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PROLIFERATION OF BALLISTIC AND CRUISE MISSILES, AN INCREASING THREAT UPON THE EASTERN EUROPEAN'S OPERATIONAL ENVIRONMENT STABILITY

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The threat posed by the proliferation of ballistic and cruise missiles to NATO states and forces in Europe has become an intensely debated topic recently, especially amid the US exit from the Nuclear Forces Treaty and the relaunch of a new arms race especially due to some states' desire to reaffirm themselves as regional and world military powers, states that have repeatedly shown their willingness to use military force, including the available arsenals of missiles, in order to achieve their objectives. This real threat is supported by the ballistic and cruise missile development programs carried out by states such as Russia and Iran, countries that consider the US and NATO as the main threats to their security.

Keywords: ballistic missiles; cruise missiles; threat; operational environment.

The Eastern European operational environment is dynamic and complex, with a multidimensional, multinational and interinstitutional character. It includes all the environments in which military action can take place and is an "arena" in which existing actors, state or non-state, allies or enemies, act to achieve the proposed objectives, using all available tools and means (political, economic, military, etc.).

The risks and threats to the Eastern European operational environment are various and cover the entire existing range, from classical to asymmetric and hybrid threats, which are used against NATO's vulnerabilities in its Eastern flanking states to create a framework leading to the aggressor's strategic set goals achievement. Out of the multitude of existing threats, the ballistic and cruise missiles continue to increase their importance nowadays, especially due to their destructive potential, as they represent a multiplier of military power and a deterrent factor used by most state and non-state actors. Although stability and security are priorities within the European states' agenda, as they are two necessary conditions for evolution and prosperity, the European operational environment, and in particular Eastern Europe, faces a number of risks and threats that directly and indirectly affect the physical, economic and social security of the population.

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Ballistic and cruise missiles – multiplier of military power

Although the beginning of the use of missiles in combat date back to 1232 (China), the first ballistic and cruise missiles used in an armed conflict were the V-1 missiles (the first cruise missile) and V-2 (the first ballistic missile), of German origins, used in World War II to bomb London (about 1500 V-1 and V-2 missiles used). With a range of up to 300 km and a classic payload of one tone, these missiles sowed panic among the population and caused significant human casualties (over 23,000 dead and wounded[1]) and material losses, being considered „weapons of terror" at that time. In order to destroy German's infrastructure of the production and launch of cruise and ballistic missiles, the Allies carried out a large-scale air operation launching over 32,000 tons of bombs[2], managing to reduce but not stop their production and usage. Everything would end only after the conquest of the launch positions and production facilities by the allied land forces.

After the end of World War II, ballistic and cruise missiles experienced an accelerated development, with the world's great military and economic powers understanding the benefits of having such weapons systems and the fact that

they are "an instrument of power in international relations whose specific gravity increases in proportion to the range of the ballistic missile and the destructive power of the combat payload"[3]. Basically, there was an arms race between the two superpowers (USA and USSR), which invested heavily in the development of ballistic and cruise missiles, significantly improving all the parameters that characterize these missiles (range, combat payload and accuracy) and they have created considerable arsenals of destruction. Along with the two great military powers of the world, other countries have been concerned with the acquisition and development of these missiles also, motivated by the fact that the possession of such weapons discourages states with aggressive intentions from acting against them.

Due to their destructive potential, ballistic and cruise missiles were used in four of the last six major wars: the Arab-Israeli War (1973), the Iran-Iraq War (1980-1988), the Gulf War (1990-1991) and the War in Afghanistan[4]. However, the most recent conflict involving the use of ballistic and cruise missiles is the Yemeni Civil War (which began in 2015), in which Iran-supported Houthi rebels fired hundreds of ballistic missiles at Arab coalition bases, several populated centers and infrastructure elements. Moreover, the rebels used cruise missiles to attack coalition ships, US Navy warships, and transport ships, including oil tanks. The common element of these conflicts is the fact that the use of ballistic and cruise missiles caused significant losses, especially among the civilian population, and destroyed the existing infrastructure in large urban centers, causing very large material losses.

The evolution of ballistic and cruise missiles has been a spectacular one, especially after the '80s, reaching nowadays to missiles that cover impressive distances, intercontinental (up to 16,000 km[5]), with supersonic speeds and that carry a varied load, with MIRV – Multiple Independently targetable Re-entry Vehicle), capable of hitting a large number of important targets and with warheads that can be activated on the last flight portion of the missile (MARV – Maneuverable Re-entry Vehicle), used especially against mobile targets. Missiles can also carry nuclear, bacteriological and chemical payloads, making them even more dangerous.

The devastating effect of nuclear payloads was proved in 1945, during the bombing of the two Japanese cities: Hiroshima and Nagasaki, when more than 120,000 people lost their lives and more than 90% of the buildings were destroyed. Realizing the destructive effect of nuclear missiles, the world began to strive to limit and reduce nuclear arsenals, "the strategy based on the threat of mutual nuclear destruction" no longer being so often used in the dialogue between the great powers"[6]. However, the nuclear component of military power will continue to be a main pillar and will continue to offer nuclear-weapon states the opportunity to negotiate from advantageous positions with other states at the international level.

Ballistic and cruise missiles can be used in all confrontational environments: land, air, sea and more recently, cosmic. Although most of them are launched from the ground/underground (by fixed or mobile systems), they can also be launched from ships, submarines, aircrafts and more recently even from military satellites (the great military powers of the world being concerned with equipping satellites with offensive weapons systems). Possession of a wide range of ballistic and cruise missiles, capable of being launched from already established confrontation environments (land, sea, air, space), considerably amplifies the military power held and discourages the aggressive intentions of other states, eager to expand their influence beyond their borders.

If the monopoly on cruise missiles is held by countries such as the USA, Russia and China, which rely on advanced military technology (space technology), in the case concerning ballistic missiles, other countries have emerged, such as Pakistan, North Korea and Iran, which do not have access to very advanced technology, but which produce and introduce them into their arsenals owning these missiles allowing them to negotiate from other positions and show inflexibility within international negotiations. A conclusive example in this regard is Iran's attack on US bases in Iraq (January 8, 2020) with ballistic missiles (15-22 short-range ballistic missiles[7]), the attack representing a retaliation for the death of General Qasem Soleiman (commander of the Force Quds of the Iranian Revolutionary Guards) caused by the American special forces. This attack impressed by the fact that Iran, although not a state in the top 10 of the world military powers, but with a significant arsenal of ballistic and cruise missiles (4th place in the world in the number of missile launchers[8]),

attacked US military bases, the world's largest military power.

Possessing impressive arsenals of ballistic and cruise missiles, whether or not they carry nuclear payloads, is a tool capable of influencing the outcome of international relations in favor of their own interests and offers the possibility of projecting military power over long and very long distances. Despite not being one of the world's major economic powers, the Russian Federation has the largest arsenal of ballistic and cruise missiles in the world, and in this context is among the states capable of influencing global and regional policy for their own interests. Its actions over the last ten years (the Chechen War, the Georgian War, the illegal annexation of the Crimean Peninsula and the destabilizing actions in eastern Ukraine) demonstrate its desire to reaffirm its status as a major regional and global power, to restore the sphere of the ex-Soviet influence based on the use of military power and threats with using the arsenal of ballistic and cruise missiles, to achieve its set objectives.

Russian ballistic and cruise missiles – an emerging threat to the Eastern European operational environment

Following the illegal annexation of the Crimean Peninsula, which was "the most important event on the European scene in recent times"[9], the Russian Federation has begun an extensive process of militarizing the region by deploying numerous ballistic and cruise missiles systems, which can be launched from the ground / underground, air, water or under the water, transforming the peninsula into an A2/AD (Anti Access/Area Denial) area, obtaining total control of the Black Sea basin.

Below there are several types of ballistic and cruise missiles deployed in Crimea:

• *the SS-26 Iskander missile system,* equipped with short-range ballistic missiles (SRBM) – 400-500 km), launched from a mobile carrier, capable of carrying multiple warheads, including nuclear, with the possibility to easily hit targets located in NATO's eastern flank;

• *the Kh-47M2 Kinzhal missile system*, equipped with Air-Launched Ballistic Missiles (ALBM), on MiG-31K / Tu-22M3 aircraft, with a range of 1,500-2,000 km[10], entered in service in 2017, developing supersonic speeds (Mach 10);

• *the Kh-101 / Kh-102 missile system*, equipped with air-launched cruise missiles (ALCM – Air Launched Cruise Missile), with a range of 2,500-2,800 km, which fly at very low altitudes and are made of a composite material that absorbs electromagnetic waves, being very difficult to be detected by radars;

• *the Kalibr missile system*, equipped with cruise missiles with a range of up to 2,500 km, which can be launched from the ground, ships or submarines.

By deploying these missiles, the Russian Federation has the opportunity to hit important targets anywhere in Europe and can hit naval targets as far as the Marmara Sea, beyond the Bosphorus Strait.

The category of ballistic and cruise missiles with an impact on the Eastern European operational environment also includes Bulava missiles, ballistic missiles launched from the submarine SLBM (Submarine Launched Ballistic Missile) with a range of 8,300 km, each missile having the ability of carrying up to 10 warheads. These ballistic missiles are intended for Borey-class nuclear submarines, each submarine being able to carry 16 launch facilities[11], with the possibility of hitting various strategic objectives in Europe.

Another category of missiles with impact upon the European operational environment are *TOPOL-M missiles*, intercontinental ballistic missiles with a range of 11,000 km, capable of carrying a single nuclear warhead, with the possibility of being launched from a silo or from mobile launchers, most of the fixed launchers being located in the Western Military District, near the eastern flank of NATO. As their technology is relatively old (1997), the Russians developed and improved them by new types of ballistic missiles *RS-24 Yars* (2010), capable of carrying three nuclear warheads instead of one and which are planned to gradually replace the intercontinental ballistic missiles TOPOL -M.

In addition, the Russian Federation is preoccupied with the development of missiles of very high speed, hypersonic, which can reach 20 Mach, and are difficult to detect and very difficult to intercept/counter. The technology of these missiles involves two ways of launching: the first involves the use of a ballistic missile that carries the hypersonic missile on the initial part of the

trajectory, and at some point it detaches following sinuous trajectories; the second involves the use of a rocket engine capable of printing hypersonic speeds throughout the flight, in this case cruising missiles[12].

From the category of Russian hypersonic missiles, developed or under development we can mention: *Avangard missiles*, developing missiles, with a range of over 6,000 km, which will be transported to the target by the famous intercontinental ballistic missiles RS-28 SARMAT (radius up to 18,000 km), which are also being tested and developed; *3M22 Zircon* / SS-N-33 missiles, anti-ship cruise missiles with a range of 1,000 km[13], which during their flight are covered by a plasma cloud that absorbs electromagnetic waves thus becoming invisible to radars. Basically, by owning these supersonic missiles, Russia is ahead of the USA, the main competitor in the field, which will present the first supersonic missile in 2021.

Considering the context in which the relations between Russia and the West are not very good at this moment, mainly due to the crisis in Ukraine and Syria, but also the installation of the anti-missile system in Europe, a system that according to the Russian Federation has offensive potential being able to deploy ballistic missiles (missiles successfully tested by the US, after leaving the INF-Intermediate Nuclear Forces Treaty), the use of ballistic and cruise missiles is a major threat to the Eastern European operational environment, for countries such as Poland and Romania which host elements of the anti-missile system, objectives of strategic importance targeted by the ballistic / cruise missiles of the Russian Federation.

Ballistic and cruise missiles –
a tool at the fingertips of unstable states
in the Middle East

One of the countries of the Middle East that is characterized by high instability, due to internal problems, strong links with a number of banned terrorist and militant groups in the region and due to its foreign anti-US policy and against its allies, but with the largest arsenal of ballistic and cruise missiles in the Middle East, is Iran. This state-actor is a country that throughout its history has been in conflict with most of its neighbors, especially due to its aspirations for the status of regional military power, leader in the control of energy resources in the area or control of transport routes of these resources.

Iran, as a military power, has the largest arsenal of ballistic and cruise missiles in the Middle East and it uses it to design power in its areas of interest. Although Iran's desire to develop ballistic missiles dates back to the 1960s, it did not begin to develop the infrastructure needed to produce them until the late 1980s, when it received a SCUD missile production facility from North Korea. Thus began the program of development and production of Iranian missiles, ballistic and cruise missiles that became the mainstay of its deterrence and response strategy.

Iran's arsenal is rich and diverse, with thousands of ballistic and cruise missiles, some capable of hitting targets in Israel and southeastern Europe. Among the most important missiles, relevant to our study, we may mention:

- *Ghadr missiles* (Shahab-3 version), intermediate-range ballistic missiles (1,950 km[14]) entered service in 2007, capable of carrying conventional, chemical and nuclear payloads;
- *Emad missiles* (version of the well-known Iranian Shahab-3 missile), intermediate-range ballistic missiles (1,700 km[15], some sources say they can reach up to 2,500 km), entered service in 2015, can be guided and controlled to the target (according to statements made by the Iranian Minister of Defence) and can carry the same cargo as Ghadr missiles;
- *Soumar missiles*, cruise missiles with a range of 2,000-3,000 km[16], capable of carrying conventional and nuclear cargo (some experts say that these missiles originate from the Russian Kh-55 missiles, and in this context could carry nuclear payload[17]);
- *Sejjil missiles*, ballistic missiles with a range of 2,000 km, launched from mobile conveyors, capable of carrying conventional and nuclear payloads.

All the above presented ballistic and cruise missiles have the possibility to hit targets within several countries on the eastern flank of NATO (Bulgaria, Romania, Hungary, etc.), representing a real danger to the Eastern European region, especially in the context of the US forces stationed within these areas and amid strained relations between Iran and the United States. Iran has shown that it is capable of retaliating, having as

proof the attacks on US bases in Iraq, and from this point of view this emerging threat must be taken very seriously, even if the US / NATO anticipated the danger and installed an anti-missile system in Europe. Moreover, Iran is one of the countries that supports several international terrorist organizations such as Hezbollah and Houthi with missiles, as well as some terrorist groups that along with ISIS play a major role in destabilizing the Middle East, which already is quite volatile.

Iran is a country with aggressive behavior that does not hesitate to use its arsenal to achieve its goals. In the period 2017-2020, Iran launched several ballistic and cruise missile attacks on Syria (targeting ISIS positions in 2017), on Saudi Arabia (targeting the oil facilities at Abqaiq and Khurais, which provide 5-7% of daily oil in the world, in 2019) and on Iraq (targeting the headquarters of the Democratic Party of Iranian Kurdistan located in Koya, in 2018 and the American bases in Al-Assad and Erbil, in 2020)[18].

Iran's interest to develop intercontinental ballistic missiles with a range of more than 5,500 km is a major threat to the European operational environment as Iran sees the United States and its allies as the biggest threat to its security and an obstacle to its assertion towards a regional power. Also worrying is the cooperation between the Russian Federation and Iran (in 2015 Iran provided the Russian Federation with the Hamadan air base for airstrikes against Syria[19]), the Iranian side wanting to import military equipment and technology from Russia, the first acquisition being SA 20 anti-aircraft missile system (modernized S-300 system). The acquisition of long-range ballistic missiles or the technology needed to develop them would be a major challenge for the Alliance, but especially for NATO's Eastern flank states, which are the first to be targeted in the event of a possible attack.

In conclusion, considering the US withdrawal from the Intermediate Nuclear Forces Treaty, a treaty between the United States and the Soviet Union to control and limit nuclear-loaded ballistic missiles, a new arms race is being relaunched, allowing several states to purchase and develop new ballistic and cruise missiles, with multiple payloads and high accuracy. In this context, European security is in danger, with some experts saying it is possible that in the near future we will return to the 1980s situation when Russian missiles were aimed west. Against the background of this new arms race, in which the main actors (Russia, USA, China and Iran) have shown their interest for the development of new ballistic and cruise missiles, the stability and security of the Eastern European operational environment is threatened, with the possibility of a missile attack being increasingly plausible. In this new context, there is a need for an effective strategic air defence system on NATO's eastern flank, an integrated system that can deter and counter attacks conducted with ballistic and cruise missiles.

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