Ballistic Missile Defense in Europe

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November 2010

Executive Summary

The study comes to the **following conclusions**:

A. Threat assessment:

1. **The current missile threat to European territory is limited to conventionally equipped short-and medium-range missiles (S/MRBM)** that can reach parts of Europe. It is entirely unclear whether this will change in the foreseeable future, e.g. by Iranian nuclear-tipped missiles with longer ranges. A state that wants to strengthen its deterrence by deploying nuclear weapons might favor ballistic missiles of medium to intercontinental ranges (MRBM/ICBM), it can, however, also develop long-range cruise missiles with heavy payloads for that purpose. The latter could not be defeated by the currently available missile defense systems. To date, neither Iran nor North Korea has access to both ICBMs and weapons of mass destruction – a combination that, in principle, could justify a territorial missile defense system.

2. In recent years, the **Islamic Republic of Iran** has made some significant advances in the field of missile development. This includes not only the successful injection of a 27 kg satellite into low earth orbit in February 2009 using a rocket-cycle, **but also the early development of medium-range missiles with a range of 2,200 km**. Prior to deployment, these new MRBM has to be tested for several years. It is noteworthy that not only Russian and North Korean liquid-propellant technology is available to Iran, but also more powerful solid missile engines which could be the basis for long-range missiles. It is unclear whether a decision for such military developments has already been made. If Iran will further expand its BM capabilities it is likely that the country will continue to depend on foreign aid. The Islamic Republic of Iran is also suspected to develop nuclear weapons. It will be decisive to push Iran, which is a non-nuclear-weapon state within the

NPT, to operate uranium enrichment for civilian purposes under strict international control.

3. **North Korean attempts** to develop long-range missiles have so far been unsuccessful. The few tests of multistage missiles or satellite carriers failed. The tested shorter-range missiles are apparently imported out of date weapons. The lack of a deployment of a reliable MRBM points out that **North Korean missile program is stagnating**.

4. **The utilization of arms control instruments to curb missile proliferation (such as HCOC) is not strong enough and should be promoted.** However, this depends also crucially on the overall regional security situation, especially in the Middle East and South and East Asia. The establishment of a global INF Treaty should be addressed.

B. Ballistic Missile Defense (BMD)

5. The long history of missile defense relieves that despite considerable financial and technological investments **it was not yet possible to build a reliable, viable and cost-effective strategic missile defense system.**

6. The BMD technologies favored by the United States are on the one hand the currently tested kinetic hit-to-kill technology, and on the other hand the laser technology developed for the U.S. Airborne Laser "(Directed Energy Weapon). The development of a reliable defense system against approaching ballistic missiles and their warheads is technologically very demanding and associated with large financial outlays. **The precondition for the final deployment of a BMD system must be a comprehensive and realistic testing program that incorporates many operative conditions.**

7. The already difficult task to destroy a warhead – moving through space at hypersonic velocities – in flight, can be heavily complicated or made impossible by the attacker through **the use of countermeasures**. These include not only the use of simple decoys on-board of a missile's payload and maneuverable warheads, but also the disturbance or information overload of the radar, as well as the increased production and deployment of additional missiles in peacetime (arms race). The majority of U.S. BMD systems have not been subject to any realistic interception test yet and the "countermeasures" problem remains unresolved. As a result, at the moment, there is conceptually no high rate of successful intercepts against WMD warheads but the gradual development and enhancement of interceptors is expected to go further on.

C. Missile defense systems for Europe

8. Our simulations of missile trajectories showed that the European Midcourse Defense (EMD) system, which was favored by the Bush-Jr. administration and supposed to consist of ten interceptors (GBIs) in Poland and a X-band radar in the Czech Republic, could not have covered all parts of Europe in order to protect them against long-range missile attacks from the Middle East. It would, however, have had an **impact on Russia's armament behavior**, due to its inherent capacity to detect and catch Russian missiles.

9. The decision by President Obama to renounce the deployment of the EMD components in Poland and the Czech Republic eliminated – at a first glance – a major issue of concern for Russia and makes **further nuclear disarmament steps in the framework of the N-**

START Treaty possible. Based on a change in the threat analysis, the Obama administration decided to modify the EMD proposal in favor of the regional, ship-borne Aegis BMD-system. Our calculations show that the almost complete coverage of Europe by three to six Aegis ships, is in principle possible. The Pentagon now plans the incremental deployment of a regional missile defense, based on sea- and land-based Aegis interceptors. This BMD-configuration allows reaching and possibly intercepting short- and medium-range BM of ranges up to 3,000 kilometers, both within and outside outer space.

10. Under this "European Phased Adaptive Approach" the U.S. will deploy the BMD systems Patriot, THAAD and Aegis which are **less powerful and less expensive** than the previous EMD system. Due to the lower interceptor velocities, in their current configuration these systems have no ability to intercept Russian ICBMs.

11. The testing records of the current Aegis SM-3 Block I interceptors appear to be technologically more sophisticated than those of the EMD interceptors. However, these tests have **not included any countermeasures**, so that the operability of the Aegis system under **realistic conditions** cannot be determined.

D. Global Missile Defense

12. In the longer term, it is the aim of the US administration to build a global network of mobile interceptors and sensors. Ground-based SM-3 interceptors will be deployed in Poland and Romania after 2015. In this decade the Aegis system can be equipped with a new more capable and faster interceptor (called the SM-3 Block II), developed together with Japan. According to the U.S., this system is also able to intercept ICBMs. Assuming that the Aegis system has the proposed reliability and ability to work under realistic conditions, it can, at least from the Russian and Chinese perspective, again **pose a threat to the strategic nuclear arsenals of both countries**. This would be a serious obstacle for further disarmament.

13. For **global arms control and disarmament** the massive deployment of interceptors would have a negative impact on the strategic stability between nuclear-weapon states. Russian and Chinese hard-liners would point to the emerging potential interception capabilities of globally deployed U.S. BMD systems, including a space sensor component and other BMD systems such as THAAD or the Airborne Laser. They would argue for the retention or expansion of their nuclear arsenals. This would affect other arms control treaties such as the Comprehensive Nuclear Test Ban Treaty (CTBT) or the cessation of production of fissile material (Fissile Material Cut-off Treaty, FMCT). The possible impact of missile defenses on massive nuclear weapon reductions and a nuclear weapon-free world will have to be studied in detail.

E. Final Conclusions for European Policy

14. At NATO's Lisbon summit on November 19 and 20, 2010, the leaders of the 28 member countries adopted a new "Strategic Concept" in which territorial missile defense "to defend NATO´s population and territories against BM attack" was approved as a core element of collective defense. NATO also offered Russia cooperation in this field. The NATO-Russia Council agreed to organize further studies and collaborations with Russia. **NATO has thus decided to start developments without determining the threat, the scope, the costs, the reliability and the technological maturity of the future NATO-**

BMD configuration. Not even a clear threat analysis is available. Without clear guidelines, however, neither the efficiency nor the potential effect of a BMD system can be evaluated. Many specific issues, such as questions of command and control, possible adverse effects at a launch or the impact on Global Zero are just as unclear as the extent of Russia's integration into a future European BMD system.

15. **Given the still unsolved technical challenges, the reliability of missile defense will not be guaranteed. Consequently, politicians and military will never rely completely on such a system.** This implies that diplomatic means, a common realistic threat assessment, improved early warning and effective arms export controls and regional arms control initiatives will continue to be necessary and should be expanded. This includes for example the reactivation and emphasis on the "Hague Code of Conduct".

16. The installation of an integrated European sensor and interception network in cooperation with NATO and with Russia may increase the **possibilities for joint cooperation** in the field of early warning and missile defense. However, details have so far not been elaborated and the public has no insight in the debate. A future system with Russia will have to be based on the development of suitable sensor systems (e.g. radar), the exchange of early warning informations and the appropriate choice of locations for the deployment of interceptors and sensors.