extended to Ukraine, Belarus, and Kazakhstan. The three nations handed over their nuclear weapons in exchange for access to global markets and development funds.

START was renamed START I in the face of an already negotiated second reduction treaty, START II followed in 1993.¹²¹ START I and II were the first treaties with specified arms reductions obligations, all older treaties had either just imposed limits (e.g. SALT) or agreed upon unspecified aims of arms reduction (e.g. Non-Proliferation treaty). The specified arms

¹¹⁸Keith B. Payne, *Missile Defense In The 21st Century* (New York: Taylor & Francis Ltd 2020).

¹¹⁹National Park Service. 'Strategic Arms Reduction Treaty of 1991', Accessed July 19, 2021.

¹²⁰Ibid.

¹²¹U.S: Department of State: Treaty Between the United States of America and the Russian Federation on Further Reduction and Limitation of Strategic Offensive Arms (START II) (1993).

reduction codified a trend that after the fall of the Soviet Union was already becoming obvious as the need of immense offensive Arsenals was gone for the U.S. and the successors of the Soviet Union could under no circumstances have sustained such arsenals due to their economic situation even if they had wanted to. Still the specified reduction also meant reduced ceilings which would be relevant in later arms acquisitions. These lower ceilings were still enormously high in relation to the capabilities of missile defense. START II specified the destruction of all land-based intercontinental missiles carrying MIRVs and a further limitation on strategic systems setting a maximum on strategic nuclear warheads to 3,500 by 2002.¹²² Parts of the Russian Duma viewed the treaty as a bad deal because of its restrictions on land-based systems, which were the main pillar of Russian nuclear forces, and being less restrictive on sea-based systems, which the U.S. had the higher numbers.¹²³ In 2002 the U.S. had 450 SLBM launchers and 3292 nuclear warheads while Russia had 232 SLBM launchers and 1,072 nuclear warheads.^{124, 125}

After the fall of the Soviet Union in 1991, the pressing reason for a strategic ballistic missile defense system was significantly reduced. The thousands of former Soviet missiles did not just go away even though Ukraine, Belarus, and Kazakhstan would trade their nuclear arsenals for the promise of territorial integrity and access to international markets. The Budapest Memorandum of 1994 for example promised Ukraine the absence of violence, economic coercion and support in case of being threatened by nuclear weapons by the signatories. The memorandum was a precondition for Ukraine to join the non-proliferation Treaty and hand over its Soviet nuclear weapons.

¹²²Alexander Pikayev, *The Rise and Fall of START II: The Russian View* (Washington DC: Carnegie Endowment for International Peace 1991) 15.

¹²³Spurgeon Keeny. 'Implications of the Duma's Approval of START II', (2000).

¹²⁴Robert Norris, 'Russian nuclear forces, 2002', *Bulletin of the Atomic Scientists* Vol. 58 No.4 (2002), 72.

¹²⁵Robert Norris, 'U.S. Nuclear Forces, 2002', *Bulletin of the Atomic Scientists* Vol. 58 No. 3 (2002), 71.

After the perceived end of history, an all-out nuclear escalation scenario seemed unlikely; thus, the guiding premises of missile defense developments had changed drastically.¹²⁶ Two scenarios replaced the threat the Soviet Union had posed. These were an accidental use of offensive ballistic missiles, in general or related to the chaotic aftermath of the Soviet Union, and the use of ballistic missiles by rogue nations against a neighbor, the U.S., or a U.S. ally.¹²⁷ This concept changed the priorities of the SDI towards the defense against limited strikes (up to 200 reentry vehicles) of undefined sources as opposed to a major attack by the Soviet Union. The adapted plan now was to use a U.S.-based theater missile defense system as a stepping stone towards a territorial missile defense system. The aim was to create a Ground-based Protection Against Limited Strikes (GPALS) and later to supplement it with space-based assets. With the addition of space-based interceptors, it would have grown from territorial defense to a global missile defense system. With the increased number of interceptors, the plan for GPALS stood from the beginning in violation of the still valid Anti-Ballistic Missile treaty.¹²⁸

NATO adapted to the changing environment as well and released the Alliance's New Strategic Concept, describing the challenges of the new security environment and including the threat of missile technology and WMD proliferation.¹²⁹ This document's missile defense aspect covers only missile proliferation, as potential adversarial actors may acquire missiles able to reach the alliance's territory, a lesson from the 1991 Gulf War. However, the topic of strategic missile defense was not mentioned. This indicates a focus of the role of these ABM systems as warfighting, theater-level assets intended to counter short and medium-range missiles and much less focus on strategic level deterrence.

¹²⁶Francis Fukuyama, 'The End of History', *The National Interest* No. 16 (Summer 1989).

¹²⁷AUSA. *Ballistic Missile Defense Background Brief* no 36, (1991), 1.

¹²⁸AUSA. *Ballistic Missile Defense Background Brief* no 36, 2.

¹²⁹NATO Heads of State and Government: *The Alliance's New Strategic Concept* (London: 1990).

The East-West Relationship - A Deterioration Step by Step. The first Russia – NATO crisis evolved around NATO's intervention into the Bosnian War in 1994, one of the wars resulting from the breakup of the Socialist Federal Republic of Serbia in 1992. Since 1992, the United Nations Protection Forces (UNPROFOR) had tried to protect civilians and secure free passage for Bosnian refugees. Caused by war crimes committed by forces of the Republica Srpska (a proto state lead by Radko Mladic), the United Nations decided for a no-flight zone over Bosnia for military aircrafts.¹³⁰ The operation began as Operation Skywatch, the surveillance of the no-flight zone, and developed into Operation Deny Flight, the military enforcement of the no-flight zone. NATO forces established the zone in support of UNPROFOR. Heavy tensions with Russia arose when NATO, in 1994, threatened to use airstrikes against forces disregarding the heavy weapons exclusion zone of 20km around Sarajevo without prior consultation with Russia.¹³¹ Russia viewed the Balkan region as its domain of influence, as large parts of the population consisted of orthodox Slavs. Russia advertised the narrative of being the protector of the Slavs and does so until today. The Russian perspective at the time was very skeptical of armed intervention and left the phase of liberal internationalism where it believed that Western and Russian interests coincided towards a more realist approach.¹³² Reconciliation with Russian was achieved to an extent, but the damage was done as it indicated to Russia that it was not seen as an equal partner. Particularly in the early 1990s, the Russian Government pushed for a more robust treaty-based Organization for Security and Cooperation within Europe (OSCE) with a strong executive board like the U.N. and enforceable decisions but was met with

¹³⁰U.N. Department of Public Information. 'Former Yugoslavia – UNPROFOR', (1996).

¹³¹Jim Headley, 'Sarajevo, February 1994: The First Russia-NATO Crisis of the Post-Cold War Era', *Review of International Studies* Vol. 29 No. 2 (April 2003), 215.

¹³²Headley, First Russia – NATO Crisis, 212.

international disinterest.¹³³ In parallel, Western governments discussed NATO's extension to the east without considering the Russia's position on that matter. The narrative of a NATO guarantees not to expand to the east was refuted by the former Soviet President Gorbachev, one of its most prominent supporters.¹³⁴ Nevertheless, it seems, there was too little cooperation with Russia on that matter, as it left Russia with the feeling of not being an equal partner. NATO's airstrike intervention drove the further deterioration into the Bosnian War in 1995.

In 1995 the leadership of the Bosnian Serbs had decided to end the war within the year by taking the three U.N. protected, safe havens for the Muslim minority.¹³⁵ The Western decision process evolved around the dispute of peacekeeping vs. peace enforcing, as most nations had placed their forces under U.N. control for a "traditional peacekeeping" task. The horrors and U.N. failure witnessed at Srebrenica in July 1995 changed the allied openness and U.S. willingness for decisive intervention and finally led to the North Atlantic Council's decision to initiate Operation Deliberate Force.¹³⁶ This operation degraded the Bosnian forces to such a degree that it forced Bosnian leaders to the table and led to the Dayton Accords' signing in November 1995. Even though Russia did not intervene diplomatically for the Serbs, the infringement on Russia's perceived sphere of influence since 1993, and now open intervention was no less significant to the deterioration of the Russian – Western relationship.¹³⁷

Additionally in 1995, Russia finished another upgrade of its ABM system, deploying the A 135 ABM system, and showing constant work on developing missile defense beyond the end of the Cold War. As the A 35 ABM system before, the A 135 continued to carry nuclear

¹³³Flavio Dal Din. 'From the "honeymoon phase" to calling it a vulgar instrument" – how Russia's relationship with the OSCE has changed', (2018).

¹³⁴Hannes Adomeit, *NATO Osterweiterung: Gab es westliche Garantien?*, (2018).

¹³⁵Ivo Daalder. 'Decision to Intervene: How the War in Bosnia Ended', (1998).

¹³⁶Ibid.

¹³⁷Robert Owen, *Operation Deliberate Force: A Case Study On Humanitarian Constraints In Aerospace Warfare*, (2001), 70.

warheads on its interceptor missiles, while the U.S. had abolished this approach in 1976 by ending its missile defense deployment. Russia continued its work on strategic missile defense, but no tension arose between NATO and Russia over this topic. Figure 10 shows the distribution of the updated missile defense sites around Moscow.



Figure 10. Updated Missile Defense Sites – shows the distribution of missile defense systems around Moscow after its second upgrade.¹³⁸

Russia's strategic missile defense efforts focused heavily on Moscow as the symbol of a Russian empire but more importantly as it's the command-and-control center.

In 1997, the Memorandum of Understanding concerning the parties to the ABM treaty was signed to create a successor for the ABM treaty that had originally been signed by the U.S. and USSR. The nations that were signatories to the Memorandum were Belarus, Kazakhstan, Russia, and Ukraine. Even though the U.S. had proposed the ABM treaty to all post-Soviet

¹³⁸Global Security. *Sa-3 Site, Moscow*, Accessed July 29, 2021.

nations, only four had stayed in the negotiation.¹³⁹ While the only existing missile defense system interceptors that fell under the ABM treaty were stationed in Russia (Galosh in the vicinity of Moscow), other parts such as radars were stationed in other former Soviet nations such as Belarus. The signing effectively meant that the four named post-Soviet states could have one anti-ballistic missile area plus 15 launchers at the anti-ballistic missile test range, while Russia could continue its deployment of the Galosh system. The treaty effectively banned the other three nations from deploying anti-ballistic missile defense systems.¹⁴⁰ Part of the Memorandum was that the nations became part of the ABM treaty and its two Statements of Demarcation. The Statements of Demarcation opened to the nations the possibility to deploy interceptors with a velocity of less than 3km/s if they would not be tested against targets with a velocity of more than 5km/s, which basically excluded tests against intermediate-range ballistic missiles.¹⁴¹

Outside Europe developments unfolded that further deteriorated the NATO – Russian relationship. Iraq challenged the international community again in 1998, during the ongoing arms control crisis by barring U.N. inspectors from on-site inspection to identify potential sites for the production of weapons of mass destruction. The crisis escalated to the point where the U.S. and UK forces were bombing potential production sites to degrade Iraq's production capability. However, Iraq was an ally of Russia, and Operation Desert Fox was initiated without prior consultation with Russia, further infuriating Russian hardliners.¹⁴²

Furthermore, in 1998 the U.S. Secretary of Defense published a report covering the

¹³⁹Amy Woolf, *Anti-Ballistic Missile Treaty Demarcation and Succession Agreements: Background and Issues*, (2000), 5.

¹⁴⁰U.S. Department of State: *Memorandum of Understanding on Succession* (1997).

¹⁴¹Götz Neuneck, Christian Alwardt and Hans C. Gils, *Raketenabwehr in Europa* (Baden Baden and Hamburg: Nomos 2016), 215.

¹⁴²Vladimir Brovkin, 'Discourse on NATO In Russia During the Kosovo War', *Demokratizatsiya* Vol. 7 Issue 4 (1999), 7.

assessment of the ballistic missile threat to the U.S., stating that several states were developing ballistic missiles able to carry weapons of mass destruction, and any of these would be ready to strike the U.S. within five years after the decision to do so and only three months after North Korea tested a ballistic missile of its own.¹⁴³ This report triggered a newly perceived need for missile defense in the U.S., leading to the National Missile Defense Act of 1999. The act pushed for bilateral arms reduction in nuclear weapons while mandating the U.S. to "deploy as soon as is technologically possible a missile defense system that can defend the homeland from limited ballistic missile attacks - either accidental, unauthorized, or deliberate."¹⁴⁴

One of the more significant events to the NATO – Russia relationship was the Western intervention into the Balkan region in 1999 Kosovo Intervention. The conflict between Serbs and Kosovars had escalated in February 1998 to a civil war with war crimes and atrocities being committed to an extent that Europe had not seen for years without an intervention, Russia however, led by self-interest, blocked a U.N.-mandate to restore the peace.^{145, 146} Pressed by the destabilizing character of the conflict to the region, with migrants fleeing to Western Europe and under the impression of a "Responsibility to Protect," NATO decided to intervene against the Serbian regime of Slobodan Milosevic.¹⁴⁷ At the onset of the conflict, U.N. resolutions 1160 and 1199 created an embargo against Yugoslavia, condemned the outbreaks of violence, and demanded the parties to restore peace. An OSCE verification mission was in Kosovo to ensure compliance with human rights but was evacuated as violence flared up again after the Serbian side refused to sign the negotiated treaty of Rambouillet, which would have specified the

¹⁴³Missile Defense Advocacy Association. 'U.S. Missile Defense Policy', Accessed July 25, 2021.

¹⁴⁴Greg Thielmann. 'The National Missile Defense Act of 1999', (2009).

¹⁴⁵Oksana Antonenko, 'Russia and the Deadlock over Kosovo Russia', *Russie Nie Visions* No.21 (July 2007), 5.

¹⁴⁶Erik Yesson, 'NATO and Russia in Kosovo', *Perspectives* No. 13, Special Issue: The Balkans, NATO and European Security after the Kosovo War (Winter 1999/2000), 11.

¹⁴⁷Huma Haider. 'The responsibility to protect', (2013).

disarmament of Albanian Militias and a withdrawal of armed Serbian forces from Kosovo while deploying a 30,000 soldiers strong enabling NATO force to the region.¹⁴⁸ Again the West and Russia and voted for different approaches, but this time NATO was criticized for having stepped over the so far acknowledged lines of international law by relying on the so-called Responsibility to Protect for the intervention instead of an U.N. mandate which Russia had blocked. The events during the Balkan crises lead to a severe deterioration in the relationship between NATO and Russia. While NATO kept the door open for Russia to cooperate in missile defense it was a burden to the relationship adding up with following developments. Russian reactions to future missile defense developments have to be viewed, besides the Russian strategic goals achieved through propaganda, in the context of these past developments.

In March 1999, another significant test for the NATO – Russia relationship was the first NATO Enlargement, besides Germanies reunification in 1990, as NATO approved Poland, Hungary, and the Czech Republic for membership status.¹⁴⁹ Some argue that the severe fallout from the enlargement was avoided as no immediate debate broke out after the decision in 1997.¹⁵⁰ When the enlargement neared, the Russian Government may have abstained from confrontation, but Duma representatives voiced their concern and assumed evil intentions of NATO, using a moment of Russian weakness to expand.¹⁵¹ Later voices viewed the Russian reaction to NATO's 1999 intervention in former Yugoslavia as a result of NATO's enlargement the same year.¹⁵² It was another step adding to the already created void between East and West. While none of these steps was taken with evil intention towards Russia, all of them indicated to

¹⁴⁸OSCE, *Kosovo - An analysis of the human rights findings of the OSCE Kosovo Verification Mission October 1998 to June 1999* (Warsaw: OSCE 1999) 32.

¹⁴⁹Igor Zevelev, *NATO's Enlargement and Russian Perception of Eurasian Political Frontiers*, (2011), 8.

¹⁵⁰Szayna, Thomas. '142 The Enlargement of NATO and Central European Politics', (1997).

¹⁵¹Raymond Mas, 'NATO's Expansion: A Russian Perspective', *Insight Turkey* No. 12 (1998), 114.

¹⁵²Zevelev, *NATO's Enlargement*, 4.

Russia that the West would fight for its interests ignoring Russian concerns to an extent that showed a Western perception of Russia as a junior partner at best.

NATO published its next Strategic Concept in April 1999. In the wake of the humanitarian interventions of the 1990s, NATO had added Crisis Management and Partnership as core tasks to create security beyond its members' borders before a regional crisis could impact NATO's security.¹⁵³ The document, like its predecessor, stated the threat of missile and WMD proliferation but made a stronger statement on the need for missile defense to protect the alliance against WMD and their means of delivery. The threat of the rogue Iraq regime lead by Saddam Hussein and the uncovered WMD development and production programs by the U.N. inspections in Iraq had led to the impression of significant threat to the alliance. Missile defense acquired a more prominent role but again, not with a focus on Russia as a potential near-peer competitor but against unpredictable regimes outside the Euro-Atlantic Theater. The focus laid again on limited strikes.

Russia developed a new nuclear doctrine in 1999, introducing the idea of nuclear deterrence of conventional conflict, the first significant change since 1993, when Russia had ended the Soviet no-first-use policy reducing self-imposed limitations.¹⁵⁴ This Russian doctrine showed a new task for nuclear forces. In contrast, until this point, Russian nuclear forces had the task to conduct a massive (retaliatory) strike as part of a greater deterrence framework. While the Soviet Union had a concept of potentially winning a nuclear escalation in the sense of a major conflict, the new Russian doctrine connected potential nuclear weapons deployment with lower (regional) conflict escalation levels. Even though nuclear weapons use became a potent option, to Russia, for limiting a conflict, the Duma ratified START II in April 2000. It included,

¹⁵³NATO Heads of State and Government: *The Alliance's Strategic Concept 1999* (Washington DC: 1999).

¹⁵⁴Nikolai Sokov. 'Russia's 2000 Military Doctrine', (1999).

however, the caveat that the Russian Federation would only observe the limits specified by START II if the U.S. would stay a party to the anti-ballistic missile treaty. The ratification had been postponed several times due to NATO extension to the East and Military Operations in Iraq and Yugoslavia. From the Russian viewpoint, START II had the disadvantage of prohibiting land-based MIRVs. This limitation would require Russia to sustain nuclear forces (launchers and warheads) as close to the imposed limits as possible, to keep its deterrence capabilities.¹⁵⁵ Otherwise, its offensive potential could, in the Russian perception, be degraded by missile defense systems.

The number of nuclear warheads of the Soviet Union had changed in the period from 1990 to 2000 from 6,938 ICBM warheads to 3,544 and 1,378 to 760 for the launcher systems, that for the U.S. from 1,000 launchers to 500 and from 2,440 to 2,000 for ICBM warheads.^{156 157}

¹⁵⁸ The significant reduction in strategic arms indicated and general reduced tension between East and West and shifted priorities, beyond successful arms control treaties.

Hurt Russian Feelings. Between 1991 and 2000 was a period of extremes in the East-West relationship. Russia developed into a nation posed towards liberal internationalism but orientated then towards a more realist approach. It saw that Russian interests are not the same as Western interests by default. The relationship deteriorated significantly from 1994 when the West did not include Russia to the extent it wished during the Bosnian War, the Kosovo War, and finally, the NATO-East extension. Russia's desire for a stronger OSCE were not followed upon either.

¹⁵⁵Pikayev, *Rise and Fall of START II*, 15.

¹⁵⁶Norris and Cochran, *Nuclear Weapons Data Book*, 18 and 25.

¹⁵⁷Hans Kristensen, 'U.S. nuclear forces, 2001', *Bulletin of the Atomic Scientists* Vol. 57 Nr. 2 (2001), 78.

¹⁵⁸Hans Kristensen, 'Russian nuclear forces, 2001', *Bulletin of the Atomic Scientists* Vol. 57 No. 3, (2001), 79.

Summary

Historically the impact of missile defense on the East-West relationship seems in general stabilizing. In the period from 1959 to 1999, SALT I, SALT II, NPT, START I, START II, the Threshold Test Ban Treaty, the Limited Test Ban Treaty, the Comprehensive Test Ban Treaty, INF and the ABM treaty were signed or opened for ratification, ten treaties in total. Only one of which covered the topic of missile defense. All others covered offensive capabilities and focused on warheads or launcher systems. Still most negotiations on arms control included talks on missile defense or missile defense worked as an entry point for negotiations. Additionally, looking at the crisis that evolved during the Cold War, from Cuba to the deployment of SS-20 in Europe, there was none directly related to missile defense. During none of these crises was missile defense viewed by the U.S. or Soviet Union as a significant part of the following agreements. Yet, as pointed out before, the access-point to negotiation success for arms control treaties was repeatedly the exchange on missile defense. A field where agreements were predominantly influenced by U.S. domestic considerations and less by strategic needs.

The environment in which this stabilizing effect of missile defense could unfold was admittedly one in which missile defense would have had no realistic chance of significantly diminish adversarial strategic offensive capabilities. The U.S. and the USSR had too many launcher systems and nuclear warheads for a missile defense system to protect against a major strike. The deployed systems, however, could have (within their respective limits) provided protection against a very limited or accidental strike, which contributes to stability by enabling accidents to be contained. There were however several critical voices within the alliance that thought of missile defense as a factor that could lead to an arms race as the adversary would have to increase nuclear capabilities to keep up with the development of the defense. The reactions to

U.S. missile defense programs, however, were mostly contextually connected by economic, domestic, and diplomatic views and less based on strategic considerations.¹⁵⁹

There seems to be one aspect that would have had the potential to trigger a crisis or at least a heavy debate: space-based missile defense. Such a system would have meant an immense technological step forward with the potential to deny an adversarial nuclear attack given enough interceptors. But such systems would have also meant even greater costs than wider area missile defense already meant. The ABM treaty thus created an environment in which both signatories felt safe from a costly technological arms race that at least the Soviet Union could not have sustained. More importantly it freed resources especially for the Soviet Union to invest into ICBMs, thus contributing to the threat posed to the West. Nevertheless, an impact of missile defense existed during the Cold War, which was the fear of future developments. Signatories could legally withdraw from the ABM treaty within six months. The nuclear powers had to think about what if the cost factor of missile defense could be overcome, maybe with energy-beam-based systems. At the same time, the main driver of the rising numbers of nuclear warheads during the Cold War seems to be the number of adversarial nuclear warheads of the adversary. Another influence of missile defense exists in the form of creating a minimum level of nuclear weapons an opponent needs for deterrence. The minimum seemed to be set to a level of nuclear weapons that the missile defense systems will not be able to protect against with a reasonable probability. The equilibrium of deterrence can only be established beyond this point, at which arms control becomes easier. This concept of minimum limits touches the problem of deterrence between non-peer competitors, which is not part of this work. Figure 11 shows the number of U.S. and USSR strategic nuclear warheads over time combined with ABM developments,

¹⁵⁹Gardner, 'The Alliance And Missile Defense', 217.

relevant treaties, and crisis. Throughout the complete time period no ABM-development seems to have triggered the development in nuclear arms. Two scenarios could have been possible.

Firstly, the disproportionate increase of nuclear weapons after an adversary established a missile defense system. A scenario which did not show before the existence of the ABM-treaty, which in turn limited missile defense deployment. But even with the ABM-treaty there were potential developments that appear to have the potential to trigger reaction such as SDI. While the topic was discussed, and actions faced objections no significant breakout movements were visible. The ABM might have limited missile defense, each party could have withdrawn in accordance with the treaty. The lack of break out movement again underlines the absence of destabilizing impacts.

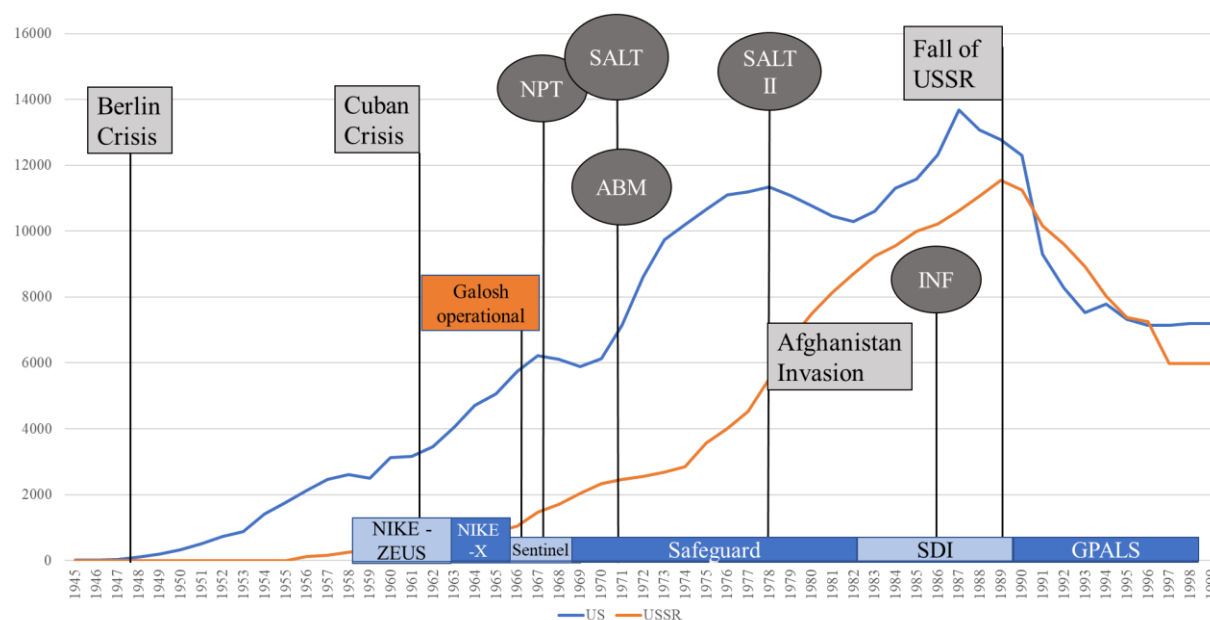


Figure 11. Cumulated numbers of U.S. and USSR strategic nuclear warheads over the period between 1945 and 1999. Included are important arms control treaties, crisis and phases of missile defense developments.

Secondly, the reduction of nuclear weapons or reduced speed of nuclear arms acquisition on the side that established a defense system. In the perception of the time and given the real

missile defense capabilities, no party was willing to reduce arsenals because of increased defense systems and, more importantly, no party saw itself pressed to increase warhead numbers caused by defense systems. The correlation factor between the U.S. and USSR numbers of warheads is 0.85 which indicates that offensive capabilities pressed the other side to acquire offensive capabilities. The correlation was calculated based on the numbers in the appendix. Other influence factors existed, but the perception of a disbalance in the deterrence by punishment balance was the main driver for arms acquisitions.

Figure 12 shows the same picture by comparing the launcher systems of each side. The correlation factor between U.S. and Russian/ USSR launcher numbers is lower at 0.66 but still significantly positive and likely the highest correlation factor compared to other potential influence factors, which were not part of this work.

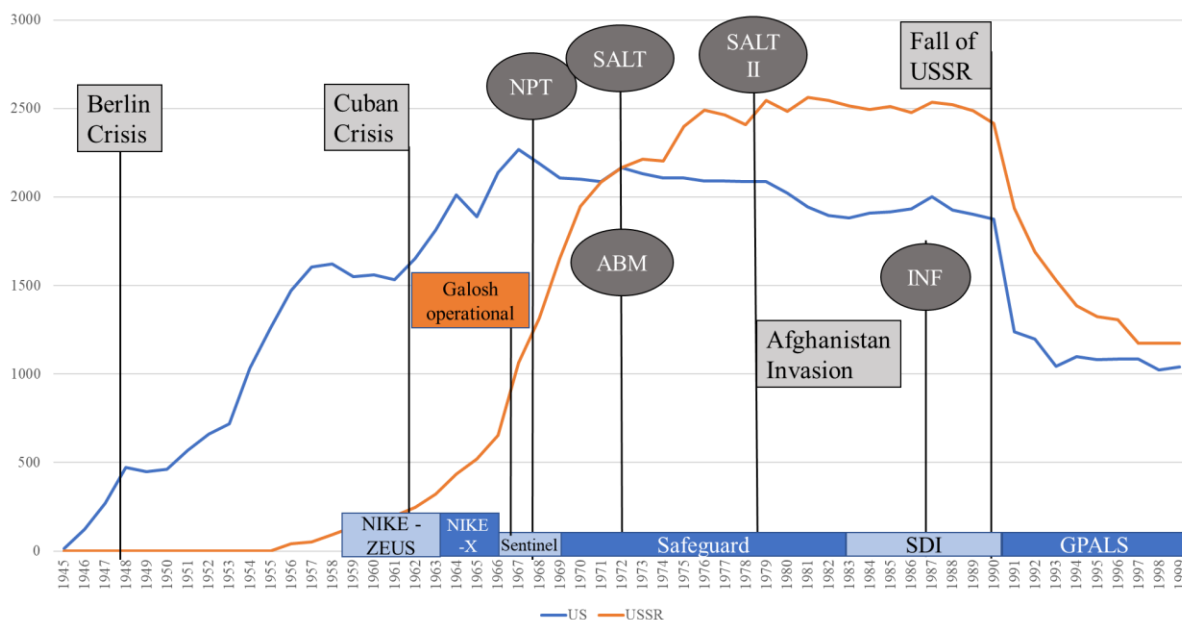


Figure 12. Cumulated numbers of U.S. and USSR nuclear strategic launchers over the period between 1945 and 1999. Included are important arms control treaties, crisis and phases of missile defense developments.

The ABM treaty was still intact in the 1990s when Western missile defense considerations were made, focusing on rogue regimes outside the Euro-Atlantic-theater. The post-Cold War period saw a significant reduction in offensive nuclear weapons, as the former conflict parties had no need for them anymore. The successors of the USSR were furthermore in no economic condition to maintain nuclear forces at such high levels. The perception of potentially lasting peace called for arms reduction. ABM-considerations during the 1990s did nothing to change the course towards arms reduction.

CURRENT SITUATION

This chapter covers the developments of NATO's missile defense efforts and the East – West relationship since 1999. The methodology is set analogous to that of the chapter on historical developments. The specific structure of NATO's missile defense framework is emphasized to create a picture of what is potentially seen as hostile by the Russian Federation.

Again, the historical developments are analyzed to establish a baseline for the relationship, then the description and comparison of NATO and Russian nuclear and missile defense arsenals will be used to discuss the existing deterrence posture. A comparison of NATO and Russian missile defense efforts and related official statements will indicate the current impact of respective missile defense programs. Finally, technological developments, and results from previous chapters will offer recommendations on how to proceed with strategic missile defense, should NATO wish to do so.

Recent Developments

The aftermath of the September 11, 2001, attacks on the United States carried the signs of a closer relationship between the United States and Russia. The Russian President Putin offered full support for counter-terrorism efforts and provided access to military bases in former Soviet republics.¹⁶⁰

Increase in Western Missile Defense Capability. In 2001, NATO started its development efforts for a theater ballistic missile defense system with two studies. The results were presented at the Prague 2002 Summit, and efforts were supplemented by a third study

¹⁶⁰Amy Woolf, *National Missile Defense: Russia's Reaction*, (2002), 21.

started by the NATO-Russia-Council in 2003, to determine the possible degree of interoperability between NATO's and Russia's missile defense effort to create a joint missile defense system.¹⁶¹ In 2005 the North Atlantic Council approved the creation of an Active Layered Theatre Ballistic Missile Defense (ALTBMD) system.¹⁶² The idea behind ALTBMD is based on lessons learned from the 1991 Gulf War to protect deployed forces against SCUD-missiles. While ALTBMD was a command-and-control infrastructure, the targeted missile type and the likely connected interceptors made it a theater and not a strategic missile defense effort.

In December 2001, the administration of U.S. President George W. Bush handed in the six months notice to withdraw from the ABM treaty. This step was, to an extent, coordinated with the Russian leadership. President Putin published a statement saying the step of the U.S. is a "mistake" but would not threaten Russian security.¹⁶³ Still, in 2001, the Russian Defense Minister announced that Russia would not implement the START II limitations as the U.S. had not yet ratified it, and when the U.S. left the ABM treaty, Russia declared START II null and void.¹⁶⁴ The restriction on land-based MIRVs, the most significant part of START II, was in turn lost along the end of the ABM treaty. Yet in a statement on the U.S. withdrawal in December 2001, President Putin had hinted at the desire for the reduction of offensive nuclear weapons. This desire led to negotiations with the Bush administration for a new treaty to lower offensive weapons below the limits of START I.¹⁶⁵ Both sides reached a consensus on a reduction of nuclear warheads. Still, they continued to debate the path to reduction. The U.S. preferred unilateral non-binding force reductions while the Russian side preferred codification of legally

¹⁶¹NATO. 'Ballistic Missile Defence', (2021).

¹⁶²NATO. 'Launch of NATO's Active Layered Theatre Ballistic Missile Defence (ALTBMD) Programme', (2005).

¹⁶³Vladimir Putin. 'Russian President Vladimir Putin's response to the U.S. decision to withdraw from the ABM treaty', (2001).

¹⁶⁴Nuclear Threat Initiative. 'Treaty between the United States of America and the Union of Soviet Socialist Republics on Strategic Offensive Reductions (START II)', Accessed July 17, 2021.

¹⁶⁵Daryl Kimball. 'The Strategic Offensive Reductions Treaty (SORT) At a Glance', (2017).

binding limitations for strategic forces. The treaty that followed this exchange was the Strategic Offensive Reduction Treaty (SORT) in 2003. It specified the reduction of strategic nuclear warheads to 1,700 - 2,200 for each party, without specifying their deployment domain.¹⁶⁶

The U.S. began building the first Ground Based Midcourse Defense (GMD) System interceptors in Alaska to create a limited homeland missile defense capability. Other existing systems did not have a relevant capability to defend the U.S. territory against ICBMs as they were geared towards medium and intermediate-range missiles or had limited ranges.¹⁶⁷ The Bush administration planned for another GMD site in Poland and an early warning radar in the Czech Republic to prepare the system for a potential threat from Iran.

Some Western voices, mainly anti-nuclear weapons movements, were even concerned about defensive systems to protect the U.S. against nuclear weapons.¹⁶⁸ Their fear was deducted from the fact that U.S. nuclear targeting in the 1960s considered Soviet missile defense a high priority target, thus establishing defense systems would reduce focus on arms reduction and instead create new targets. This in turn would lead to increased pressure to acquire nuclear arms on the adversarial side.

The U.S. planned 44 Interceptors combined with seven types of sensors to create a defense against limited strikes. The participating systems, their distribution, and links between systems are shown in figure 13. Even though GMD is a strategic missile defense system it was planned to be integrated into the missile defense framework to enhance sensor coverage. While GPALS had aimed for 200 targets and the 1999 National Missile Defense Act was build on an assumend threat that required 100 interceptors , GMD was planned with 44 interceptor

¹⁶⁶Treaty Between The United States of America and the Russian Federation on Strategic Offensive Reduction (SORT / TREATY OF MOSCOW).

¹⁶⁷Centre for Strategic and International Studies. 'Ground-based Midcourse Defense (GMD) System', (2021).

¹⁶⁸Hans Kristensen, 'The Protection Paradox', *Bulletin of the American Scientist* Vol. 60 No. 2, (2004), 68.

launchers.¹⁶⁹ The planned 44 launchers would have not provided protection against 200 warheads for the U.S., but the integration into a broader system also increased the probability of protection against missile strikes as it enhanced the ability to strike repeatedly against an incoming missile. At NATO's 2008 Bucharest Summit the allies welcomed the U.S. contribution of European based assets for NATO's protection and reaffirmed the will to cooperate with Russia in the field of missile defense.¹⁷⁰

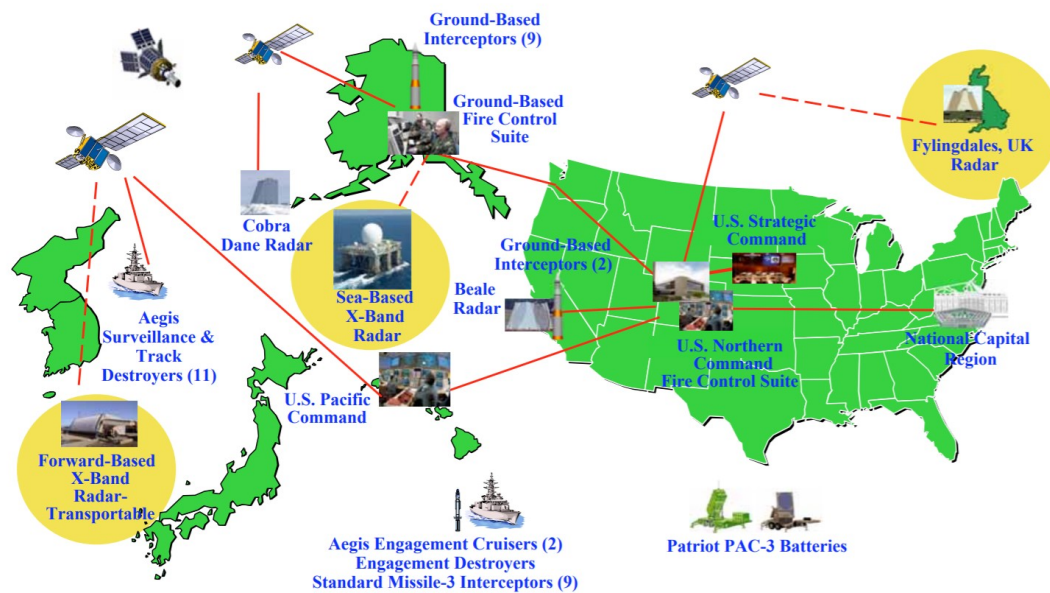


Figure 13 U.S. Missile Defense GMD – shows the configuration of GMD in 2006 connected to the terminal phase-oriented missile defense systems PATRIOT and AEGIS.¹⁷¹

Russian Shift Towards Nationalism. In 2003 and 2004, Western influence in Eastern Europe seemed to spike as NGOs were funding the opposition in Georgia, leading to the election of Pro-NATO president Mikhail Saakashvili.¹⁷² Similar protests (orange revolution) in Ukraine

¹⁶⁹Steven Pifer. 'The Limits of US Missile Defense', (2015).

¹⁷⁰ NATO Heads of State and Government, *Summit Declaration* (Bucharest: 2008).

¹⁷¹U.S. Missile Defense Agency. *Current System Configuration Block 2006*, Accessed June 27, 2021.

¹⁷²Alexander Thalís. 'Threat or Threatened? Russia in the Era of NATO Expansion', (2018).

lead to new elections, won by Western backed candidate Victor Yushchenko.¹⁷³ Russia was aware of these developments. President Putin had personally tried to impact the 2004 elections by traveling to Ukraine, recognizing the threat of color revolutions to Russia's political system, Russia shifted from a cooperative approach towards the West to a nationalistic one.¹⁷⁴

In March 2004, NATO expanded by another seven members, approving Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia as new members. Along with the territorial expansion also came an extension of NATO's air policing operations. NATO expansion in general and the deployment of Belgian F16 Jets to the Baltic Region added to the Russian view of being perceived as an adversary to the West. It was also seen as a further infringement on what Russia saw as its sphere of legitimate influence. NATO's expansion caused the Russian lower house of parliament to call on the President to reconsider treaties and cooperation with NATO and Russian defense posture, including nuclear doctrine.¹⁷⁵ The change in political stance and the very robust communication as a reaction to the Russian feeling of being surrounded marked another deterioration in the NATO- Russia relationship.

Russia started to communicate its concerns about European-based missile defense systems as early as 2006 and added public statements in 2007 trying to establish a red line for missile defense systems in Europe.¹⁷⁶ The then Russian Minister of the Exterior, Sergei Lavrov stated publicly in 2008 that the U.S. is trying to "surround Russia" and Russia does not fear ten interceptors but is increasingly worried about the trend of U.S. infrastructure being built

¹⁷³Thalis. 'Threat or Threatened?.'

¹⁷⁴Peter Dickinson, 'How Ukraine's Orange Revolution shaped twenty-first century geopolitics', (2020).

¹⁷⁵Steven Lee Myers, 'As NATO Finally Arrives on Its Border, Russia Grumbles', *The New York Times*, April 03, 2004.

¹⁷⁶Pavel Felgenhauer, 'U.S. Proposal To Base Missile Defense System in Poland, Czech Republic Raises Alarms in Moscow', *Eurasia Daily Monitor* Vol. 4 Issue 17 (2007).

constantly closer to the Russian border.¹⁷⁷ When Russia intervened in Georgia in August 2008, these aspects of Russian communication added to the Western perception of the Russian intervention as an act of revenge for the Western humanitarian intervention in the Balkan region and the lack of Western inclusion towards Russia in the development of Europe in general.¹⁷⁸ In the short period of five days, Russia intervened on behalf of the internationally not recognized Republic of Abkhazia and South Ossetia. Both regions were already in conflict with the Georgian Government. Russian, Georgian, and Ossetian peacekeeping forces were stationed in the region since 1991. The conflict, however, escalated in 2008 when violence between Ossetian Separatists and Georgia flared up. It is still debated whether Russia struck first or reacted justified by Georgian actions, but the result was still the same. Georgia lost its military structure, both regions, and any hope of becoming a NATO member. The Georgian War thus marked a turning point in the East-West relationship as Russia showed its capability and willingness to intervene for its interests outside its borders and put a forceful end to potential NATO expansions.¹⁷⁹ As a result, NATO's relationship with Russia declined further, as NATO suspended talks in the NATO- Russia Council. Russia, in response, stopped military cooperation with the Alliance and the Dmitry Medvedjev threatened to cut all ties.¹⁸⁰

At the 63rd General Assembly of the United Nations and a press conference two days later, Minister Lavrov prepared the field for a Russian proposal for a security system in Europe by laying out Russia's concerns about fundamental principles of international law in Europe.¹⁸¹ Russia renewed its desire for a new security framework in Europe. Such a new system even

¹⁷⁷Sergeij Lavrov cited on 'NTL.org. 'U.S. Trying to Surround Russia, Lavrov Says', (2008).

¹⁷⁸Ivan Krastev. 'Russia and the Georgia war: the great-power trap', (2008).

¹⁷⁹Michael Kofmann. 'The August War, Ten Years On: A Retrospective on the Russo-Georgian War', (2018).

¹⁸⁰Marcel de Haas, *NATO-Russia Relations after the Georgian Conflict*, (2009).

¹⁸¹Andrei Zagorski, *The Russian Proposal for a Treaty on European Security: From the Medvedev Initiative to the Corfu Process* in OSCE Yearbook (Baden-Baden: IFSH 1999), 45.

under a reformed OSCE as Russia had proposed earlier, would have guaranteed Russia an increase in influence and was aimed at making NATO obsolete. In a speech in October that year, President Medvedjev repeated the need to establish common Euro-Atlantic security policy rules that would not exclude any of the affected nations.¹⁸² He stated his concerns that if the actions of a small nation such as Georgia could destabilize the system, it is proof that it does not work. In light of the developments since 2004, the Georgian War shows the significant gains Russia was able to achieve during its intervention as it discouraged NATO from including Georgia as a member.

Even though Georgia would not become a NATO member, in April 2009, NATO expanded again by approving Croatia and Albania as new member states. This expansion meant another increase in influence in the Balkan region, where Russia still viewed itself as a protector of the Slavs. Russia had increased this narrative especially since its shift to the nationalistic policy since 2004. President Putin and nationalistic writers like Alexandre Dugin created a Slavophil narrative. This narrative puts Russia in a close connection to Europe as protective power to Slavic people and established a greater Eurasian vision with Russia as an empire in Europe and Asia.^{183, 184} The shift towards Eurasian narratives, and nationalism, indicated the deviation of Russian governments from Western values and put Russia on a conflict course with the West. Additionally, Russia perceived growing European Union influence towards its neighboring countries as a threat to its economy and security just as it did with NATO's influence.¹⁸⁵ It is important to note, the audience for President Putin's claims of an aggressive

¹⁸²Dmitry Medvedev. 'Speech at World Policy Conference October 08, 2008', (2008).

¹⁸³Tina Burret, 'Charting Putin's Shifting Populism in the Russian Media from 2000 to 2020', *Politics and Governance* Vol. 8 Issue 1 (2020), 199.

¹⁸⁴Paul Chaisty and Stephen Whittfield, *Putin's Nationalism Problem* in Ukraine and Russia: People, Politics, Propaganda and Perspectives (Online: E-IR 2015), 3.

¹⁸⁵John Gordon, Chapter Nine in *Domestic Trends in the United States, China, and Iran: Implications for U.S. Navy Strategic Planning* (Santa Monica: RAND 2008), 150.

West, hostile missile defense and NATO aggression, his own people. The warnings against external threats were aimed to create a united people supporting him as strong leader.¹⁸⁶ And while deterioration of the East – Western relationship supported him domestically, it also led him to add fuel to this perception. Missile defense in this context became an increasingly important part of Russia's communication which painted U.S. and NATO's efforts as hostile.

Reset in Russian – Western Relationship. The administration of U.S. President Barack Obama started a reset in the relationship in 2009. The deployment of missile defense systems to Poland and the Czech Republic was stopped to, instead, establish a system that would be more effective and available earlier.¹⁸⁷ The step was welcomed by Russia but appeared have caused irritation in the Czech Republic.¹⁸⁸ Further U.S. actions lead to slightly closer cooperation and to the end of the suspension of the NATO-Russia-Council talks.¹⁸⁹ However, the relationship did not recover to pre-conflict levels.

Also in 2009 the Obama administration decided to hold the acquisition of GMD silos at 30 instead of building 44, the drastic cut of interceptors along with the stop to build an early warning radar in the Czech Republic, was part of the reconciliatory policy towards Russia, as ten interceptors would have been stationed in Poland.¹⁹⁰ The Obama Administration's cut to missile defense in Europe caused disappointment in Poland and the Czech Republic as it implied the image of an unsteady U.S. policy regarding NATO missile defense.¹⁹¹ The negative impact on the alliance relationship seems greater than the achieved reconciliation with Russia. The Russian

¹⁸⁶Pierre Hassner, 'Russia's Transition to Autocracy', *Journal of Democracy* Vol. 19 No. 2 (April 2008), 11.

¹⁸⁷James Joyner. 'Obama Abandons Poland and Czech Missile Defense', (2009).

¹⁸⁸Barack Obama cited in 'RFEI U.S. Dramatically Alters Plans For European Missile Defense', *Radio Free Europe*, last updated September 17, 2009.

¹⁸⁹U.S. Office of The Press Secretary. 'U.S.-Russia Relations: "Reset"', (2010).

¹⁹⁰Philip Devoe. 'Strategic Vulnerability: Obama's Drastic Cuts to Missile Defense', (2017).

¹⁹¹Luke Harding and Ian Traynor, 'Obama abandons missile defence shield in Europe', *The Guardian*, September 17, 2009.

key demand, a legally binding limitation of NATO/U.S. missile defense capability, was not met. To mitigate the negative impact of the cut, the Obama administration introduced a new approach for missile defense in Europe, called the European Phased Adaptive Approach (EPAA). This approach was based on other interceptors that would be available sooner. The reasoning behind this change was communicated, as based on new intelligence on Iran calling for a sooner deployment.¹⁹² This communication showed Russia that the change was caused only because of considering Iran and not Russia. Russia's security concerns seemed less important than the possibility of a future Iranian threat, leaving Russia unwilling to make any concessions of its own. The shift from GMD to EPAA was more than a cut in capability it meant also shifting from U.S. protection for NATO towards increased NATO missile defense integration. While the U.S. still provided the lion's share of the system, the shift meant that integration and contribution with AEGIS-ships, ports for these ships, land-based sites, and infrastructure became easier.

The U.S. Congressional Budget Office released a study in 2009 comparing four different options of stationing missile defense systems in Europe. The options were, stationing of silo-based (GMD) missile defense, ship-based AEGIS¹⁹³ interceptors, interceptors on U.S. bases in Germany and Turkey, or energy-based interceptors.¹⁹⁴ The study analyzed the ability of each option to defend Europe and the U.S. against Iranian missiles. For the case of Russian ICBMs, it came to the conclusion that while partial defense against Russian ICBMs is possible, the number of Russian missiles compared to the planned interceptors make NATO's missile defense system easily penetrable through use of overwhelming numbers by Russia.¹⁹⁵ The study results showed that the missile defense system could mitigate a limited missile attack without endangering

¹⁹²Barack Obama. 'Remarks by the President on Strengthening Missile Defense in Europe', (2009).

¹⁹³AEGIS – named after the Shield of ZEUS.

¹⁹⁴Congressional Budget Office. *Options for Deploying Missile Defense*, (2009), 15 -19.

¹⁹⁵Congressional Budget Office. *Options for Deploying Missile Defense*, (2009), 41.

Russia's offensive deterrence capability. The U.S. Government released its revised Ballistic Missile Defense Review in February 2010, defining Iran and North Korea again as the predominant missile threats to the U.S..¹⁹⁶ The review states:

Today, only Russia and China have the capability to conduct a large-scale ballistic missile attack on the territory of the United States, but this is very unlikely and not the focus of U.S. BMD. As the President has made clear, both Russia and China are important partners for the future, and the United States seeks to continue building collaborative and cooperative relationships with them. With Russia, the Administration is pursuing an agenda aimed at bringing the strategic military postures of the two countries into alignment with their post-Cold War relationship – no longer enemies, no significant prospect of war between them, and cooperating when mutually advantageous¹⁹⁷

It provides a clear communication that Russia is not the reason for U.S. missile defense to be developed and deployed. The document names North Korea and Iran as the reason for missile defense necessity. While the U.S. characterizes both nations as regional threats, their missiles have ranges not capable of reaching the U.S. but are able to reach the territory of allies. The document explicitly excludes Russia from being the reason for the missile defense, stating that Russia could easily overcome the System because of its large scale nuclear capabilities.

The revision of the U.S. missile defense review was accompanied by the revision of NATO's strategic concept. NATO's new 2010 Strategic Concept has the title "Active Engagement, Modern Defense" and provides an overview of the security environment.¹⁹⁸ In this overview, it stands out that NATO does not state the threat of a near-peer or peer-competitors but lists prominently nuclear and ballistic missile proliferation. While stating the existence of differences with Russia in specific areas, it defines Russia as a partner in counter-terrorism, counter-narcotics, and interestingly in missile defense.¹⁹⁹ NATO defines missile defense as one

¹⁹⁶U.S. DOD, *U.S. Ballistic Missile Defense Review 2010* (Washington DC: 2010), 4.

¹⁹⁷*Ibid.*

¹⁹⁸NATO Heads of State and Government: *Strategic Concept* (Lisbon: 2010).

¹⁹⁹NATO Heads of State and Government, *Strategic Concept 2010*, 30.

of its tasks, for which NATO seeks deeper consultation with Russia and other Euro-Atlantic allies. The definition of Russia as a partner is an expression of the reset of the post-Georgia Russian-Western relationship encouraged by the Obama administration.²⁰⁰

In 2010, NATO's ALTBMD reached a key milestone: the ability to integrate different theater missile defense systems of NATO members.²⁰¹ With NATO's focus on ALTBMD it played no part on the strategic missile defense level, however, the impact of a missile defense framework should not be underestimated. A well-developed theater missile defense system could integrate more advanced assets or could support such with its sensors by enhancing coverage. Still the development was not met with Russia information operations measures.

Cooperation with Russia went on, and in 2011 the New Strategic Arms Reduction Treaty (New START) came into force, limiting the number of deployed strategic warheads for the U.S. and Russia to 1,550 and adding limits to launcher systems.²⁰² New START replaced SORT from 2003, specifying again lower limits while adding limits on launcher systems. The treaty indicates the willingness of the parties to reduce costly nuclear offensive systems to the necessary minimum. Missile defense perceived as extensive or easy upgradable could endanger this intent by setting a minimum for nuclear arsenal to sustain deterrence. This minimum would then be a number of nuclear forces able to overcome adversarial missile defense with a satisfying probability for the deploying nation. Still the number of 1,500 warheads does not appear to be low enough for this to be relevant, compared to the missile defense systems in existence. During the negotiation of New START, Russia voiced its concern about U.S. missile defense. Russia stated that New START would be viable only as long as no build-up of missile defense systems

²⁰⁰Steven Pifer, *US-Russia Relations in the Obama Era: From Reset to Refreeze?* in OSCE Yearbook (Baden-Baden: IFSH 2015), 111-112.

²⁰¹NATO, 'Launch of NATO's Active Layered Theatre Ballistic Missile Defence (ALTBMD) Programme'.

²⁰²Martin Russel, *The New START Treaty between the US and Russia*, (2021), 1-3.

could be viewed as a threat to Russian nuclear capabilities, leading to the inclusion of such a build-up as one of the extraordinary events legitimizing a withdrawal from New START, according to its Article XIV.²⁰³

At the Lisbon Summit, NATO decided to develop missile defense “to protect all NATO European populations, territory and forces, and invited Russia to cooperate.”²⁰⁴ Russia had communicated its concerns over this development, fearing to lose the role as a global power if NATO mitigates Russian ballistic missile capabilities. For example President Medvedjev announced significant ballistic missile development and countermeasures if Russian concerns are not heard.²⁰⁵ As NATO proceeded, Russia stationed short-range ballistic missile forces on its borders and in Kaliningrad. NATO's missile defense at this point was no threat to Russian missiles. Extensive communication efforts were undertaken that Russia was not the target of any such measures. The Russian government, nonetheless, saw NATO activities along its borders as aggressive and grew increasingly aggravated about it. Like the Soviet Union, Russia seems to know only enemies or vassals along its borders.²⁰⁶ The restart approach in the NATO/U.S. – Russian relationship at this point was failing.

NATO released its Deterrence and Defense Posture Review in 2012, in which it defines a comprehensive deterrence approach with nuclear weapons as the core alongside conventional and missile defense forces.²⁰⁷ The document again did not mention Russia as the aim for missile defense efforts. In 2012 NATO had and still has only a limited missile defense capability, which also indicates that the targeted entity of the missile defense system was not Russia as the capacity

²⁰³U.S. Department of State: *Statement of the Russian Federation Concerning Missile Defense* (2010).

²⁰⁴NATO Heads of State and Government: Summit Declaration (Lisbon: 2010).

²⁰⁵Carmen Cirigli. *Russian reactions to NATO missile defence*, (2012).

²⁰⁶Fareed Zakaria, 'A Guest of My Time', *New York Times*, February 23, 2014.

²⁰⁷NATO Heads of State and Government: *Deterrence and Defence Posture Review Press Release* (Chicago:2012).

would not have threatened Russia's offensive capabilities. Still, the cooling in the relationship became more obvious when Russia announced the permanent stationing of its Iskander-M missile forces in Kaliningrad that it had stationed there in 2011 due to NATO's Missile defense efforts in 2011.²⁰⁸ In 2013, Russia terminated the cooperation on missile defense unilaterally after NATO plans proceeded for European missile defense and after having refused various proposals for cooperation on the basis that NATO refused to sign legally binding documents assuring Russia that NATO BMD would not be able to intercept Russian missiles.²⁰⁹ At the same time it is important to understand the physical limitation is such diplomatic ideas. It seems unlikely that NATO could be able to intercept a small scale Iranian ballistic missile attack without not being able to intercept a Russian missile. Even though Russian missiles may not be the stated target, the existence of an Iran focused defense systems would open a window of opportunity to intercept Russian missiles. Depending on the real configuration of sensors and weapon platforms and the missile the window could be longer or smaller. The difficulty to create a defense system against one nation but not creating at least limited protection against another are immense.

Ukraine 2014 A Turning Point

In 2014, Russia openly questioned the stability in Europe by invading Ukrainian districts, occupying the Crimean Peninsula and parts of the Oblast Kherson, and helping to create two separatist republics on Ukrainian territory, the People's Republics of Luhansk and Donetsk. Russia used a massive disinformation campaign to blame Ukraine and classify the conflict as a

²⁰⁸Steve Gutterman, 'Russia has stationed Iskander missiles in western region: reports', *Reuters*, December 13, 2013.

²⁰⁹Frank Rose. 'Missile Defense as a Hedge', (2016).

civil war between Ukrainians and oppressed ethnic Russians in Ukraine, with Russia taking control over Crimea only to secure its military installation there.²¹⁰ Western media outlets repeated the Russian narrative of an internal Ukrainian conflict. Russia later admitted parts of the aggression but still tried to blame Ukraine for the necessity by comparing Russia's actions to the Western intervention in Kosovo.

Some researchers suggest that acknowledging the conflict as, at least in part, a civil war could help solve negotiation challenges.²¹¹ This perspective, however, has the dangerous potential of absolving Russia of its interventionist violations of international law. Russia supplemented its conventional military actions by adding nuclear signaling in the form of significantly increased global activities of its strategic nuclear bombers.²¹² The conflict left Ukraine barred from a potential NATO membership and destabilized for the foreseeable time. The Russian violation of Art 1 U.N. Charter and the Budapest Memorandum created a deep gap between NATO and Russia, as NATO member states sanctioned Russia for its aggression, and cooperation was stopped completely. The NATO- Russia council was halted for two years but reinstated in 2016 to resume a diplomatic exchange and ease the tension. Again in 2016, Russia announced the build-up of its military forces as a reaction to NATO's alleged build-up of forces close to the Russian border.²¹³

In May 2016, NATO Secretary-General Jens Stoltenberg published an opinion piece on missile defense in NATO's framework, mentioning the European theater's systems.²¹⁴ Important to note is his strong expression of the character of NATO's missile defense efforts, as not

²¹⁰Peter Dickinson. 'Putin blames anyone but himself for loss of Ukraine', (2021).

²¹¹Jesse Driscoll. 'Ukraine's Civil War: Would Accepting This Terminology Help Resolve the Conflict?', (2019).

²¹²Jacek Dukralec, *Nuclear-Backed "Little Green Men: Nuclear Messaging in the Ukraine Crisis* (Warsaw: Polish Institute of International Relations 2015), 10 -11.

²¹³Dmitry Solovyov and Lidia Kelly, 'Russia warns of retaliation as NATO plans more deployments in Eastern Europe', *Reuters*, May 04, 2016.

²¹⁴Jens Stoltenberg. 'Defending our nations from ballistic missile threats', (2016).

targeting Russian even though Russia had already shown its aggression and ability to invade other countries if it serves Russian interests. Stoltenberg wrote:

“..., we could not use them offensively even if we wanted to. Nor does the system represent any threat to Russia’s strategic nuclear deterrent. Geography and physics both make it impossible for the NATO system to shoot down Russian intercontinental ballistic missiles. The interceptors are too few in number, and either too far south or too close to Russia to do so. “

It is interesting to note that he states the technological challenge of missile defense systems to intercept missiles with a launch point close to them. Russia repeatedly communicated demands not to station missile defense in Eastern Europe as it would be seen as aggression; however, the aggression seems to lie rather in the general stationing of military systems than in the stationing of missile defense, a location farther away from Russia could actually enable NATO systems to intercept Russian missiles. Even if this was the case, Stoltenberg repeated in his text that Russian capabilities are too strong in numbers for NATO to pose any threat with missile defense to them. Beyond the point of existing missile defense systems being no threat to Russia, the Russian aggression in Ukraine and the stationing of Iskander systems in Kaliningrad indicated a new need for missile defense to secure national air spaces in Europe.²¹⁵ Russian aggression, it appears, created the need for the system Russia saw as detrimental to its interests and stability.

In May 2017, NATO expanded further into the Balkan region by taking the Republic of Montenegro into the Alliance. According to the Montenegrinian government, Russia had worked hard to block a further NATO expansion by allegedly trying to assassinate its prime minister,

²¹⁵Luc Dini, 'Integrated Anti- Missile Air Defence (IAMD) In Europe: Complexity And Consensus?', *Quarterly Bulletin of the Council of European Aerospace Societies Issue 2* (2016), 25.

indicating the strong opposition it had for expansion.²¹⁶ This Russian opposition towards NATO expansion is important when it comes to identifying the real impact of missile defense in the relationship.

New Focus On Missile Defense. The U.S. government released a revision of its 2019 Missile Defense Review in November 2018. The change in title from Ballistic Missile Defense Review in 2010 to Missile Defense Review in 2019 indicates a broader approach to missile defense. The document, therefore, includes in its threat analysis both cruise missiles and gliding vehicles.²¹⁷ The document's threat analysis included a significant shift in the wording towards Russia by characterizing Russia as a Nation that considers the U.S. and NATO as a "threat to its contemporary revisionist geopolitical ambitions and routinely conducts exercises involving simulated nuclear strikes against the U.S. homeland."²¹⁸ However it then turns to the statement that missile defense is no threat to Russia as the U.S. relies on (offensive) deterrence capabilities to deter the Russian and Chinese ICBM threat. The necessity for missile defense is, according to the document, to outpace the development of "existing and potential rogue state offensive missile capabilities." Some voices characterize the document as a "good start," but a lot is still to be done as the documents endorsed integration of missile defense and the creation of a space sensor layer, only two of the listed items which require significant efforts.²¹⁹

In August 2019, the U.S. left the INF treaty after having provided six months for Russia to end its alleged violation of the treaty after being accused of doing so for years.²²⁰ Russia used this opportunity to declare the treaty's restriction non-binding and its intention to create

²¹⁶Ivana Sekularac, 'End of the affair: Montenegro jilts Russia by joining NATO', *Reuters*, May 22, 2017.

²¹⁷U.S. Department of Defense, *Missile Defense Review* (Washington DC: 2019), II.

²¹⁸*Ibid.*

²¹⁹Thomas Karako, 'The 2019 Missile Defense Review: A Good Start', (2019).

²²⁰Shannon Bugos, 'U.S. Completes INF Treaty Withdrawal', (2019).

symmetry with the U.S. by deploying missiles in case the U.S. did.²²¹ The end of the treaty, while being a blow to international arms control, did not lead to the voiced scenarios of a European arms race. Still new technologies were developed like the new Russian cruise missile SSC-8, which was the main weapon system that led to the end of the INF treaty.

In 2020, NATO approved yet another enlargement and took in North Macedonia. Again Russia had put in the significant effort during North Macedonia's candidate status to deviate it from NATO membership.²²² Because of NATO's Balkan expansion, Russia has lost significant influence in the region and the possibility of indirect access to the Mediterranean Sea. Arguably, Russia did not only lose by NATO taking North Macedonia in, the country has a significant pro-Russian opposition which could develop into a challenge for NATO's decision making if the political situation in the country would change.

In February 2021, the Biden administration renewed New START keeping the last arms control pillar, explicitly specifying a limit on offensive nuclear capabilities, intact.²²³ The treaty is still essential as it defines a number of nuclear warheads and launcher systems that both signatories deem enough to deter the other.²²⁴ New START will have to be renewed in 2026. Given the current technological advances in carrier systems that will not be covered under New START, new negotiations could be necessary in order to limit offensive capabilities to the necessary minimum. The treaty's extension indicated that Russia is not willing to give up the agreed limit on offensive nuclear weapons even though it has already once indicated that New START depends on the U.S. refraining from increasing its BMD capability.

²²¹Vladimir Putin, cited in, 'Putin: We'll target USA if Washington deploys missiles in Europe', *Reuters*, February 20, 2019.

²²²Yordan Tsalov. 'Russian interference in North Macedonia: A View Before the Elections', (2020).

²²³Russel, *The New START Treaty between the US and Russia*, 1-3.

²²⁴Wolfgang Richter, *USA und Russland verlängern New Start*, (2021).

The New Cold War? The current relationship between Russia and the West is a result of many failed attempts to coexist. Inflated Russian expectations to be perceived as a global power and be treated as an equal partner and too little Western consideration of Russia's interpretation of developments lead to a deep divide. What looked like a new era in the early 1990s developed into something called a "new Cold War," as Russia violated the territorial integrity of Ukraine and influenced global politics to achieve detrimental outcomes for NATO, for example, by supporting Syria, which violated the Chemical Weapons Convention. Even though comparing Russia to the Soviet Union is exaggerated, the situation appears to have come to a low point it has not reached for decades. Already in 2012, Russia threatened to deploy nuclear weapons to Kaliningrad to deter NATO from deploying an early warning radar to Turkey.²²⁵ In an attempt to pressure the West towards a new reformed Euro-Atlantic security framework, Russia achieved to present itself as a rogue regime that had left the United Nations consensus.²²⁶ This may have benefited President Putin's domestic political situation, but it hurt the underlying Russian idea to be perceived as an equal partner. Throughout this development missile defense played a role in Russia's communication as an alleged aggression of NATO. This series of events indicates that the Russian protest against NATO missile defense is a byproduct of events and not the trigger. President Putin had stated in 2001 that U.S. missile defense is no threat to Russian security. He changed the tone when NATO intended to deploy missile defense to Europe. Therefore, it is essential to analyze NATO's current missile defense system and future plans to indicate NATO's ability to threaten Russian missile defense. Figure 14 shows the development of nuclear warheads between Russia and the U.S. between 1999 and

²²⁵Gardner Hall. 'Toward a new Euro-Atlantic security framework', (2008).

²²⁶Ibid.

2019. Including significant ABM events, crisis and arms reduction treaties, there appears no relationship between missile defense and numbers of nuclear warheads. Again, as in the period before the main driver for nuclear arsenal developments was not missile defense. The correlation between U.S. and Russian numbers of nuclear warheads is 0.94, the high correlation is created by the modern arms reduction treaties setting lower limits than their predecessors and both signatories engaging in arms reduction. The correlation was calculated for the numbers of nuclear warheads of the U.S. and Russia in the period from 1999 to 2019 based on the numbers in the appendix.

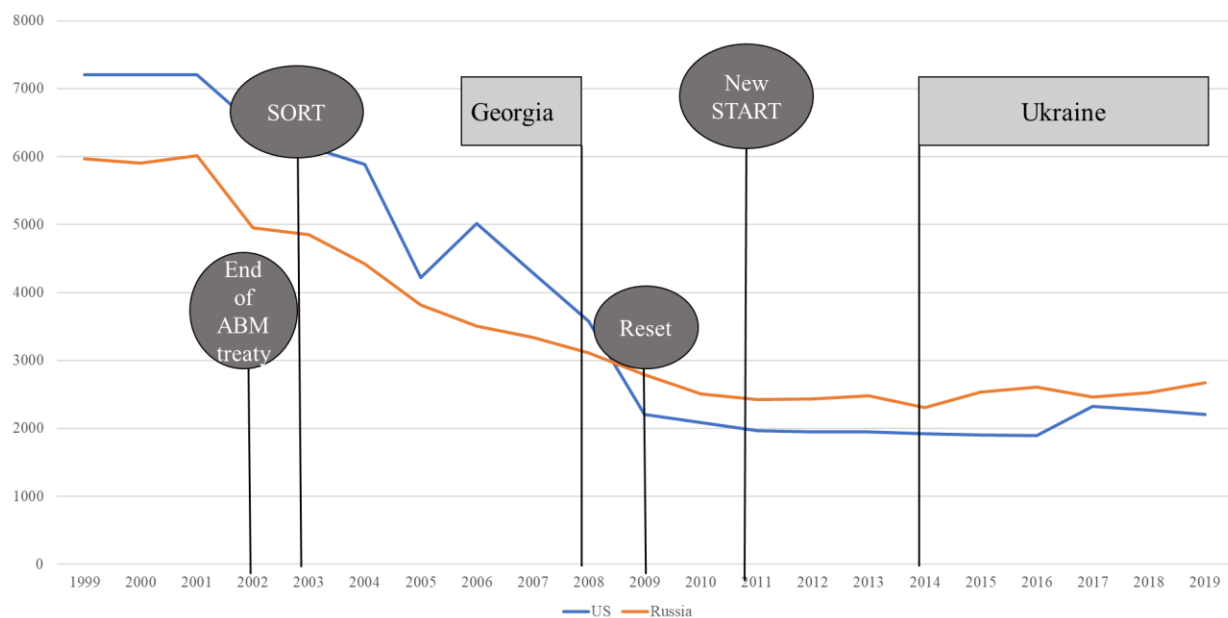


Figure 14. Number of Nuclear Warheads since 1999 - The development of U.S. and Russian Nuclear Warheads over time.

Current NATO Missile Defense

The description starts with the characterization and general overview of NATO's missile defense, including the main theater missile defense systems. The overview of their capabilities

and numbers enables characterization of NATO's systems as either Russian ICBM-centric or focused on regional threats. It enables further a comparison in scale between Western missile defense capabilities and Russian offensive nuclear arsenals.

Overview. NATO's current missile defense system is created by integrating several national sites and systems. The U.S. directly contributes to this system with the European Phased Adaptive Approach (EPAA).²²⁷

According to NATO, Romania and Poland provide for missile defense through the stationing of AEGIS Ashore batteries. Germany hosts the command center. Spain provides a port for AEGIS capable ships and other allies provide force protection assets to the system. NATO's European theater ballistic missile defense is depicted in Figure 15 with its locations and contributors. The distribution shown indicates a focus to the south and the east. For an analysis of which country is the primary target of the systems, further factors have to be considered.

Additionally to the listed voluntary contributions to NATO's ballistic missile defense, NATO's members provide personnel, and funds for the Integrated Air and Missile Defense Centre of Excellence to enhance and develop integrated air and missile defense capabilities.²²⁸ Nevertheless, the main contribution to NATO's missile defense in Europe is EPAA, which supplements the Iranian-centric part of U.S. missile defense and extends protection to Europe.²²⁹ It is a U.S. contribution and linked to NATO's missile defense efforts but not part of NATO's force structure.

Tasks. Under NATO's 2010 Strategic Concept, missile defense serves three purposes: to protect NATO's territory and population against the threat of ballistic missile attacks as a

²²⁷NATO, 'Ballistic Missile Defence'.

²²⁸Integrated Air and Missile Defense Centre of Excellence. 'Mission', Accessed July 24, 2021.

²²⁹Ian Williams. 'Achilles' Heel: Adding Resilience to NATO's Fragile Missile Shield', (2019).

contribution to collective defense, enhance cooperation with Russia, and enhance cooperation with other Euro-Atlantic-Partners.²³⁰

Planning, Command ,and Control. Missile defenses in NATO are part of NATO's Integrated Air and Missile Defense Approach.²³¹ NATO's senior body responsible for missile defense policy is the Air and Missile Defence Committee, while the Conference of National Armament Directors is responsible for steering the BMD program, which aims at the development of technical functionalities.²³²



Figure 15. NATO Missile Defense European Theater – shows the different effector and sensor sites as well as contributing nations.²³³

²³⁰NATO Heads of State and Government: 2010 Strategic Concept (Lisbon: 2010).

²³¹NATO, 'NATO Integrated Air and Missile Defence'.

²³²NATO, Ballistic Missile Defence, Last updated June 07, 2021.

²³³NATO. #NATO Defence & Deterrence [9 of 9] – Ballistic #Missile Defence, Accessed July 25, 2021.

NATO's development and standardization in missile defense are supported by various institutions within NATO's framework or connected to it.

NATO's missile defense follows a layered approach, where ballistic missile defense systems are protected by theater missile and air defense assets down to the tactical level of conventional forces.

Missile Defense Systems. The most capable missile defense system is GMD, stationed in the United States, with the ability to intercept ICBMs midcourse. Other interceptors in the NATO arsenal are provided by the Terminal High Altitude Area Defense (THAAD) system, AEGIS/AEGIS Ashore, PATRIOT, and SAM P/T.

The GMD system is designed to counter long-range ICBMs threatening the U.S. homeland. In the layered missile defense approach of the U.S., GMD has the earliest chance to terminate an incoming threat due to its range. GMD's interceptor distribution is shown in figure 16.

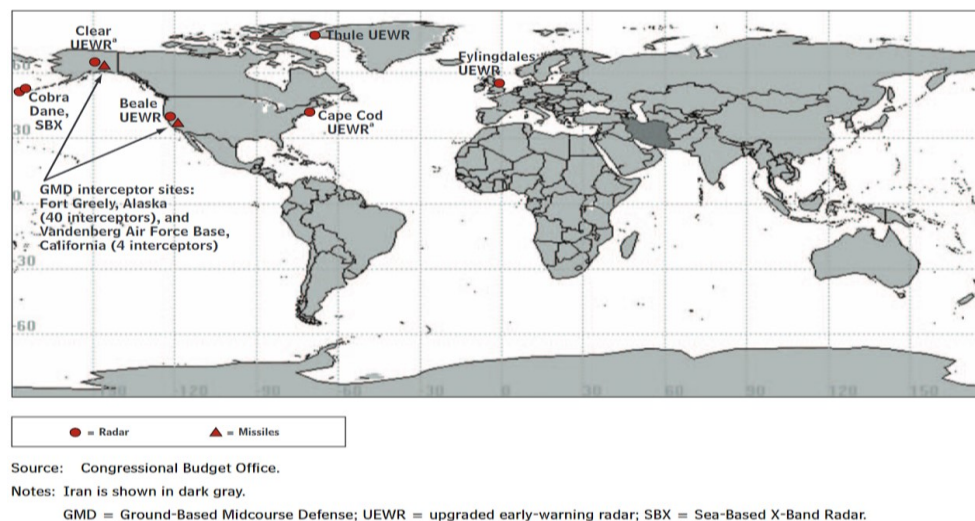


Figure 16. Ground Based Midcourse Defense Sites- shows the distribution of GMD sensors and effectors.²³⁴

²³⁴CBO, *Options for Deploying Missile Defense*, 2009.

It is a silo-based system targeting a missile in its midcourse trajectory phase by hitting it with an exo-atmospheric kill vehicle.²³⁵ As shown in figure 16, the 44 interceptors of the systems are stationed in Alaska and California. None of the interceptors are stationed in Europe, due to the Obama administration's cut to the plan to station ten interceptors in Poland.

The System has been operational since 2004, and modernization was approved in financial year 2016 to develop a Multi-Object Kill Vehicle to adapt GMD to the threat of MIRVs. The U.S.-focused protection established by GMD against an Iranian attack is shown in figure 17.

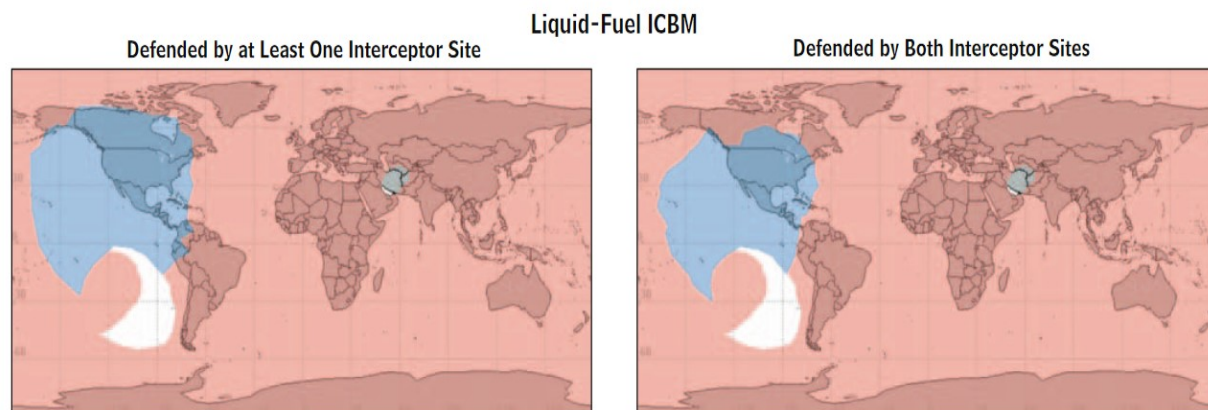


Figure 17. GMD Coverage - shows the protection established by GMD against Iranian liquid-fueled ICBM (higher threat than solid fuel).²³⁶

AEGIS is a ship-based anti-ballistic missile system that targets medium-range, intermediate-range and intercontinental ballistic missiles, depending on the interceptor deployed. The SM-3 missile is a midcourse interceptor with Block IIa targeting ICBMs once it will be operational, but Aegis also employs SM-2 and SM-6, which are terminal phase interceptors.²³⁷ Aegis SM-3 Block IIa successfully intercepted an ICBM representation during a test in

²³⁵Centre for Strategic and International Studies. 'Ground-based Interceptor (GBI)', (2019).

²³⁶CBO, *Options for Deploying Missile Defense*, 2009.

²³⁷Ronald O'Rourke, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress* (Washington DC: Congressional Research Service August 27, 2020), 4-5.

November 2020. Aegis ashore is the land-based configuration of the system, which is infrastructure-based without mobility.

The stationing of AEGIS ashore systems in Poland, and Romania is part of the EEPA-plan introduced by the Obama administration in 2009 as a substitute for the planned and canceled deployment of GMD to Poland.²³⁸ Besides the AEGIS ashore sites NATO members Spain, Norway, Canada, and the U.S. had 98 AEGIS ships and planned an increase to 122.^{239, 240,}
²⁴¹ The system is currently a theater missile defense system.

PATRIOT is the oldest of NATO's missile defense systems. It was introduced as a mobile air defense system in the 1960s and developed with the PATRIOT Advanced Capability 2 package into a missile defense system in 1986.²⁴² PATRIOT defends an area of 25 by 40 kilometers against the threat of tactical ballistic missiles.²⁴³ The PAC3 package enables PATRIOT to intercept theater ballistic missiles.²⁴⁴ The NATO nations that deploy PATRIOT are the U.S., Spain, Romania, Poland, Netherlands, Greece, Germany. PATRIOT is a mostly tactical system as PAC3 is not the installed upgrade on most of the systems, however, it is listed here as it is part of the NATO's layered approach. NATO has slightly over 70 Batteries, with 33 being stationed in the U.S.²⁴⁵

THAAD is a medium-tier missile defense system that defends an area within a 200km radius and can intercept endo and exo-atmospherically with a hit to kill vehicle.²⁴⁶

²³⁸Joseph Day: *Ballistic Missile Defense and NATO* (2017), 4.

²³⁹Xavier Vavasseur. 'Fincantieri's FREMM Wins US Navy FFG(X) Frigate Competition', (2020).

²⁴⁰Xavier Vavasseur. 'Lockheed Martin Press Release SNA 2020: Four Nations to Be Protected with Lockheed Martin's Next Generation SPY-7 Radar', (2020).

²⁴¹U.S. Navy. 'AEGIS', Accessed August 14, 2021.

²⁴²Centre for Strategic and International Studies. 'Patriot', (2021).

²⁴³Kenneth Werrel, *Hitting a Bullet with a Bullet A History of Ballistic Missile Defense*, (2000), 46.

²⁴⁴Kris Osborn. 'Army Extends PATRIOT Missile Tech-Improvement & Ponders New Upgrades', Accessed July 26, 2021.

²⁴⁵Missile Defense Advocacy Alliance. 'Patriot Missile Defense System', (2019).

²⁴⁶Centre for International and Strategic Studies. 'Terminal High Altitude Area Defense (THAAD)', (2021).

According to the U.S. Missile Defense Agency, the U.S. had nine batteries deployed in 2019, five of which were in the Continental U.S., two in the United Arab Emirates, one in Guam, and one in South Korea.²⁴⁷

SAMP/T: Another missile defense system is the Italo- Franco Aster Missile Defense System Surface to Air Missile Platform / Terrain (SAMP/T). It targets aircrafts, UAVs, cruise missiles, and short-range ballistic missiles (with less than 600km in range) and has an interceptor range of 120km by using the Aster 30 missile.²⁴⁸ SAMP/T is a ground-based mobile multi-role air and missile defense system and functions maximally as a theater missile defense system. France and Italy have 10 SAMP/T systems.²⁴⁹ Figure 18 provides an overview on the phases and distances at which GMD, AEGIS and PATRIOT target ballistic missiles.

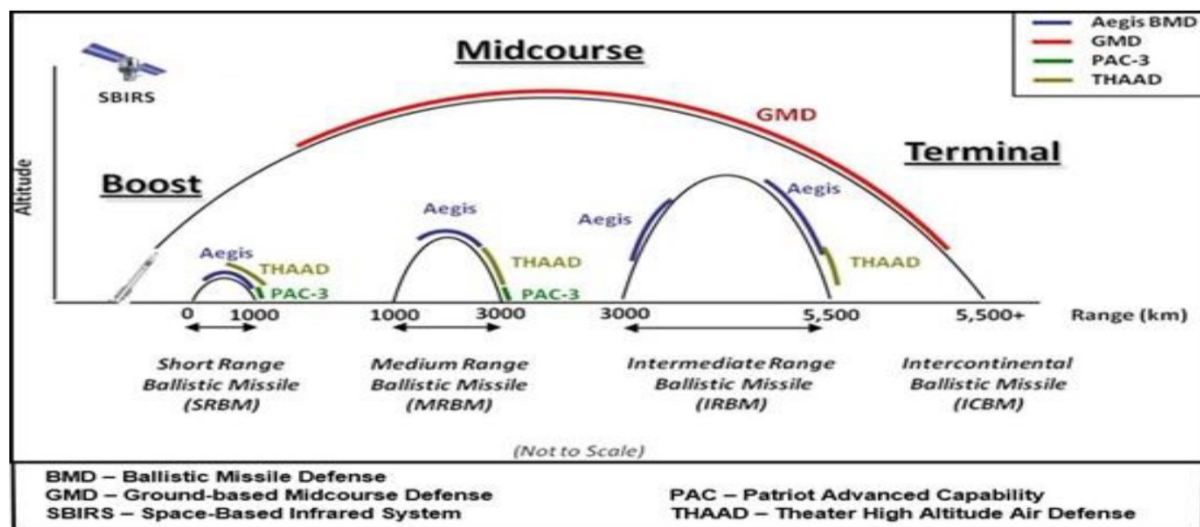


Figure 18. Intercept Possibilities – shows the different interception options for each missile defense system in regard to potential targets.²⁵⁰

²⁴⁷Camilla White. *THAAD and Product Support Overview For the MDA Small Business Conference*, 2009, Accessed August 13, 2021.

²⁴⁸Missile Defense Advocacy Alliance. 'SAMP/T Air Defense System (France & Italy)', (2018).

²⁴⁹Thales Group. 'SAMP-T', Thales, Accessed July 25, 2021.

²⁵⁰Headquarters Department of the Army: *Ground-based Midcourse Defense Operations Figure 1-1 Ballistic missile phases and ranges in ATP3-27.2* (2019).

Sensors. NATO's missile defense framework is based on a broad variety of sensors from long-range installation based, sea based systems, to space based systems.²⁵¹ Some of these system are conncteted via NATO's link 16, a high speed communication link between sensors, command and control systems, and fire units. Figure 19 shows an excerpt of the European theater's sensor coverage, leaving aside the additional coverage from the U.S. and space-based assets which are connected. The mainly southeastern distribution indicates a focus against the threat of Iranian missiles as opposed to the Russian narrative of a Russian-centric NATO missile defense.

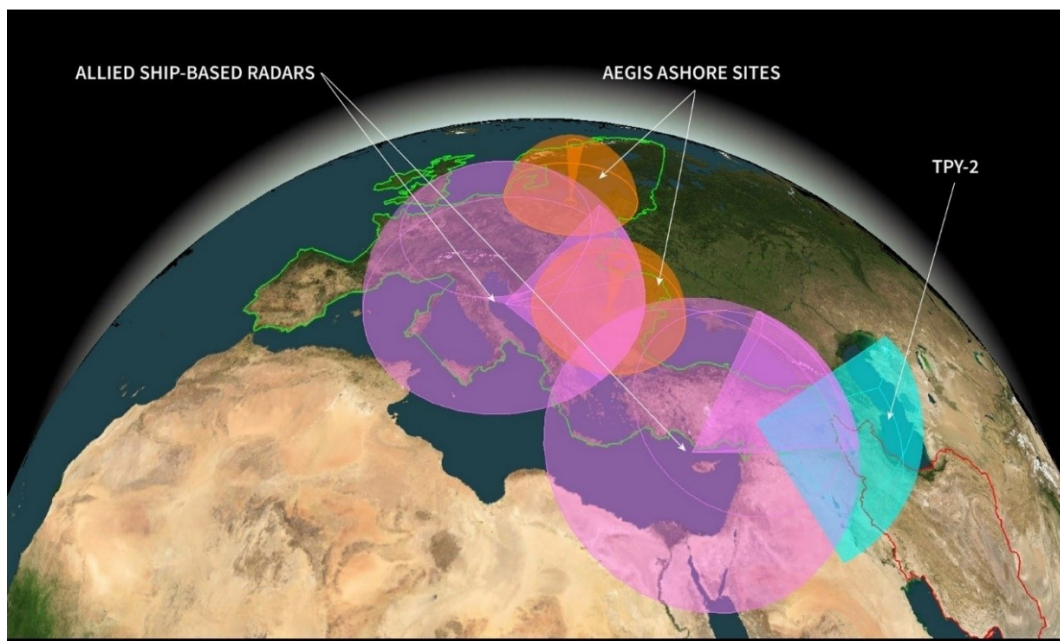


Figure 19. Coverage of NATO's Missile Defense – shows the coverage of NATO's sensor sites showing that there are still uncovered areas in Europe.²⁵²

Besides U.S.'GMD, which aims to supply defense against a limited ballistic missile strike,

²⁵¹Center for Strategic and International Studies, 'AN/TPY-2 Radar', (2021).

²⁵²Williams. 'Achille's Heel: Adding Resilience to NATO's Fragile Missile Shield'.

NATO's missile defense framework comprises mainly of theater missile defense assets with a limited capability against intercontinental ballistic missiles. The ABM capability is provided by AEGIS SM3 block IIa to a limited degree as the number of assets is not able to cover all of the Euro-Atlantic area. The majority of NATO's missile defense assets target short, medium, and intermediate-range ballistic missiles, and have roles in air defense in general.

Russian Capabilities

Russia's missile defense capabilities rely on a layered integrated air defense approach, often using a three-tier layering in which the highest tier is a long-range defense system like the S-300 or S-400 surface to air missile system.

ABM-4/A135. The missile defense system in place around Russia is still in place and regularly being upgraded.²⁵³ Considerations of potential contamination of Moscow by the nuclear warheads used in the system led to the development of conventional warheads for the systems. The ABM-4 system is a silo-based system targeting long-range ICBMs.

S-300. The Russian S-300 is a multivariant surface-to-air missile system. Some variants only target air assets. The S-300V variant is a system similar to PATRIOT PAC2 with a range of 40km in ABM mode targeting short-range ballistic missiles.²⁵⁴

S-400. Another Russian system that is similar to PATRIOT is the S-400, with a range of 60km in ABM mode.²⁵⁵ Russia planned to have 56 to 84 S-400 battalions with four systems each in 2020, organizing them in regiments with 2 to 3 battalions per regiment.²⁵⁶

²⁵³Hans Kristensen and Matt Korda, 'Russian nuclear forces 2020', *Bulletin of the Atomic Scientists* Vol. 76 Issue 2 (2020).

²⁵⁴Centre for International and Strategic Studies. 'S-300', (2021).

²⁵⁵Centre for International and Strategic Studies. 'S-400 Triumph', (2021).

²⁵⁶Dmitry Zenin. 'New regiment of S-400 air defense missile system will enter in service with the Russian army', (2013).

Developments. Russia's newest missile defense system, which potentially will be able to target low flying satellites, is the currently developed S-500.²⁵⁷ One of the systems in development besides the S-500 is the A 235 hypersonic anti-ballistic missile system, likely to be an upgrade to Russia's strategic missile defense efforts.²⁵⁸ A variant of the A 235 system is designed to serve as an anti-satellite weapon system but has no role in missile defense.²⁵⁹ It shows how systems could make a transition and could develop into something that blurs the lines between offensive and defensive systems. But more importantly it further creates new field for missile defense which could be the defense of satellites. The system in general is supposed to serve as a mobile follow-up of A 135.²⁶⁰ It will replace nuclear warhead-based interceptors with kinetic interceptors. Besides backlash for the anti-satellite test, the Russian missile defense upgrade has not received relevant western media coverage or official statements.

Russia's missile defense system is based on the combination of updated strategic missile defense from the Cold War Era protecting Russia's capital with other sites and forces being protected by theater missile defense systems. The approach focuses on protecting essential forces. It is noteworthy that Russian missile defense efforts did not encounter any Western outrage or much coverage by media or official statements at all. The deployment of the S-400 to Syria triggered responses as it supported the Syrian regime. The potential Russian arms deal, selling S-400 to Turkey, also created backlash but more in Turkey's direction as the deal threatened to compromise allied air power by enabling Russian access to sensitive air asset data.

²⁵⁷Centre for International and Strategic Studies. 'S-500 Prometheus', (2021).

²⁵⁸Militarywatchmagazine. 'S-500 or A-235? Russia Tests Advanced New Missile Defence System With Extreme Range', (2019).

²⁵⁹Globalsecurity. '14Ts033 Nudol PL-19 Anti-Satellite', Accessed April 01, 2022.

²⁶⁰Dmitry Litovkin. 'Russia's S-550 missile defense system to intercept warheads free of nuclear blast', (2021).

Comparison

Comparing NATO's missile defense systems to Russia's offensive capabilities shows that neither currently nor in the near future NATO would be able to defend itself against a major nuclear attack by Russia. Russia's strategic arsenal outnumbers NATO interceptors and their capabilities by a large margin. A few hundred missile defense system of which less than 100 are capable to intercept ICBMs face 2,000 strategic nuclear missiles. Additionally, Russia continues to develop new weapon system including systems carrying nuclear warheads.

There are many potential ends for which Russia could develop new exotic weapons, one of which is to have a path to break out from the limitations of New START by creating weapons that are not covered and to increase its deterrence capability.²⁶¹ Russian has taken a step towards nuclear transparency in 2020 by publishing its nuclear doctrine, in which most importantly, Russia states the means to end or limit an escalation as one purpose of its nuclear weapons.²⁶²

Missile defense is at a disadvantage to the attacker when it comes to the cost factor. As an example, the cost comparison of U.S. offensive systems against U.S. defensive systems will be used as the costs for Russian ICBMs were not retrievable at the time of writing this paper. The cost of a Trident II-D5 missile was in 2012, \$70 million USD per piece, which is without a warhead.²⁶³ The cost to purchase a GMD interceptor is \$111 million USD.²⁶⁴ The chance of such an interceptor to hit its target is 57 percent, which means it takes four to hit the target with a 96% chance, pushing the cost to hit the target with a reasonable probability to \$444 million per adversarial ICBM.

This cost disadvantage of the defender could be imbalanced even more by an adversary

²⁶¹Litovkin. Russia's S-550.

²⁶²Petr Topychkanov. 'Russia's nuclear doctrine moves the focus from non-Western threats', (2020).

²⁶³Pentagon cited on Costofwar.com. 'Analysis of the Fiscal Year 2012 Pentagon Spending Request', (2012).

²⁶⁴Kingston Reif and Shannon Bugos. 'New ICBM Interceptor to Cost \$18 Billion', (2021).

using dummy missiles. On top of the acquisition cost comes the cost for operation. David Mosher, published by the Rand Corporation, illustrated this in December 2000:

“The 1970s Safeguard ABM system is a good example. The Army successfully developed and then deployed the system in North Dakota at a cost of \$23 billion (in year 2000 dollars), [...]. The system was fully consistent with the consensus strategic concept of the day and even with the ABM Treaty. And yet it survived only four months before the Department of Defense shut it down because it was too expensive to operate, given what became to be perceived as its marginal contribution to U.S. security.”²⁶⁵

To illustrate: with over 500 strategic launchers for Russia, it would cost the U.S. to likely intercept a first strike (assumed the numbers of interceptor missiles and launchers available) approximately 222 billion USD, which amounts to around thirty-two-percent of the U.S. defense budget in 2019 and leave Russia with another three attempts. The calculations for different intercepts are shown in table 1. Shown are the costs for intercepting one ICBM, 125 ICBM (25% of Russian launchers) and a full-scale attack of all 500 Russian launcher systems.

Table 1. Cost calculation for three different intercept scenarios.

GMD Interceptor Cost	Factor	Cost to Defend
\$111M. USD per Interceptor	4 (for 96% intercept chance)	\$444M per ICBM intercept
\$444M USD per Intercept	x 125 (25% of RUS launchers)	\$55.5B per partial (25%) salvo
\$444M USD per Intercept	x 500 (100% of RUS launchers)	\$222B per full scale salvo

The calculation for an attack is shown in table 2.

²⁶⁵David Mosher, 'Understanding the Extraordinary Cost of Missile Defense', *Arms Control Today* (April 2000).

Table 2. Cost calculation for three different attack scenarios.

Cost per ICBM (US)	Factor	Cost to Attack
\$70M. USD	1	\$70M. USD
\$70M USD	x 125 launchers	\$8.5B. USD per partial (25%) salvo
\$70M USD	x 500 launchers	\$35B. USD per full scale salvo

The calculation shows that the defender is at cost disadvantage compared to the attacker by a factor of six. This shows the immense disadvantage at which the defender operates concerning costs. It also shows that full scale missile defense with existing systems is close to impossible given limited military budgets. While scaling effects for large scale missile defense production need to be considered, the attacker can stabilize the calculated advantage by using the above describes methods like deploying dummy missiles. It further shows that Russian strategic capabilities were never threatened even if a significant number of GMD interceptor had been stationed in Europe.

Damage mitigation through ballistic missile defense, at least missile interceptor based is only sustainable against limited strikes. Moreover, even against limited strikes, it appears to be exceedingly hard to set up a good defense as the area to be defended is immensely large (Euro-Atlantic area). This indicates that in the near future a missile defense system that provides protection against large scale strikes for the Euro-Atlantic area is very unlikely.

When it comes to communication, Russia continues to develop its missile defense assets without any negative communication from the West. But it is Western missile defense that faces regular Russian outrage, media coverage as well as official communication condemning the “Western aggression”. Russia’s missile defense on strategic level received throughout the last

twenty years only media coverage in engineering or already military related articles.²⁶⁶ Coverage on missile defense in general was intensified when Russia deployed its S-400 system to Syria and even then coverage remained relatively neutral.²⁶⁷ At the same time Russian communicated reservations towards Western missile defense is supplemented by its state owned media outlets, facilitating propaganda.

Future Developments

Besides the technological enhancement of the existing missile defense system capabilities, various developments are ongoing to outpace the developments in missile technologies or at least keep up with them. Some research projects try to reduce the advantage that an attacker has over the defender by pushing the intercept closer to the origin of a missile. Boost phase intercepts with missile interceptors are difficult as the interceptor's launcher is often far away which makes having a flight time is short enough to hit a target in the boost phase unlikely.²⁶⁸

However, the current development of air-borne energy beam-based systems and space-based systems has the potential to reduce the disadvantage. Due to system cost and energy requirements to achieve a missile kill, it seems unlikely that there will be a serious reduction as the development of offensive capabilities and evasion systems is also ongoing, as was shown in the example of Russia's offensive nuclear developments. Hypersonic weapons or speed increase in general is another already ongoing development that could diminish the capability of existing,

²⁶⁶Compare to Hendrickx, Bart, Aerostat: a Russian long-range anti-ballistic missile system with possible counterspace capabilities, (2021).

²⁶⁷Compare to Jonathan, Marcus, Russia S-400 Syria missile deployment sends robust signal, *BBC*, December 1, 2015.

²⁶⁸Karako, Williams, and Rumbaugh, *Missile Defense 2020 April 2017 Next Steps for Defending the Homeland*, 112.

and currently developed missile defense systems. The faster a missile is, the shorter is the window of opportunity to intercept it.

SUMMARY/ CONCLUSION/RECOMMENDATION/FURTHER RESEARCH OPPORTUNITY

Summary

The strategic level impact of missile defense systems on the NATO – Russian relationship is based on two aspects. The technological aspect and a perception aspect. The technological aspect is the objective influence, by providing intercept capability. The perception aspect is how missile defense development and deployment as well as potential future developments are seen by an adversary.

As far as existing systems go, the technological aspect has had a minor influence as no system could degrade the offensive nuclear capability of the other party to the extent where it can decisively change the outcome of an attack. Destabilizing effects could neither be seen in the historical view nor in current developments. The reason for this lies in the cost-effectiveness, the capabilities that systems offer and in their existing numbers. While complete missile defense could be possible, it would consume a nation's defense budget without guaranteeing that a minor technological development could outpace the existing, expensive system. The attacker has a significant advantage over the defender.

Missile defense unfolds most of its perception impact through the prospect of possible future developments. The adversarial fear is that missile defense could break the threshold from being a strategic territorial defense system with limited impact to the point where more advanced systems could defeat offensive capabilities completely. A destabilization could be possible during the crossing from limited to complete missile defense. A potential arms race could result, due to an adversary's attempts to outpace significant missile defense developments.

Developments that could fully defeat offensive capabilities, however, still seem far away. The concept of space-based energy systems over enemy territory seem to have the development potential to enable such a crossing. It would enable the defender to conduct an early intercept, but a lot of technological barriers have to fall to acquire such an advanced technology.

Historical and current developments never reached such a tipping point. During the Cold War, missile defense was a stabilizing influence factor to East-West relations. The immense nuclear arsenals on both sides made it impossible to degrade the offensive capabilities with missile defense. The prospect of potential technological breakthroughs in missile defense, led the Soviet Union to include missile defense in arms control negotiations and to modernize offensive nuclear capabilities. Even though there was Soviet investment in strategic arms due to the fear of losing offensive capabilities, missile defense proved to be an easy entry point for negotiation. In the end complete defense proved to be much too expensive. It is important to note that none of the historical developments were driven by any single factor such as missile defense, as a multitude of various factors drives international relations. Missile defense may not have ended the Cold War, but developments created a further element of insecurity on the Russian side, as well as a negotiation point.

The current developments show missile defense was used in the Russian narrative as an allegedly destabilizing factor only after the relationship had already deteriorated. It is used to discredit the West as an aggressor when it was Russia that did not take up the Western offers of cooperation in missile defense. Any suggestion that Western missile defense is an aggression towards Russia is not true. NATO's missile defense neither was nor in the near to mid-term future will be a threat to Russia's offensive capabilities. Russia uses Western missile defense in its communication efforts, supporting its narrative of being a victim of Western aggression, and

thus legitimized to act accordingly which is false and a deception technique to cause friction within the alliance.

The argument could be made that Western missile defense, especially theater missile defense, could degrade the Russian concept of limited nuclear escalation. It could force Russia to use extensive sub-strategic weapons, which puts Russia in the dilemma of considering successful penetration by too many weapons leading not only to an immensely strong signal but also potential escalation. But if applied in full scale the Russian argument let's other defensive systems appear to be aggressive. Civilian damage mitigation measures, fallout shelters and other efforts could be named aggressive, due to a potentially diminishing effect they could have on adversarial weapon systems. To follow such arguments would severely limit options against a potential adversary that considers the use of tactical nuclear weapons an option to de-escalate (win) a limited/ regional conflict. It would be to fall for propaganda.

As there is no evidence for a direct missile defense-based destabilizing impact on the East-West relationship, the necessity of major arms control limiting a nation's defensive capability cannot be deducted. The initial thesis does not stand through thorough analysis. Missile defense, however, could again become an object of future negotiations when it comes to further reductions of nuclear weapons. With lower limits on nuclear weapons, the impact of missile defense on adversarial offensive capabilities increases.

Missile defense is one factor among many influential factors in the deterioration of NATO – Russian relationship. Limiting NATO's capacity with legally binding documents will only serve rogue regimes as they would have a limited number of interceptors to overcome to be a credible threat.

Recommendations

First: the continuation of diplomatic exchanges with Russia must stop until Russia removes its military forces from Ukraine. It is essential to reduce tension and develop options for a de-escalation of the current situation. Russia must stop its violation of international law. The Obama reset attempt should serve as an example that any appeasement towards Russia will be exploited. Russia again violated international law by breaking the Minks Accord in February 2022 and invading Ukraine.

Second: Missile defense systems should not be part of restricting arms control treaties. The identified stabilizing character of missile defense in the relationship between peer/near-peer competitors needs to be maintained in an already tense environment. The ability of missile defense to create a doubt that a nuclear first strike would eradicate all adversarial nuclear assets increases the deterrence potential of the West. At the same time missile defense denies smaller rogue states the ability to conduct successful ballistic missile attacks, contributing further to stability through deterrence by denial.

Third: NATO must abstain from unilateral arms reduction, especially for missile defense. The idea that unilateral arms reduction would lead to other nations following suit is disproven²⁶⁹. This concept also translates to unilateral arms reduction in the case of Russia. In missile defense, Russia has a deployed anti-ballistic missile defense system that repeatedly had violated the ABM treaty while the treaty was still in place. At first, in 2001, Russia stated that the U.S. departure from the ABM treaty was a mistake but no threat to its security. Only after Russia had developed into an aggressor in Europe did it change its narrative on missile defense. Unilateral reductions in missile defense would create a dangerous impression of NATO having no endurance in

²⁶⁹Jeffrey Knopf, 'Nuclear Disarmament and Nonproliferation: Examining the Linkage Argument', *International Security* Vol. 37 No. 3 (Winter 2012/13) 132.

international tensions, thus inviting other nations to create or keep tensions high in the hope of gaining against NATO.

Especially in the current crisis NATO could lose significant credibility by creating outcomes that could be perceived as detrimental to Ukraine or the eastern NATO partners. Additionally, missile defense technology plays an essential part in alliance cohesion and defense against limited strikes. It denies rogue regimes opportunities to threaten Western civilization.

NATO, therefore should continue to coordinate and facilitate technological developments to keep up with offensive developments. Weapons that are currently cutting-edge technology of peer or near-peer competitors will proliferate to rogue nations or potentially be designed by them after the existing examples. It is, therefore, necessary to press on with developments in missile defense to be prepared for strikes with weapons that today are called exotic developments. Common development efforts and shared burdens in missile defense are also a measure of strengthening alliance trust, increasing NATO's deterrence potential by signaling a united effort.

Further Research

The presented work is predominantly based on document research. Supplementation by more quantitative factors could be helpful to support the deducted findings. The quantitative factors that could be analyzed are the impact of missile defense developments on adversarial military budgets, conventional forces and numbers of non/sub-strategic nuclear warheads, and their launcher systems.

The deductions in this work are limited to peer- or near-peer competitors, comparison with findings in the analysis of non-peer competitors, would help broaden the understanding of missile defense's impact on international relations.

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**APPENDIX: NUMBER OF U.S. AND USSR/RUSSIAN STRATEGIC LAUNCHER
SYSTEM AND NUCLEAR WARHEADS 1945 TO 2019**

Year	Launcher ²⁷⁰		Nuclear Warheads ²⁷¹	
	US	Russia	US	Russia
1945	15	0	6	0
1946	125	0	11	0
1947	270	0	31	0
1948	473	0	100	0
1949	447	0	200	0
1950	462	0	330	0
1951	569	0	500	0
1952	660	0	720	0
1953	720	0	878	0
1954	1035	0	1418	0
1955	1260	0	1755	0
1956	1470	40	2123	120
1957	1605	53	2460	152
1958	1620	91	2610	256
1959	1551	138	2496	343
1960	1559	153	3127	386
1961	1532	200	3153	449
1962	1653	246	3451	497
1963	1812	321	4050	608
1964	2012	436	4718	782
1965	1888	519	5055	885
1966	2139	653	5744	1037
1967	2267	1064	6226	1466
1968	2191	1314	6117	1713
1969	2109	1652	5882	2036
1970	2100	1946	6135	2327
1971	2087	2083	7140	2469
1972	2167	2164	8609	2550
1973	2133	2214	9732	2681
1974	2106	2203	10195	2843
1975	2106	2397	10666	3565
1976	2092	2489	11098	4005
1977	2092	2462	11194	4518
1978	2086	2410	11351	5517
1979	2086	2545	11088	6700

²⁷⁰Norris and Cochran, *Nuclear Weapons Data Book*.

²⁷¹Norris and Cochran, *Nuclear Weapons Data Book*.

Annex continued.

Year	Launcher		Nuclear Warheads	
	US	Russia	US	Russia
1980	2022	2485	10768	7488
1981	1942	2563	10464	8142
1982	1897	2545	10291	8716
1983	1881	2513	10610	9242
1984	1909	2495	11308	9553
1985	1917	2511	11590	9997
1986	1933	2478	12314	10212
1987	2001	2535	13685	10628
1988	1926	2523	13080	11076
1989	1903	2488	12780	11540
1990	1875	2414	12304	11252
1991	1239	1938	9300	10164
1992	1196	1690	8280	9609
1993	1045	1531	7528	8938
1994	1097	1387	7778	8032
1995	1081	1324	7323	7379
1996	1085	1308	7147	7259
1997	1085	1174	7147	5972
1998 ²⁷²	1024	1174	7206	5972
1999	1039	1174	7206	5972
2000	1055	1173	7206	5906
2001	1097	1186	7206	6018
2002	1097	1016	6480	4951
2003	1039	991	6140	4852
2004	1004	923	5886	4422
2005	961	855	4216	3814
2006	951	819	5021	3503
2007	921	748	4298	3339
2008	891	685	3575	3113
2009	851	620	2202	2787
2010	824	566	2085	2504
2011	798	531	1968	2427
2012	798	538	1952	2435
2013	798	558	1952	2484
2014	798	536	1922	2305
2015	798	543	1902	2531

²⁷² From 1998 on, data points from: Federation of American Scientists, “Nuclear Notebook,” FAS Nuclear Notebook, Accessed January 2022, <https://fas.org/issues/nuclear-weapons/nuclear-notebook/>.

Annex continued.

Year	Launchers		Nuclear Warheads	
	US	Russia	US	Russia
2016	788	553	1892	2606
2017	708	560	2328	2460
2018	700	562	2270	2522
2019	700	546	2205	2671