

Missiles, Missile Defense, and Space Weaponization

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The emerging missile threat and missile race

Although the missile threat was reduced after the end of the Cold War, missile proliferation and its link to weapons of mass destruction (WMD) remains an international security concern. Nuclear weapons could potentially be delivered by a number of systems, including aircraft, ballistic missiles, cruise missiles, artillery and unmanned aerial vehicles (UAVs), as well as a wide range of low-technology options, such as civilian cars, ships or even suitcases.

Ballistic missile technology has spread to more than 30 countries, many of which have access only to Scud variants of short range (below the “Scud barrier” of 1000 km). Other than the NPT-recognized nuclear weapons states, only North Korea, India, Iran, Israel, and Pakistan have produced or flight-tested intermediate-range ballistic missiles with a range of between 1,000 km and 5500 km (the “INF barrier”). Iran denies intentions to build nuclear weapons. For the time being, only the five nuclear weapon states—the USA, Russia, the UK, France and China—have intercontinental ballistic missiles (ICBMs). All those states continue to develop and test their missile arsenals. More countries have access to missile technology, such as Germany and Japan, but did not follow that path.

To overcome the Scud and INF barriers is a challenging and costly task, particularly as key components (e.g. accurate guidance, composite materials, thrust vector control, reentry technology) are not easily available on the market. Instead of going ballistic, countries could rely on cruise missiles which cost much less and are easier to acquire and to maintain, require less training and logistical support, and perform with better accuracy and reliability than ballistic missiles. Even more accessible are UAVs which have a high civil–military dual-use potential, and which are relatively cheap, available and easy to handle.

The use of artillery rockets and UAVs by Hezbollah against Israel demonstrates that the use of such weapons no longer is the exclusive privilege of technologically advanced state armies; it has become an option for low-tech states and non-state actors. This represents a significant addition to the missile threat.

Without adequate arms control strategies broadly supported by the international community, the risks of missile proliferation are likely to increase as long as technical capabilities are spreading and regional conflicts provide incentives to acquire advanced weapons. The United States seeks to counter the missile threat with preemptive strikes and missile defense, both of which are fuelling the missile arms race. There is an intensified drive to develop and deploy missile defense systems, despite widely-held skepticism over whether a multi-billion-dollar missile defense system actually will diminish the missile threat. Despite having spent more than \$110 billion on missile defense since 1985, the United States still does not have a reliable and tested architecture in place.

Several NATO member states and European companies are developing missile defense systems in cooperation with the United States, as are non-NATO states, including the Republic of Korea, Japan, Australia and Israel. India recently tested a system designed to intercept short and medium-range missiles. This activity is underway despite the fact that strategic missile defense still is not a proven technology and has yet to be tested in operationally realistic conditions.

Missile defense has potentially negative impacts on prospects for the reduction and elimination of nuclear forces. One example is the controversy over the US plan to deploy a missile defense system on two new military bases in Poland (for interceptors) and the Czech Republic (for a radar installation), purportedly intended to defend against Iranian missiles. Russia has objected strongly to this plan, arguing that the system could be used against its ICBMs and thus would undermine strategic stability. The controversy contributed to Russia's decision to "suspend" implementation of the Conventional Forces in Europe Treaty and the threat to abandon the 1987 INF Treaty, and has prompted belligerent statements that Russia would target the missile defense sites.

This demonstrates that military responses to the missile threat, such as nuclear deterrence, preemption, counter-proliferation and missile defense, may aggravate the risks and provoke proliferation rather than prevent it. An offense-defense missile race could undermine international stability and disrupt regional balances. Removal of these weapons is an urgent issue on the international agenda.

Towards international missile control

To reduce the emerging missile threat, the time to take political action is now. The NPT preamble emphasizes "the elimination from national arsenals of nuclear weapons and the means of their delivery pursuant to a Treaty on general and complete disarmament under strict and effective international control," but the NPT does not further specify how this ultimate goal could be achieved for delivery systems.

Besides US-Russian agreements, there are no treaty constraints on the acquisition, development and deployment of missiles. The Missile Technology Control Regime, (MTCR) largely based on export controls among potential missile suppliers has been able to slow down or even end some missile programmes, but its effectiveness is limited if motivation to acquire missiles persists.

Limited efforts to curb missile proliferation have been undertaken, such as the Hague Code of Conduct, the Proliferation Security Initiative, and UN Security Council Resolution 1540. More far-reaching ideas, like the Russian proposal for a Global Control System and a Global Monitoring System on missile technology, have not been implemented. The UN Panels of Governmental Experts on Missiles have failed to reach agreement on substantive recommendations. It is unlikely that really effective measures to stop missile proliferation will be taken absent progress on limiting, reducing, and eliminating existing holdings, particularly those of the original nuclear weapons states. However, in recent years, arms control and disarmament have not been seriously considered for missiles, and other delivery systems have also been largely neglected.

The key for further progress is to find mechanisms that restrain both capabilities and motivation to acquire missiles. At the 1986 Reykjavik summit, Presidents Reagan and Gorbachev considered proposals for global elimination of ballistic missiles which were revisited after the end of the Cold War, for instance in the Zero Ballistic Missiles concept put forward in 1993 by the Federation of American Scientists and supported by Paul Nitze and others. In 1996, the Canberra Commission called for a “global treaty controlling longer range ballistic missiles” and, as an interim step, exploration of a missile flight test ban. Test restrictions would effectively prevent new missile designs and limit modification of traditional technology. To address concerns about asymmetries and discrimination, a “missile freeze” could cover offensive and defensive missiles.

The feasibility of missile control has been explained in *Beyond Missile Defense*, a 2002 briefing paper of the International Network of Engineers and Scientists Against Proliferation. The US-Soviet/Russian arms control experience shows that the deployment and storage of missiles can be monitored by satellite, and their destruction per agreement can be verified by on-site inspection. Missile tests can be monitored, and much of the infrastructure for missile development—e.g., production facilities, test ranges, missile containers—is susceptible to monitoring. An intermediate step towards a global missile ban would be a global INF Treaty.

In addition to controlling the weapons, building international and regional security regimes, combined with political and economic cooperation, would provide incentives to diminish reliance on missile arsenals. Regional approaches for arms control could include confidence-building measures like launch notification and exchanges of information, establishment of data centers, conversion programs. Diplomatic initiatives are required to reduce the role of ballistic missiles in critical regions (Northeast Asia, South Asia, Middle East) and to develop an international norm against ballistic missiles. The importance of regional approaches to disarmament and confidence building was demonstrated in South America (Argentina and Brazil) and South Asia (India and Pakistan).

A control regime on ballistic missiles could be extended to the international control of ballistic missile defenses, reversing the US withdrawal from the Anti-Ballistic Missile Treaty in 2002 and fulfilling the 2000 NPT commitment to the preservation and strengthening of that treaty. The terms of a new treaty could be made more precise and verifiable and/or be universalized. Such limits would relate to the altitude, relative distance and velocity of interceptor tests, and to limits on laser brightness or to the aperture of sensors and mirrors.

Prevention of an arms race in outer space

Control of missiles and missile defenses links to prevention of the weaponization of outer space, especially due to the close relationship between ballistic missiles and space launchers and the possibility that missile defense programs will pave the way for the full-fledged weaponization of space. While challenging, on-site monitoring of space rocket programs can minimize the risk that they will contribute to ballistic missile development. The case for a regime to control and monitor space launchers is greatly strengthened in the context of preventing an arms race in outer space. Since man-made objects in orbit would enter space through space launchers, a monitoring system at space launch facilities could not only search for indications of

ballistic missile use, but also for the space-weapon usability of the payload. This would provide increased transparency concerning space activities in general, and would effectively exclude the deployment and testing of space weapons using ground-based space launchers.

Since both missiles and missile defenses have a capability to attack satellites, their control relates directly to the protection of space-based objects. Destruction of satellites using ground or sea-based missiles or anti-missiles was demonstrated by the United States and the Soviet Union in the 1980s, and by China in 2007 and again the United States in 2008.

Outer space has been widely acknowledged as a common heritage of humankind, which should be used for the benefit of all countries. The international community has long been calling for the prevention of an arms race in outer space, seeking to strengthen international space law and arms control in space by introducing provisions against the weaponization of space. Russia and China presented a “draft treaty” in February 2008 at the Conference on Disarmament that was rejected by the United States, which continues to seek space dominance. Vulnerabilities and threats would be considerably increased with advanced space weapons, such as maneuverable space mines, micro-satellites, kinetic kill vehicles, chemical and nuclear explosives, or particle, microwave and laser beams. Transforming space from the “common heritage” of mankind into a “high frontier” for space warfare where weapons are used “to, from, in and through” space, contains considerable risks for all states, including the United States.

To avoid these risks, the transition from the militarization to the weaponization of space needs to be prevented. Comprehensive space arms control would seek to ban weapons against objects in space and from objects in space against any target, and would prohibit development, testing, and deployment of such systems altogether before more advanced weapons are tested or become operational. A comprehensive approach could integrate risk reduction measures and partial agreements in a phased approach. This would be also attractive to the general public and require an unprecedented degree of international cooperation.