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COOPERATION IN THE FIELD OF MISSILE DEFENSE IN THE EURO-ATLANTIC AREA

An important feature of contemporary armed conflicts is the large-scale use of air attack. The events of the last two years have made many experts realize that the present air safety environment is increasingly uncertain, complex, and difficult to forecast. It is therefore justified to present current issues related to anti-missile defense – which, in the authors' opinion, is crucial for the functioning of NATO border states.

The aim of this article is to describe cooperation in the framework of anti-missile defense in the Euro-Atlantic area, which is characterized by a dynamic process of transformation, including ambitions among some countries to dominate in this dimension.

This study uses document research and quantitative and qualitative analysis. It reviews the scientific literature on the complex issue of cooperation in the field of missile defense, and uses publicly available information provided by interested institutions. The results show that this cooperation is not a new phenomenon, but it currently requires organized political and military actions from states, including their armed forces.

Keywords: air safety, air threats, missile defence.

1. INTRODUCTION

The contemporary air safety environment is characterized by a dynamic process of transformation of types of threats, which include, among others: ambitions of some countries to dominate in this dimension. In considerations regarding counteracting threats to state security in the air dimension, it is necessary to refer to similar efforts undertaken by the international community in the Euro-Atlantic area. In the case of Poland and Romania, cooperation within the North Atlantic Alliance is particularly important, as it is reflected in the functioning and development of the NATO Integrated Air and Missile Defense System – NATINAMDS.

An important element of ensuring the air security of Poland and Romania is cooperation in the field of air defense implemented within the European Union (EU) within the framework of institutionalized PESCO cooperation (*Permanent Structured Cooperation*).

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Finally, in considerations regarding counteracting threats to the air security of Poland (Romania), it seems necessary to take into account the international cooperation developing in various dimensions and formats in the Euro-Atlantic area in the field of anti-missile defense.

To better understand the implications of cooperation in the field of air defense in the Euro-Atlantic area for the air security of Poland (Romania), it is necessary to refer in more detail to the scope of cooperation, division of responsibilities and limitations to which such cooperation will be subject. The statements dominating in the public space that the North Atlantic Alliance will defend Poland (Romania) and the European Union will provide money are an oversimplification and do not reflect the actual implications of Poland's (Romania's) participation in NATINAMDS and PESCO or the anti-missile shield for the air security of our countries (Permanent Structured Cooperation, 2021; Terlikowski, 2018).

In recent years, the threat structure of our countries has changed significantly. Many new military threats have emerged and may develop into long-term crises or high-intensity armed conflicts. This assessment is confirmed by the events in Ukraine, i.e. Russia's aggression in 2022 and its consequences. In the authors' opinion, in this context, air defense (AD) of the territory as a border state of the North Atlantic Alliance and the European Union becomes particularly important for the security of Poland (Romania). Therefore, it is necessary to take into account the broader context of international cooperation in the Euro-Atlantic area to shape Poland's (Romania's) capabilities in ensuring air safety. In a narrower sense, this cooperation should be considered through the prism of increasing the ability to counteract threats to the state's air security.

Taking into account the issues discussed and due to the importance of air defense for the security of Poland (Romania), the authors in this article attempted to analyze and assess the political and military conditions of its functioning through the prism of cooperation in the Euro-Atlantic area as part of the construction of an anti-missile shield.

2. EVOLUTION OF THE ANTI-MISSILE DEFENSE CONCEPT

On May 12, 2016, i.e. on the seventeenth anniversary of Poland's accession to the North Atlantic Alliance, NATO Secretary General Jens Stoltenberg stated: "Our missile defense program represents a long-term investment against a long-term threat. Our goal is to achieve full coverage and protect NATO's European allies from ballistic missile attacks from outside the Euro-Atlantic area" (North Atlantic Treaty Organization, 2022). It can be said that these words are the culmination of many years of efforts, the consequence of which is the NATO BMD (*Ballistic Missile Defense*) anti-missile defense system and the American EPAA (*European Phased Adaptive Approach*) program. This event was the result of many years of discussions and work, the beginnings of which can be traced back to World War II.

Anti-missile defense can be defined in one sentence as: all projects and measures used to protect the population, territory and troops against all threats related to the use of missiles (AAP-6, 2017). Thus, anti-missile defense is a part of air defense focusing on repelling the enemy's air strike and destroying its air attack means (ABM), especially ballistic missiles and strategic aviation (Poland in the American missile defense system, 2008). Anti-missile defense can fulfill a number of functions, including strengthening the state security system and increasing the credibility of deterrence. Without going into the complex issue of classifying ballistic missiles, for the purposes of this study the classification by range is important because it corresponds to the division of anti-missile systems. Thus, ballistic

missiles are divided into four groups: 1) Short-Range Ballistic Missile (SRBM): range up to 1,000 kilometers (this group of missiles often includes battlefield missiles (*Battlefield Short-Range Ballistic Missile* – BSRBM) with a range of up to 150 km), 2) Medium-Range Ballistic Missile (MRBM): range from 1,000 to 3,000 kilometers, 3) long-range missiles intermediate (*Intermediate-Range Ballistic Missile* – IRBM): range from 3,000 to 5,500 kilometers, 4) intercontinental ballistic missile (ICBM): range over 5,500 kilometers (Carter, Schwartz, 1984).

The above division also serves to divide anti-missile systems intended to combat short-, medium- and intermediate-range missiles, respectively, and against intercontinental missiles. Reorientations in the approach of individual countries to the concept of missile defense can be broadly divided into two periods. The first covers the time from the end of World War II to the collapse of the USSR. The second one, in turn, is part of the period from the collapse of the USSR and the bipolar division of the world to modern times, which are characterized by a multipolar division of the world and conflicts in the Middle East and Ukraine.

It is worth emphasizing that the issue of ballistic missiles and their countermeasures, in the first period, was part of the broadly understood conflict between the USSR and the United States. It practically began when the Soviet Union, on August 29, 1949, carried out its first atomic weapon test. However, specific initiatives took place only after the USSR launched the R-7 rocket in August 1957, which two months later carried the first Soviet satellite – *Sputnik* – into Earth orbit. Until then, the superpowers focused only on developing air defense programs, because the main threat carrier was strategic aviation. However, since 1957, the problem of missile threats and anti-missile defense against intercontinental ICBMs has arisen (Roslan, 1985). Given the fact that Soviet ballistic missiles became the primary means of delivering nuclear warheads, the United States faced the challenge of building an effective Missile Defense (MD). Currently, this system consists of three basic subsystems: detection and guidance (radars and satellites), interception (interceptor missiles, laser), command and communications. Currently, to combat ballistic missiles, in individual phases of their flight and depending on their range, it is necessary to use various technical solutions, very often referred to as layered (multi-layer) anti-missile defense. This necessitates the use of various missile interception subsystems, which are deployed on land, creating an interception system in the initial phase, a defense system in the mid-flight phase, theater anti-missile defense systems, i.e. in the final phase of flight (PAC-3, MEADS, THAAD), and also at sea as the *Aegis* system and in the air based on the Boeing 747 aircraft.

It is worth emphasizing that not only the USA devoted its time to developing them. The Soviet Union also developed its anti-missile systems. There was a belief that anti-missile weapons could provide a specific advantage, because a country with effective defense would be able to launch a pre-emptive attack and would gain an advantage in inflicting retaliatory blows (Poland in the American missile defense system, 2008). During this period of competition, the *Star Wars* program announced by US President Ronald Reagan in the 1980s was important for modifying the concept of anti-missile defense. It not only contributed to laying the foundations for modern American missile defense, but also began an extremely dynamic period of technology development in this field.

3. POLISH APPROACH TO NEW CHALLENGES

The collapse of the Soviet Union ushered in a new international order, causing a far-reaching evolution of the security environment. The collapse of the bipolar world contributed to the emergence of the so-called asymmetric threats. The interpretation of these threats, which are part of the issues discussed, may be, for example, a terrorist attack using atomic, biological or chemical weapons, where the carrier will be missiles. This is facilitated by the dynamic proliferation of nuclear and missile technology to countries contesting the order in their regional environment. These events necessitated the evolution of the American missile defense concept. Therefore, the issue of the anti-missile shield did not disappear with the end of the Cold War rhetoric. This was reflected in the announcement by US President G. Bush of the shield initiative, which was initially intended to cover only the United States and, as a consequence, was extended to its *allies and friends* (Poland in the American missile defense system, 2008).

From the Polish point of view, an important element in the development of the American missile defense concept were consultations on the deployment of its elements on Polish territory, which had been conducted since 2002. During the tests, various factors determining the arrangement of selected elements of this system were assessed. Consequently, of all the locations, the military complex in Redzikowo turned out to be the best of all the options considered. Polish-American consultations ended with the signing on August 20, 2008 of the Agreement between the Government of the Republic of Poland and the Government of the United States on the deployment of anti-ballistic defense interceptors on the territory of the Republic of Poland. It assumed the deployment of ten GBI interceptor missiles in Poland³. Initially, the operation of the base in Redzikowo was to be supported by a radar station located in the Czech Republic. Also initially, the American version of the anti-missile shield, proposed by George W. Bush, assumed stationing only long-range anti-missiles in Poland. It was, however, thoroughly modified by the next American administration (National anti-missile system, 2012).

The next significant stage for Poland on the path to creating a coherent anti-missile defense system is set on September 17, 2009, when the President of the United States, Obama, changed the concept of the architecture of the American anti-missile defense system in Europe. At the same time, it was agreed that the new allied system would be built based on the American missile defense installations being built in Europe. This was reflected in decisions defining the assumptions for the staged development of these capabilities (EPAA). Pursuant to these provisions, first of all, capabilities are provided to defend against short- and medium-range missiles, and then also intermediate-range ones. At the same time, thanks to the extensive use of mobile systems in the architecture, it is to be adaptive to newly emerging threats.

The EPAA project is being implemented in three phases, gradually increasing the range of Europe's defense against ballistic missiles from the Middle East (Information material, 2015). And so, the first phase ended in December 2011. As a result, *Aegis*-class ships equipped with SM-3 IA anti-missiles were deployed in the Mediterranean Sea and the AN-TPY-2 mobile radar was deployed in Turkey. The aim of this phase was to provide point defense of critical infrastructure and troops in Southeastern Europe against short-

³ GBI – *Ground Based Interceptor*. GBI is a three-stage anti-ballistic missile designed to operate as part of a ground-based anti-ballistic defense system in the mid-flight phase; it is complemented by the ground part of the American Missile Defense anti-ballistic system (*Ground-Based Midcourse Defense* – GMD).

and medium-range ballistic missiles. The second phase, which was initially scheduled to end in 2015, involved the deployment of sea-based and ground-based SM-3 IB anti-missiles at the Deveselu base in Romania (so-called *Aegis Ashore*). It also resulted in the deployment of advanced radar systems, ensuring the defense of larger areas of Europe against short- and medium-range missiles. The last, third phase includes the deployment of land-based SM-3 IIA anti-missiles in Poland and Romania and at sea, capable of defending the entire European NATO territory against short- and medium-range missiles and, to a limited extent, intermediate-range missiles.

To sum up, as a consequence of the arrangements between the US and NATO, the American contribution to the European anti-missile system is the project of a multi-layer EPAA system, within which an anti-missile launcher will be located on Polish territory. It should be emphasized that the American system will not be a closed system, but will be successively modernized along with the ongoing development of technology. In turn, the multi-layer nature of the new anti-missile system means that enemy missiles can be combated in various phases of flight, even right after take-off – although in this case only using the most technologically advanced systems.

It is worth mentioning once again that the current American concept of the anti-missile shield is based on the so-called multi-layer defense of a tactical, operational and strategic nature, which is to be created by four subsystems. The first is a laser subsystem, which is planned to be installed on board special aircraft performing patrol flights in the most sensitive regions of the world. The task of this subsystem will be to try to destroy the enemy missile at the most convenient moment – right after its launch, in the so-called ascent phase. Another is the *Aegis* anti-missile subsystem deployed on warships, equipped with SM-3 (*Standard Missile-3*) missiles, intended to detect and destroy ballistic missiles, especially in their initial phase of flight. The next element is the *Patriot*-type land-based anti-aircraft and anti-missile defense subsystem, or more precisely, its latest generation – PAC-3. The task of this link, commonly referred to as *the last-chance defense measure*, is to destroy ballistic missile warheads in their last, final phase of flight. The last one is the land-based element of the anti-missile defense subsystem intended to combat enemy ballistic missiles in their mid-flight phase using the so-called kinetic interceptors (Orłowski, Bil, 2007).

From the Polish point of view, the last of the above-mentioned components of the anti-missile shield is of particular importance – the mid-flight, land-based anti-missile defense system, the essential part of which are land-based interceptor missile launchers. It is the elements of this system that will be deployed on the territory of the Republic of Poland.

4. GERMAN POINT OF VIEW

From the perspective of the discussion on the Polish air defense system (anti-aircraft and anti-missile), it is also necessary to mention the importance of the same system for the German Armed Forces (Gotkowska, 2018). The modernization of the German air defense system is perceived as important for conducting missions outside the NATO treaty area, defending the territory of allies and for Germany's political-military and military-technical position in the Alliance⁴. At the same time, there may be a different opinion that the mentioned modernization may influence the choices of other NATO member states (Gotkowska, 2013). Thus, both the assumptions of the current reform and the direction of

⁴ TLVS (*Taktisches Luftverteidigungssystem*) is a German program for the modernization of medium-range anti-aircraft and anti-missile defense.

the evolution of German security policy will influence Germany's approach to political and military cooperation within NATO and the EU.

In 2011, between the Georgian-Russian war and the occupation of Crimea and the Ukrainian crisis, the reform of the Bundeswehr began, the aim of which was to *re-construct* the German armed forces in the political, military and social dimensions (Gotkowska, 2012). In the political dimension, the role, goals and principles of its use were redefined. Thus, it was determined that the new Bundeswehr would be an instrument to support and protect German interests in the world. In the military dimension, the goal of the Bundeswehr reform is to create a smaller but more effective army, well trained and equipped with modern equipment (Gotkowska, 2012).

The assumptions of the reform of the German Armed Forces and the directions of transformation of German security policy fit into the examined issues, therefore, in the authors' opinion, it is worth getting acquainted with its general assumptions. Thus, politically, the Bundeswehr is moving away from the expeditionary capabilities of the army developed after the end of the Cold War and the slow increase in Germany's participation in NATO, EU and UN operations in favor of tightening military cooperation within the Alliance and the European Union. At the same time, fearing excessive dependence on its most important European partners (France and Great Britain), Germany wants to maintain its independence. Therefore, according to the new assumptions, German politicians and military officials will only engage in cooperation projects that do not limit the possibility of autonomous and flexible action and generate military and political benefits in selected areas⁵.

In the field of missile defense, the Bundeswehr is developing capabilities in two areas. Firstly, in the context of protecting German military bases during foreign missions. The MANTIS⁶ anti-missile, anti-artillery and anti-mortar system is to be used for this purpose (the Bundeswehr has ordered four such systems). Secondly, Germany participates in the NATO anti-missile defense program ALTBMD (*Active Multi-Layer Theater Ballistic Missile Defense*), which is designed to protect NATO troops during operations against ballistic missiles with a range of up to 3,000 km and which is part of the NATO system NATO BMD missile defense. After the reform, the German contribution to ALTBMD will probably be fourteen batteries of the *Patriot* short-range missile defense system, modernized to the PAC-3 version, and the SAMOC mobile surface-to-air missile operations center⁷.

As a result, Germany, which declared in 2015 that it would purchase MEADS instead of Patriots, saved the program. The Bundeswehr decided to use the results of the MEADS program to build a German medium-range anti-aircraft and anti-missile defense system in cooperation with France and possibly Italy. This system is intended to provide the Bundeswehr with protection against short-range ballistic missiles (up to 1,000 km). At the same time, it is planned to become part of the NATO anti-missile defense system, just like the German Patriot systems. This is to be an introduction to increasing Germany's participation in the NATO anti-missile defense system and an announcement of the

⁵ In the context of the economic crisis and defence savings in the EU, Germany's goal is, among others, maintaining production capabilities and guaranteeing the technological development of German arms companies.

⁶ MANTIS – short-range defense system from Rheinmetall.

⁷ The SAMOC system is a mobile command and control facility dedicated to the air defence brigade level.

possible acquisition or development of defense systems against medium, intermediate and long-range ballistic missiles (up to 3,000 km, 5,500 km and above). However, the decisions depended on many political, military and financial factors.

To sum up, taking into account the issues discussed and the challenges faced by the Polish air defense system, it is worth emphasizing that the German systems currently used and planned are *Patriot* sets (and their possible successors), which are to become part of the NATO anti-missile defense system. At the same time, the Alliance agreed that the NATO ALTBMD program, in which Germany has been participating since 2005, together with American missile defense installations in Europe (EPAA), is to be included in the NATO system.

5. NEW CHALLENGES

An important topic, which can also be treated as a separate study, is the integrated air and missile defense system of the US Army, i.e. the United States Army – *Integrated Air and Missile Defense* (AIAMD). The United States Army's AIAMD program is intended to enable the integration of various AMD (*Air and Missile Defense*) air and missile defense systems into one system. Its most important element is to be the network-centric command and control system IBCS⁸, the main contractor of which is Northrop Grumman. The philosophy of this system is to connect separate elements via the IFCN (*Integrated Fire Control Network*) network, including: *Patriot* system radar stations, *Patriot* system missile launchers, as well as modified *Sentinel* radar stations. In the future, this system will also provide the ability to command and control elements of the THAAD anti-missile defense system and the newly created short-range anti-missile system IFPC Inc 2-I (*Indirect Fire Protection Capability Increment 2-Intercept*). Moreover, the network-centric IBCS air defense command and control system is also to have the ability to communicate with other command and reconnaissance systems (Delay AIAMD, 2021).

This issue is interesting because the Polish Ministry of National Defense became interested in the command post of the IBCS air defense command and control system in 2017, carrying out work as part of the *Wisła* program (Maciejewski, 2017). Unfortunately, trying to characterize the IBCS system is difficult because it is a product that is still in the design phase and there is no model set. Also, the technical future of the IBCS air defense command and control system is still uncertain. However, it is worth noting, from the point of view of the topic discussed, that anti-aircraft and anti-missile defense systems are integrated at all possible levels as part of the general air defense system. Thus, this reflects the American approach to consolidating systems that will jointly ensure in the future the implementation of the concept of multi-layer anti-aircraft and anti-missile defense of all protected elements, starting from the state's critical infrastructure and ending with the protection of troops operating outside the country's territory (in the crisis area).

A noteworthy example illustrating the tightening of cooperation between the United States and the Alliance in the area of developing anti-missile defense capabilities is also the construction of the territorial anti-missile defense system (NATO BMD), in which the assumptions regarding the evolutionary development of the system and its adaptability to emerging threats are consistent with those presented for EPAA. This is primarily due to the basing of NATO BMD on the architecture of the EPAA system.

⁸ IBCS – *IAMD Battle Command System* – network-centric air defence command and control system.

6. CONCLUSION

To sum up, the development of a Polish or Romanian air defense system, compatible with the capabilities of allied and American systems, will significantly strengthen the defense of Poland (Romania) against a wide spectrum of air (missile) threats. Thus, the Polish (Romanian) armed forces will be able to detect, recognize and combat short-, short- and medium-range missiles in their final phase of flight, as well as other means of air attack (planes, helicopters). In turn, defense against long-range ballistic missiles would be the task of the American and allied systems.

An interesting summary may also be the words of Peter Flora, former NATO Deputy Secretary General for Defense Investments, who said:

NATO's greatest strength is the power of its unity. Community of commitment and community of action. That is why we support a Community approach that leaves no nation behind, equips NATO with a missile defense shield to protect all its inhabitants, and provides the highest degree of confidence that any missile threat, whether from hostile countries or terrorists, will be defeated.

REFERENCES

- AAP-6 Słownik terminów i definicji NATO* (2017). Agencja Standaryzacyjna NATO. Wojskowe Centrum Normalizacji, Jakości i Kodyfikacji.
- Carter, A.B., Schwartz, D.N. (1984). *Ballistic missile defens.* Washington D.C.: Brookings Institution.
- Delay AIAMD – effects on the Wisła program* [Access: 22.12.2021]. Dziennik Zbrojny. Access on the internet: <http://dziennikzbrojny.pl/aktualnosci/news,3,10580,aktualnosci-ze-swiatea,opoznienie-aiamd-skutki-dla-programu-wisla>.
- Gotkowska, J. (2012). *Bundeswehra 3.0. Polityczny, wojskowy i społeczny wymiar reformy Sił Zbrojnych RFN*. Punkt widzenia nr 28. Warszawa: Ośrodek Studiów Wschodnich.
- (2013). *Obrona powietrzna RFN – problemy i perspektywy rozwoju*, Komentarze Ośrodka Studiów Wschodnich nr 105 z 10.04.2013. Warszawa: Ośrodek Studiów Wschodnich.
- (2018). *Odbudowa obrony powietrznej Niemiec: w przededniu kluczowych decyzji* [Access: 5.10.2022]. Ośrodek Studiów Wschodnich, Komentarze nr 268 z 17.05.2018. Access on the internet: https://www.osw.waw.pl/sites/default/files/komentarze_268.pdf.
- Information material on the construction of the American anti-missile defense system base in Redzikowo* (2015). Departament Polityki Bezpieczeństwa Międzynarodowego. Warszawa: Ministerstwo Obrony Narodowej.
- Maciejewski, A. (2017). *IAMD & IBCS – przyszły zintegrowany system obrony powietrznej US Army*. „Wojsko i Technika”, nr 7.
- National anti-missile system – preliminary assumptions* (2012). „Biuletyn Wydziału Analiz Rządowego Centrum Bezpieczeństwa”, nr 1, październik–grudzień.
- North Atlantic Treaty Organization* [Access: 5.10.2022]. Access on the internet: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2016_07/20160630_1607-factsheet-bmd-en.pdf.
- Orłowski, T., Bil, I. (2007). *Amerykański projekt systemu obrony przeciwrakietowej (Missile Defense). Implikacje dla Polski*. Warszawa: Fundacja Aleksandra Kwaśniewskiego.
- Permanent Structured Cooperation – PESCO* [Access: 3.06.2021]. Access on the internet: https://eeas.europa.eu/headquarters/headquarters-Homepage/34226/permanent-structured-cooperation-pesco-factsheet_en.

- Poland in the American missile defense system* (2008). "Biblioteka Bezpieczeństwa Narodowego", kwartalnik wydawany przez Biuro Bezpieczeństwa Narodowego, t. 1. Warszawa.
- Roslan, G. (2005). *Rola potencjału jądrowego w kształtowaniu mocarstwowej pozycji Federacji Rosyjskiej w świecie*. Warszawa: Akademia Obrony Narodowej.
- Terlikowski, M. (2018). *Pierwsze projekty PESCO: w poszukiwaniu przełomu*. „Biuletyn Polskiego Instytutu Spraw Międzynarodowych” (PISM), nr 65(1638) z 8 maja 2018 roku. Polski Instytut Spraw Międzynarodowych.

