FORUM:	Disarmament Commission
ISSUE:	Measures to Combat the Proliferation of Hypersonic Weapons
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Introduction

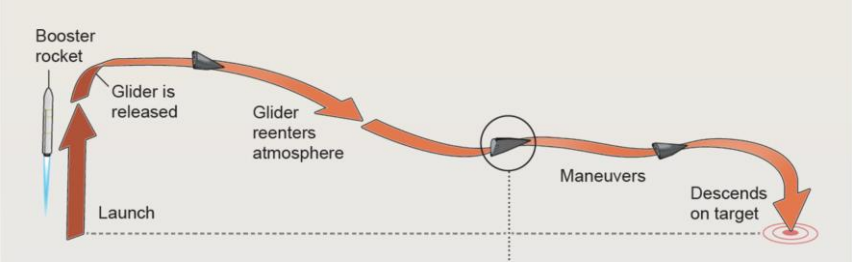
Hypersonic weapons, which can travel at speeds of Mach 5 or higher, represent a significant advancement in military technology of 21th century. The development of hypersonic technology has mainly focused on missile systems, enabling missiles to strike targets from long range with exceptional speed, accuracy, and destructive power. This characteristic makes hypersonic weapons an effective weapon in modern warfare as it is extremely difficulty to intercept them. Hypersonic missiles, exemplified by Russia's Kh-47M2 Kinzhal Missile, have earned particular attention recently. The Kh-47M2 Kinzhal, first used by Russia against Ukraine in 2022, marked the first documented use of a hypersonic weapon in actual combat. This deployment underscored the capabilities and strategic advantages of hypersonic weapons, highlighting their potential danger and threat on future military engagements. The potential for fear and the unparalleled destructive capability of hypersonic missiles armed with nuclear warheads have prompted the international community to prepare measures aimed at preventing the proliferation of hypersonic weapons.

Kh-47M2 Kinzhal, Russia's hypersonic missile

Background

The emergence of hypersonic weapons has sparked global concern due to thier potential damage, particularly when used with nuclear warheads. Intercepting a missile traveling at speeds of Mach 5 or higher is extremely challenging. Conventional missiles follow a predictable parabolic trajectory, rising to a certain altitude before descending towards the target, which allows for effective and relatively easy

interception by using already-existing ground-based air defense systems. However, the hypersonic missiles developed after the 2000s exhibit different characteristics. Unlike conventional missiles, some hypersonic missiles can be controlled after launched, flying in unpredictable trajectories, thus attacking the target with higher accuracy rate. For this reason, the neighboring countries of hypersonic missile-bearing countries are threatened with their national security.



Trajectory of hypersonic weapons

A notable example is Russia's Kh-47M2 Kinzhal missile, which was recently deployed against Ukraine by Russia. In February 2022, Russia launched a full-scale attack on Ukraine, and that's when Russia began using their latest fighter jets, missiles and other advanced weapons in the Russia-Ukraine war. The war escalated in 2023 when Russia used its Kinzhal hypersonic missiles in combat for the first time. While Ukraine and the United States claim to successfully intercepted the Kinzhal with the Patriot ground-based air defense system, Russia disputes this assertion. The Kinzhal missile exemplifies the advancements in missile technology that have made interception increasingly difficult. Unlike conventional ballistic missiles, hypersonic missiles can maneuver during flight, making their paths almost impossilbe to predict and more challenging for defense systems to track and intercept.

In addition to Russia, other countries such as Iraq and North Korea are actively developing hypersonic missiles. North Korea, in particular, has been consistently testing hypersonic missiles since 2022. Although North Korea claims its missiles can achieve a maximum altitude of 72.2 km and a range of 1,000 km, South Korea contends that their range is only 700 km. South Korean weapon experts noted that the irregular flight paths and extreme speeds of these hypersonic missiles make accurate observation and interception difficult. If North Korea successfully develops hypersonic missiles, South Korea and Japan, due to their proximity, will find it difficult to defend against potential missile attacks from North Korea, significantly enhancing North Korea's military strength. Preventing the proliferation of hypersonic missile technology to North Korea is crucial to ensure its military power does not become a global threat.

The increasing prevalence of hypersonic weapons highlights the need for the international community to devise countermeasures. The extreme speeds and maneuverability of these missiles make existing missile defense systems less effective, as they are not advanced enough to intercept objects flying at such extreme speeds and with unpredictable trajectories. The development of hypersonic weapons presents a significant challenge to global security. Their unpredictable paths, high speeds, and potential danger for carrying nuclear warheads make them a formidable threat.

Problems Raised

Russia-Ukraine War

Ukraine faces significant challenges due to the increasing use of hypersonic missiles by Russia. Since the 2022 invasion, Russia has employed these advanced weapons in its ongoing conflict. Although Ukraine has managed to intercept many of these missiles with the help of defense systems provided by the United States, the relentless attacks pose a severe threat. How severe was the attack? How many people die from those attack? What did Ukraine do to fight against those threatening weapons? The future costs of defense and the inevitable damage from continuous missile strikes are major concerns for Ukraine moving forward. Add some statistical data to improve details.

Threat to neighboring countries

Entering the 2020s, North Korea has consistently conducted missile tests, intensifying its efforts to develop hypersonic missile technology. These test launches, often directed into the sea between South Korea and Japan, have significantly heightened security concerns for both nations. North Korea asserts that its most recent missile is a long-range hypersonic missile capable of flying more than 1,000 kilometers, further escalating regional tensions. The persistent missile tests not only pose a direct threat to the security of South Korea and Japan but also contribute to an arms race and destabilize the geopolitical landscape in East Asia. In 2022, not only North Korea but also Iraq claimed to have developed hypersonic missiles. Currently, Iraq is engaged in the Israel-Iraq conflict with Israel. Although there are no reports of Iraq using these missiles, rumors of their possession suggest that Israel, which is at war with Iraq, must remain highly vigilant. As North Korea and Iraq continues to advance their missile capabilities, the international community remains on high alert, closely monitoring the situation and seeking diplomatic solutions to mitigate the potential threats on their neighboring countries.

International Actions

Military support

The most notable international response is the military support provided by the United States and its allies to Ukraine. Although they are not directly engaging in combat, they have consistently supplied Ukraine with essential supplies and advanced weaponry since the outbreak of the war. Among these contributions, the U.S.'s Patriot, ground-based air defense system, stands out as a crucial defense system for Ukraine. This advanced defense system has played an important role in countering Russia's

hypersonic missiles, significantly improving Ukraine's security and defense capabilities. What is air defense system? Provide explanation for this term.

Enhancing air defense systems

Another effective strategy for preventing the proliferation of hypersonic missiles is to strengthen air defense systems. Unlike nuclear and chemical weapons, which are restricted by international laws due to their catastrophic impact on civilian populations, hypersonic missiles currently face no such international regulations because they do not cause unstoppable damage like nuclear and chemical weapons do. When hypersonic missiles are equipped with nuclear warheads, they can be a significant threat, however, without nuclear warheads equipped, hypersonic missiles are just missiles that are faster than others. For this reason, the international community does not regulate the development and trade of hypersonic missiles. As it is not possible to regulate the development of hypersonic weapons worldwide, enhancing defense capabilities is crucial in preventing the potential threats posed by proliferation of hypersonic weapons. A notable example is the U.S.'s Patriot ground-based air defense system, which has demonstrated effectiveness in intercepting and neutralizing hypersonic missiles in Russia-Ukraine War.

Key Players

The Russian Federation

Russia is currently the only country known to have used hypersonic missiles in combat and is a significant force in their proliferation. Russia continues to develop and deploy these advanced weapons, boasting long-range hypersonic missiles capable of traveling over 1,000 kilometers. Notable examples include the Zircon and the Kh-47M2 Kinzhal.

Russian supersonic interceptor Mikoyan MiG-31 armed with Kh-47M2 Kinzhal

Ukraine

Although Ukraine does not develop or proliferate hypersonic weapons, it is a major victim of the proliferation of hypersonic weapons that are subject to continuous hypersonic missile attacks by Russia.

In February 2022, Russia attacked Ukraine, resulting in the Russia-Ukraine War, and almost immediately Russia used their hypersonic missiles. In 2024, Ukraine and the United States claimed that they have successfully intercepted Russia's hypersonic missiles using their ground air defense systems, but with Russia's continued attacks, the damage caused by hypersonic weapons will continue to increase.

North Atlantic Treaty Organization (NATO)

Since the beginning of the Russia-Ukraine war, NATO has been developing countermeasures against Russia's hypersonic missiles. Although NATO is not directly involved in the conflict, it has been aiding Ukraine by supplying advanced ground-based air defense systems, such as the Patriot and IRIS-T SLM. These systems have enabled Ukraine to successfully intercept Russia's hypersonic missiles, highlighting the importance of international support and cooperation in Ukraine's defense systems. NATO's assistance enhances Ukraine's immediate defense capabilities and helps deter the use of hypersonic missiles by Russia.

The United States of America

The effectiveness of U.S.'s ground-based air defense systems against hypersonic missiles has been proved in the Russia-Ukraine war. The U.S. provided Ukraine with advanced air defense systems such as the Patriot and IRIS-T SLM, which were successfully used to intercept Russia's Kinzhal hypersonic missiles so far. This represents the capability of U.S.'s defense systems to counter advanced missile threats. Concurrently, the U.S. is a leading developer of hypersonic missile technology. Since the 2000s, the U.S. has been actively researching and developing hypersonic missiles, conducting a successful test flight of long-range hypersonic missiles by the U.S. Navy and U.S. Army in June 2024.

Picture of MIM-104 Patriot

Possible Solutions

International monitor and track system

One effective solution for preventing the proliferation of hypersonic missiles is establishing an international monitor and track system. This system can oversee each country's hypersonic missile

development process, current status, and scale of advancement. By monitoring such activities, the international community can gain insights and advance warnings, allowing for the timely preparation and implementation of countermeasures. This proactive approach not only helps to prevent the unauthorized development and proliferation of hypersonic missile technology but also can promote greater transparency and trust among the nations.

Forming alliance among countries

Forming an alliance among countries can significantly restrict the spread of hypersonic missiles. Strong nations within the coalition, such as the United States and its allies, can enhance the defense against hypersonic missiles by providing and establishing advanced defense systems for other country members of the alliance. Furthermore, by cooperating and closely monitoring each other's activities, allied countries can effectively restrict the development and export of hypersonic missile technology. This collaborative approach not only strengthens collective defense capabilities but also promotes mutual accountability and transparency, thereby reducing the risk of proliferation of hypersonic weapons.

Glossary

Ground-based air defense system

Ground-based air defense systems are land-based fixed assets and mobile platforms from aerial threats such as combat aircraft, attack helicopters, unmanned air vehicles (UAVs), incoming missiles, guided munition, and rockets.

Warheads

The explosive head of a missile, torpedo, or similar weapon.

Hypersonic

Relating to speed five or more times that of sound in air

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