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Developments and Implications of Missile Defence

Gustav Lindstrom

GCSP

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Developments and Implications of Missile Defence

Gustav Lindstrom

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For further information, please contact:
Anne-Caroline Pissis, External Relations Manager: publications@gcsp.ch

Series Editor: Thierry Tardy

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Acknowledgements

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List of Acronyms

ALTBMD	Active Layered Theatre Ballistic Missile Defence
ABM	Anti-Ballistic Missile
BMD	Ballistic Missile Defence
BMDR	Ballistic Missile Defence Review
CD	Conference on Disarmament
EPAA	European Phased Adaptive Approach
FDFA	Federal Department of Foreign Affairs
GCSP	Geneva Centre for Security Policy
GGE	Governmental Group of Experts
ICBM	Inter-Continental Ballistic Missile
INF	Intermediate-Range Nuclear Forces
NATO	North Atlantic Treaty Organization
NPT	Nuclear Non-Proliferation Treaty
PAROS	Prevention of an Arms Race in Outer Space
PGMs	Precision-Guided Munitions
PPWT	Placement of Weapons in Outer Space and of the Threat of Use of Force Against Outer Space Objects
WMD	Weapons of Mass Destruction

Executive Summary

On 9 December 2011, the Geneva Centre for Security Policy (GCSP) hosted a seminar entitled "Developments and Implications of Missile Defence". The event was organized by the GCSP with the financial support of the Swiss Federal Department of Foreign Affairs (FDFA). About fifty participants attended the event, representing government, international organizations, the think tank community, and academia. The seminar had four principal aims. They were to:

- Examine recent developments in missile defence initiatives;
- Gauge the potential consequences of missile defence on regional and global security trends;
- Analyze the possible impact of missile defence developments on existing and future disarmament activities, including unintended consequences; and,
- Offer preliminary findings of key issues that policymakers should be aware of as missile defence evolves.

Four sessions tackled these issues and at least four key messages emerged from the discussions. First, there were divergences over the impact of the European Phased Adaptive Approach (EPAA) as it evolves. As the Obama Administration's new policy for missile defence of Europe, the EPAA represents the first step towards a more regional approach to missile defence that is based on proven technologies and can be adapted to changing threat perceptions. Several participants noted that the system was progressing well and in a transparent manner, with an initial operating capability reached in March 2010 when the USS Monterey was deployed to the Mediterranean Sea. Over time, the EPAA would result in a win-win situation for the United States, Russia, and NATO – especially if collaboration between the United States and Russia became feasible. Several other participants offered a different picture, arguing that the EPAA was evolving on an auto-pilot mode that would not necessarily adjust to changes in threat perceptions. Specifically, there was concern that the EPAA would go ahead with Phase III and IV regardless of the status of Iran's missile and nuclear programme. Such a trajectory would be of concern to Russia, raising questions over whom the system is targeted at.

Second, participants noted that missile defence programmes are developing beyond the Euro-Atlantic area. Such programmes exist for a variety of reasons, ranging from the need to boost security perceptions to acquiring advanced tech-

nological capabilities. Missile defence efforts are particularly noticeable in the Middle East and South Asia, where countries such as China, India, Japan, and Israel are pursuing different forms of missile defence. Policymakers overseeing such programmes will face a number of questions that are often difficult to evaluate or measure. Examples include: how defence systems might complement deterrence measures, especially when dealing with fragile and uncertain contexts; how defence systems may inadvertently contribute to an arms race; and whether maturing defence capabilities give rise to unattainable expectations.

Third, while there were diverging views on the impact of missile defence efforts on nuclear disarmament and proliferation, there was general agreement that missile defence may result in unintended consequences. Participants raised several examples. For instance, specific confidence-building measures such as de-alerting, de-targeting, and other elements related to the operational status of nuclear weapons could face a set-back if missile defence affects the balance between offensive and defensive weapons. Some participants raised concerns over the possible weaponisation of space as long-range interceptors could theoretically be used to target satellites in space.

Fourth, missile defence will continue to be driven by technological advances. As such, it will gradually evolve into an effective technology against rudimentary threats. However, this does not exclude specific countries with advanced nuclear deterrents that might feel impacted. Participants discussed at large whether or not Russia's nuclear deterrent would be affected when the EPAA reaches the fourth phase – with many arguing that it would not. While there was no agreement, several participants also noted that China could, in the medium to long term, be more impacted by missile defence than Russia.

Missile Defence Initiatives: Current Status and Milestones

The first session focused on the current state of play of the European Phased Adaptive Approach (EPAA) and its integration into NATO's ballistic missile defence architecture. These developments were examined from US, Russian, and NATO perspectives.

Background

The EPAA was announced by the Obama Administration in September 2009. It is based on the findings of the first-ever Ballistic Missile Defence Review (BMDR) carried out from March 2009 to January 2010.[1] According to the BMDR, the ballistic missile threat is increasing both quantitatively and qualitatively. Of particular concern are developments in the Middle East and South East Asia. Examples of missile proliferators identified by the participants included Syria, Hezbollah, Iran, and North Korea. Iran's pursuit of a long-range missile capacity was identified to be of particular concern. Beyond protecting the United States and its allies against a planned attack, the EPAA could play a useful role in the case of an accidental missile launch.

The EPAA is being pursued in a transparent manner and its intention is to establish an adaptive and mobile defence capability. The system is being developed over four phases and relies extensively on BMD-capable Aegis ships equipped with Standard Missile 3 (SM-3) interceptors and ground-based advanced radars (AN/TPY-2). Phase I aims to address short- and medium-range ballistic missiles. It achieved an initial operating capability in March 2010 when the USS Monterey was deployed to the Mediterranean Sea. In the summer 2011, Phase I achieved an additional milestone when Turkey agreed to host a land-based early warning radar on its territory.

Phase II, with a 2015 timeframe, will extend the coverage against short- and medium-range ballistic missiles, primarily through the deployment of a more advanced SM-3 interceptor (Block IB). In December 2011, Romania ratified the

1 For more information, see "Ballistic Missile Defence Review Report", US Department of Defence, February 2010. Available at http://www.defense.gov/bmdr/docs/BMDR%20as%20of%2026JAN10%200630_for%20web.pdf

US-Romanian Ballistic Missile Defence Agreement which will allow the United States to build and operate a land-based site in Romania. Phase III will include a land-based SM-3 site in Poland, based on an agreement signed in September 2011. With a 2018 timeframe, Phase III will also deploy a more advanced SM-3 (Block IIA) interceptor to enhance protection against medium- and intermediate range-missile threats. Phase IV, to be reached around 2020, aims to protect against medium- and intermediate-range missiles as well as early generation Inter-Continental Ballistic Missiles (ICBMs). Beyond an upgraded missile defence command and control system, Phase IV will deploy an increasingly advanced interceptor, the SM-3 Block IIB.

The US View

From a US perspective, the EPAA represents a "win-win-win" situation for the United States, Russia, and NATO. According to a participant, cooperation between the United States and Russia on missile defence provides benefits across four dimensions:

- Military: a combination of US and Russian sensors would enhance capabilities to protect against threats stemming from countries such as Iran;
- Political: by presenting a united front on missile defence, the United States, Russia, and NATO would send a strong signal to other nations that missile proliferation is not in their best interest;
- Transparency: collaboration would give Russia extensive insights into NATO's missile defence architecture and technology;
- Strategic stability: strengthened bilateral co-operation between the United States and Russia could facilitate the exertion of pressure on Iran. Besides signalling that the policy of "mutually assured destruction" no longer serves as a pillar in US-Russian relations, it would help compel Iran to decrease its efforts to acquire long-range missiles.

A suggested way forward was to build on the significant number of productive meetings already held between senior US and Russian officials, including at the level of Secretary/Minister of Defence and Secretary of State/Minister of Foreign Affairs. Existing initiatives, such as the Russian proposal for a missile defence centre, could gain foothold by sharing sensor data. Russia could also observe future missile defence tests to reinforce the notion that the EPAA does not impact Russia's nuclear deterrent. Several participants underlined that the EPAA is not directed at Russia.

However, it was recognized that the United States has important caveats to such missile defence co-operation. For example, the United States does not accept delegating authority to a non-NATO state to protect NATO members from

incoming ballistic missiles or accept any limitations to the proposed development of the EPAA. Participants also noted that there are important actors in the United States and Russia who do not have a vested interest in seeing US-Russian co-operation in missile defence. These will act as spoilers to co-operation whenever possible.

The Russian Perspective

From a Russian perspective, missile defence is more than a military technology project. It contains economic, political, and ideological dimensions that spur competition between the "haves" and the "have-nots". According to a participant, the US-NATO efforts to achieve missile defence could be likened to a dogma that is not open to outside suggestions. To illustrate, there is a Russian perception that the EPAA will go ahead with Phase III and IV regardless of the status of Iran's missile and nuclear programme – reinforcing the notion that there is little others can do to influence its course. Several Russian participants pointed to this issue, arguing that missile defence should be proportional to the threat. In response, other participants argued that missile defence probably would be curtailed if the threat from Iran and North Korea diminishes or disappears. A participant observed that the United States had already shut down a previously operational missile defence system (the Safeguard Anti-Ballistic Missile system (ABM) in North Dakota built in the late 1960s), demonstrating that missile defence components could be terminated. In response, another participant noted that the system had been terminated because it was deemed ineffective rather than from the notion of a changed threat perception.

The Russian perception of missile defence has also changed over time. The EPAA was initially seen as a project to boost NATO's ability to protect Southern Europe. Russia was comfortable with this idea and President Medvedev was open to collaboration and the sharing of expertise. Russia proposed that the United States and Russia create overlapping sectors of responsibility, in which both countries would have an equal footing under a common system, effectively boosting US-Russian co-operation. According to a participant, the Russian proposal was flatly rejected as NATO was not willing to entrust or outsource its security to a non-NATO country.

As a response to NATO's rejection, and as a measure to protect its own territory, Russia concluded that any NATO missile defence system should not operate over Russian space or any other territory that did not directly request it. According to a Russian participant, this idea was not well received by the United States as it was seen to put limits on the EPAA, effectively crossing a red line for US policymakers.

The current Russian perception is that the United States is building a global missile defence system. This evolutionary system is likely to impact Russian capabilities in the medium to long term. To illustrate, the future land-based SM-3 site in Poland, combined with the possible presence of US ships in the northern European seas could pose a threat to Russia. A participant pointed out that there would be nothing stopping the United States from deploying 90+ destroyers and cruisers with SM-3 interceptors around Arctic waters. As such, several participants wondered how many interceptors the United States would build and whether or not there should be limits on their number. They called for more transparency on the part of the United States. Another participant estimated that given the number of Aegis ships, the United States might end up with approximately 1,000 SM-3 missiles – a number of concern to Russians.

A participant portrayed on-going missile defence efforts as "a new Maginot line" that will end up providing a false sense of security. Those who are keen to attack the United States and its allies will find alternative ways to bypass a missile defence shield. Furthermore, the focus on missile defence is misdirected as it is merely represents a delivery vehicle. A participant argued that policymakers should be concerned about the payloads rather than the missiles; of greatest concern being Weapons of Mass Destruction (WMD). The emphasis should thus be at addressing proliferation. If not, there is a risk that money is drained to the military-industrial complex while adversely affecting the US-Russian relationship.

Russian policymakers would like to receive assurances that the EPAA is not targeted at them. Invitations to observe missile defence tests are considered insufficient, especially when telemetric components – e.g. those needed to measure velocity and height – are banned by the US Senate. According to a participant, Russia was invited to observe three tests with a ban on telemetric equipment. These observations did not yield much information "as you cannot gather valuable information with binoculars". In response, another participant noted that the US interceptors are very sensitive and the attachment of additional instruments would likely impact their performance. Specifically, a piece of telemetry is likely to weigh between five and ten kilos, which would affect the interceptors' balance (even though it should work to verify the interceptors' speed). An alternative option might be for Russia to bring along its own verification radars.

If no tangible evidence can be provided, Russia would like to receive a legally binding guarantee that the EPAA is not targeted at Russia. According to several participants, there is now a perception in Russia that such guarantees will not be forthcoming given the Senate's refusal. The US response that Russia should trust the nature of US missile defence efforts reinforces this perception. Russian concern was captured in President Medvedev's speech on missile defence deliv-

ered in late November 2011. According to Medvedev, Russia would engage in a "phased adaptive response" should US-Russian co-operation efforts fail – including the deployment of military hardware to strategic locations. While many saw Medvedev's statements as a message destined for domestic consumption in advance of the 2012 Russian Presidential elections, it was underlined that it was principally targeted to an external audience.

The NATO Perspective

From NATO's perspective, there are limits to what the Alliance can do to promote US-Russian co-operation on missile defence. A bilateral agreement is seen as a key ingredient to ensure such co-operation. Since the November 2010 Lisbon Summit, NATO has focused on the harmonization of command-and-control assets which will form the backbone of the Active Layered Theatre Ballistic Missile Defence (ALTBMD) System capability. In June 2011, Defence Ministers approved the NATO ballistic missile defence action plan which provides a roadmap of the key actions and Council decisions needed for the implementation of missile defence over the next decade. The European contribution is mainly focusing on theatre ballistic defence, and the Alliance aims to declare an interim capability at the upcoming May 2012 NATO Chicago Summit. With respect to the Summit itself, some participants believe it should provide an opportunity to re-ignite co-operative efforts, especially if a political statement could be adopted.

With respect to the NATO-Russian track of work, progress has been average. Two taskings have been made since the November 2010 NATO-Russia Council Summit, a principal component being the development of a comprehensive joint analysis of the future framework for BMD cooperation. A participant identified additional areas for consideration such as the establishment of a joint data fusion centre, the organization of a joint field-and-command post exercise, and the exploration of joint technical development projects. It was recognized that 50 years of Cold War thinking are unlikely to disappear overnight so there is a need for strategic persistence. A key task is to build confidence, even if it can take years to construct and can disappear in a matter of weeks. A participant noted that a key step is for Russia to overcome its missile defence phobia and paranoia while the United States needs to enter a Russian frame of mind to understand their concerns.

It was also recognized that political overtones will continue to influence the prospects for missile defence co-operation. In Russia, there is concern over the expansion of NATO to incorporate territories of the former Soviet Union. Particularly worrying in Russian eyes is the possibility that Georgia and Ukraine might accede to NATO but the concerns do not stop there. A strong theme in

Russian thinking also concerns what is seen as the illegitimate use of NATO military power in several regions of the world – with Kosovo and Libya being the most recent examples. On the NATO side, there are worries about the real character of the current Russian state and political elite, not helped by reported irregularities in the December 2011 elections to the Duma. There are also worries about the use of Russian energy supplies and military power to intimidate states in the east of Europe, fears that are especially strong among the newer member states of NATO. The Russian military action in Georgia, threats to deploy missiles to Kaliningrad and the cutting off of energy supplies to Ukraine and others are all examples that feature in this line of reasoning.

Regional and Global Security Implications of Missile Defence

The United States and NATO are not the only actors going forward with the development of missile defence capabilities. Programmes exist in several countries, effectively raising concerns beyond the Euro-Atlantic area. At least five factors explain the development of new weapons capabilities or missile defence systems at the regional level:

- A frequent quest by states for greater security in their neighbourhood;
- The presence of domestic pressure as a driver for new defence programs (e.g. to stimulate job creation and industry);
- A desire to acquire advanced technological capabilities;
- Frequent economic pressures to engage in large-scale projects, such as missile defence, to promote economies of scale; and,
- The existence of old and new paradigms (e.g. those that recognize the link between nuclear weapons and missile defence) that encourage missile defence initiatives.

Regional Developments

Missile defence efforts are currently ongoing in several parts of the world – primarily in the Middle East and South Asia. For example, Japan, India, China and Israel are presently pursuing or examining missile defence.

India became interested in missile defence at the end of the 1990s, in the aftermath of the Kargil conflict and its decision to build nuclear weapons. Its focus is on providing air defence capabilities to protect the nuclear command authority headquartered in New Delhi. As such, India's missile defence programme does not cover the whole Indian territory. The system relies on the Prithvi Air Defence missile for high-altitude interception and the Advanced Air Defence Missile for low-altitude interception. This two-tiered missile defence system focuses primarily on the mid-course and terminal stages of incoming missiles. Looking ahead, India aims to extend the range of its interceptors. In the first phase, with an initial operating capability expected in 2012, India aims to have interceptors with a range of 2,000 kilometres. In a second phase, the range will be extended to 5,000 kilometres. With respect to tracking technology, India has collaborated with Israel on a new early warning radar (Swordfish).

Concerning China, its missile defence programme is evolving gradually and there is limited information concerning its status and capability. Chinese policymakers believe that every country has a right to protect its citizens, but how this is to be achieved needs to be carefully considered. Accordingly, Chinese policymakers tend to see missile defence as undercutting mutual trust between countries. It is also perceived to weaken Chinese nuclear deterrence and stimulate arms races which in time might spill over to outer space.

For these reasons, China opposes missile defence efforts that are perceived to negatively impact international stability. With respect to South Asia, China sees the development and deployment of missile defence as a step towards political and military blocks. China is against such a trend and would in particular strongly oppose missile defence efforts around Taiwan. To ensure continued co-operation, China places an emphasis on dialogue and steady efforts towards nuclear disarmament. With respect to overall missile defence efforts in South Asia, participants noted that there currently is no system in place to counter drones or cruise missiles. And while missile defence is there to stay, one of the most challenging aspects for the future is whether missile defence should be tackled bilaterally, multilaterally, or in a parallel fashion across the region.

Participants also explored the evolution of missile defence in Israel over the past two decades. Unlike many other systems, its technological development preceded its conceptual evolution – emerging from a modest capability to become a central pillar of Israeli security. Its evolution has been civilian rather than military-driven – focusing on a range of threats including short-range rockets (e.g. via the Iron Dome system), cruise missiles, unmanned aerial vehicles, and missiles of improving accuracy and range.

Similar to other states engaging in missile defence, Israel faces several key dilemmas with respect to its practical implementation. Examples of issues that are under frequent evaluation include:

- The level of resource allocation towards missile defence (offence versus defence);
- The source of funding (e.g. what proportion should be covered by the Treasury Department, the Ministry of Defence, the United States?);
- Whether it should protect population or strategic assets?
- Whether it should offer equal level of protection?
- Who decides on its application?
- Whether it should operate in peacetime or solely in wartime?
- Who should it protect against?
- How to operationally manage co-existence with offensive assets?
- Whether it is strengthening or weakening deterrence?

Key Issues Underlying Missile Defence Developments

Overall, missile defence systems also accompanied by a set of implications that are often difficult to evaluate or measure. Examples include:

- The ability of missile defence systems to facilitate restraint in the face of aggression;
- How defence systems complement deterrence measures, especially when dealing with fragile, uncertain contexts;
- The degree to which missile defence systems play an important role in reassuring citizens;
- How defence systems may inadvertently contribute to an arms race;
- Whether maturing defence capabilities give rise to unattainable expectations.

It was noted that missile defence raises as many questions as its answers. Overall, it has come of age in many parts of the world by reaching an operational capability and becoming an indispensable component for security. However, it is no panacea or overall solution, and policymakers will continue to need to reflect on the stabilising and destabilising effects of missile defence in regional settings.

Potential Consequences of Missile Defence on Nuclear Disarmament and Non-Proliferation (Including Unintended Consequences)

There were diverging views on the impact of missile defence on nuclear disarmament and non-proliferation. At one end were those who thought that missile defence does not complicate disarmament or non-proliferation efforts. Counter intuitively, missile defence can in some cases enhance non-proliferation by discouraging certain nations from pursuing long-range ballistic missiles or engaging in regional arms races. On the other hand, several participants argued that missile defence has a clear impact on nuclear disarmament and non-proliferation.

Disarmament Considerations

According to some participants, a careful review of the physics and geometry of the EPAA shows that it does not affect Russian nuclear arsenals. Its interceptor deployments are placed where they can best deal with threats originating from the Middle East, as evidenced by the fact that first-acquisition radar systems do not have the ability to pick up where major Russian (ICBMs) regiments are located. As a result, there was confidence that important disarmament treaties such as New START would find their footing and move ahead as foreseen.

Missile defence could also provide a benefit in the future, especially in the event countries move towards a world free of nuclear weapons in support of a Global Zero. Under such a scenario, missile defence could protect against would-be "cheaters" or countries with undeclared "break-out" capabilities. A participant argued that missile defence might become an indispensable component to facilitate Global Zero and/or promote substantial nuclear disarmament.

Concerning possible impacts on disarmament, several issues were raised. Some participants argued that missile defence has a clear impact on nuclear disarmament and non-proliferation. For example, the preamble of the New START Treaty identifies a relationship between defensive and offensive weapons systems. Given this linkage, the defensive nature of missile defence is likely to impact other countries' offensive capabilities, encouraging them to consider steps to adapt.

A participant made reference to the 13 Practical Steps Toward Nuclear Disarmament and how these are still relevant today having been reaffirmed at the 2010 Nuclear Non-Proliferation Treaty (NPT) Review Conference. The participant highlighted Step Seven which calls for the early entry into force and full implementation of START II; the conclusion of START III; and preservation and strengthening of the ABM Treaty as a basis for further reductions of strategic offensive weapons. The lack of progress in this step, compounded by continued progress on missile defence, could complicate progress in the area of disarmament.

Participants also identified possible "unintended consequences" of missile defence. For example, specific confidence-building measures such as de-alerting, de-targeting, and other elements related to the operational status of nuclear weapons could face a set-back if missile defence affects the balance between offensive and defensive weapons. Another unintended consequence might be a greater push by some countries, such as Iran, towards the procurement of cruise missiles. Cruise missiles might become increasingly attractive weapons as they have low-signature targets and relatively cool exhausts – effectively challenging the defence capacity of missile defence. What would happen if several countries pick-up on this and encourage a new type of arms race? In response to this issue, a participant noted that policymakers are aware of the challenge posed by cruise missiles and that these would be dealt with at some point in the future.

In light of this discussion, participants offered some ideas and recommendations for how to promote on-going disarmament and non-proliferation efforts. One suggestion was to explore whether or not the Intermediate-Range Nuclear Forces Treaty (INF) signed in 1987 between the United States and the-then Soviet Union could be revived and "multilateralized", so more countries would be discouraged to hold or build nuclear and conventional intermediate range ground-launched ballistic and cruise missiles. A participant made the observation that medium-range ballistic missiles located in the Middle East could reach Russia but not the United States, effectively impacting Russia more than the United States. In this vein, several participants also made the case that more consideration should be given to multilateralizing talks which to date have been pursued bilaterally. Overall, more political and economic solutions (and fewer military measures) should be identified to counter missile proliferation.

Outer Space Dimension

Some participants also raised concerns over the possible weaponisation of space. Long-range interceptors, especially those designed for mid-course interception, could theoretically be used to target satellites in space. As a result, countries may take measures to protect their space-based assets. Such protection may at some

point also include the positioning of weapons in space. According to a participant, some nations have already carried out table-top exercises that include the use of weapons in space. Another participant toned down the prospects for a weaponisation of space, arguing that it would be more reasonable to expect a greater number of sophisticated sensors in space.

Efforts to promote arms control in space, e.g. via the Prevention of an Arms Race in Outer Space (PAROS) item on the agenda of the Conference on Disarmament (CD) or the draft treaty on the Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects (PPWT), have not gained foothold as some countries have abstained or voted against them in the UN General Assembly or resist negotiation in the CD. Perhaps some indication of progress may be visible in the forthcoming 2013 study by the Governmental Group of Experts (GGE) examining outer space transparency and confidence-building measures.

Issues for Future Consideration

The discussions in the last session focused on two principal aspects: future approaches to missile defence and the impact of advances in missile defence technology.

Approach to Missile Defence

It was noted that the European approach to BMD is somewhat inconsistent, complicating a coherent execution of the NATO strategy for missile defence. To illustrate, in September 2011, both France's Foreign Minister and the German Defence Minister had meetings with Russian officials regarding the missile defence shield. While the former declared that NATO would give Russia the legal guarantees it is seeking to the effect that the NATO BMD system would never be used against Russia, the latter committed to no such thing. As this example illustrates, NATO countries have not been talking to Russia with one voice. These differences among the European NATO members have prevented efficient and coherent negotiations with Russia.

Some states have also been pursuing their own bilateral relations with the United States with respect to setting up the BMD infrastructure in Europe. As a result, there is discrepancy between what is decided in the NATO framework and what is actually being pursued in national European foreign policies, and some of the bilateral deals being struck with the United States are helping to alienate Russia. The US-Romanian Ballistic Missile Defence Agreement signed in September 2011, for example, envisions neither co-operation with Russia – in the form of joint missile defence collaboration between separate systems – nor does it take into account the fact that certain Russian concerns have not yet been addressed.

Several participants argued that there will be on-going discussions on what kind of security architecture should be developed to address evolving security threats. A couple of participants argued that there had been a failure to produce a post-Cold War paradigm in the area of disarmament and non-proliferation. To illustrate, a participant noted how many of the treaties created during the Cold War are either gone (e.g. the Anti-Ballistic Missile Treaty), in serious decline (e.g. the Treaty on Conventional Armed Forces in Europe), or remain in limbo

(e.g. the Comprehensive Test Ban Treaty). One of the elements still standing was the INF Treaty, which as discussed earlier, could play a more vibrant role if it was multilateralized.

Impact of Advances in Technology

Missile defence will continue to be driven by technological advances. It will gradually evolve into an effective technology against rudimentary threats. Some foresee its evolution will produce effects similar to those of Precision-Guided Munitions (PGMs). With the advent of PGMs, conventional warfare was impacted, especially the balance between offensive and defensive weapons. It also spawned developments in other areas such as sensors. NATO's BMD for the protection of NATO European territory, populations and forces is likely to follow such a path, even if it is unlikely to pose a serious threat to Russia. The only elements that could pose a threat to Russia would be ground-based interceptors, but there are currently very few of these off the coast of the United States. Some participants disagreed with this analysis, with one specifically noting that Russia would be very worried at Phase IV and with follow-on improvements in infrastructures.

To relieve Russian concerns, a participant noted that the SM-3 interceptors in Poland would need a speed greater than 6 kilometres per second (km/s) to reach Russian ICBMs. If based in the Baltic Sea, in the Arctic Sea, or around Iceland, the interceptors would have to travel in excess of 5 km/s to intercept incoming ballistic missiles. Only by locating interceptors off the coast of the United States or Canada would they be able to reach Russian or Chinese ICBMs or submarine-launched ballistic missiles. The current generation of SM-3 missiles (IA) has a speed of 3 km/s and it will not be until the third phase that the SM-3 interceptor approaches 5 km/s. With respect to SM-3 (IIB) foreseen in Phase IV, nobody can tell with certainty what top speed might be achieved as the interceptor is still on the drawing board. Even if it would reach speeds in excess of 5 km/s, a participant predicted that the United States would at most procure 100-200 such missiles, far below the number necessary to impact Russia's nuclear deterrent. It would, however, have implications for China and its nuclear arsenals. Several participants noted that China could, in the medium to long-term, be impacted more by missile defence than Russia.

One of the principal constraints to the future of missile defence is the financing available to support its development. To date, missile defence has cost billions of dollars, and even if development costs are decreasing over time, shrinking defence budgets may slow down the progress of EPAA (and by definition, NATO's evolving ballistic missile defence architecture). A participant underscored that the total costs of EPAA and ALTBMD were relatively modest when compared

to other missile defence efforts such as the Strategic Defence Initiative and the Bush Administration's Ground-Based Midcourse Defence. To date, the EPAA has cost approximately USD 2 billion while NATO's ALTBMD expenditures amount to roughly USD 1 billion. In spite of these numbers, a participant doubted that the European public, in the current economic environment, would perceive a threat to Europe from Iran or elsewhere as sufficiently great to warrant the investment required in BMD.

Seminar Programme

Friday, 9 December 2011

Welcoming Remarks	Ambassador Fred Tanner, Director, GCSP
Opening remarks	Mr Kassym-Jomart Tokayev, Director-General, United Nations Office at Geneva

Session 1: Missile Defence Initiatives: Current Status and Milestones

Chair	Ambassador Fred Tanner, Director, GCSP
Speakers	Ambassador Dmitry Rogozin, Special Envoy of the President for Interaction with NATO in Missile Defence, Head of the Permanent Mission of Russia to NATO, Brussels Dr John Plumb, Principal Director, Nuclear and Missile Defence Policy, US Department of Defence, Washington, D.C. Mr Roberto Zadra, Head of NATO's Ballistic Missile Defence Section, Defence Investment Division, NATO HQ, Brussels

Session 2: Regional and Global Security Implications of Missile Defence

Chair	Mr Jarmo Sareva, Deputy Secretary-General of the Conference on Disarmament, United Nations Office at Geneva
Speakers	Dr Pal Sidhu, Visiting Fellow on Disarmament, GCSP; Senior Fellow, Center on International Cooperation, New York University Dr Ariel Levite, Non Resident Senior Associate, Carnegie Endowment for International Peace Ambassador Wu Haitao, Deputy Permanent Representative, Permanent Mission of the People's Republic of China, Geneva
Lunch Address	Ambassador Georges Martin, Deputy State Secretary and Head of the Division for Security Policy and Crisis Management of the Federal Department of Foreign Affairs (FDFA)

Session 3: Potential Consequences of Missile Defence on Nuclear Disarmament and Non-Proliferation (incl. unintended consequences)

Chair Dr Oliver Thränert, Senior Fellow, Arms Control, Disarmament, Non-proliferation, Missile Defence, German Institute for International and Security Affairs, Berlin

Speakers Mr Walter Reid, Deputy Permanent Representative, Permanent Mission of the United States to the Conference on Disarmament, Geneva
Mr Victor Vasiliev, Deputy Permanent Representative, Permanent Mission of the Russian Federation to the United Nations in Geneva

Session 4: Issues for Future Consideration

Chair Dr Gustav Lindstrom, Head of the Euro-Atlantic Security Programme, GCSP

Speakers Rt Hon Lord Des Browne, Former UK Defence Secretary, Convenor of the Top Level Group of UK Parliamentarians for Nuclear Disarmament and Non-Proliferation, London
Dr Sergey M. Rogov, Director, Institute for the United States and Canadian Studies, Moscow
Dr Dean Wilkening, Senior Research Scientist, Center for International Security and Cooperation, Stanford University, Palo Alto

List of Participants

Dr David C. Atwood, Consultant, former Director and Representative for Disarmament and Peace at Quaker United Nations Office in Geneva

Dr Vladimir Baranovsky, Deputy Director, Institute of World Economy and International Relations (IMEMO), Moscow

Mr Petro Beshta, Deputy Permanent Representative, Permanent Mission of Ukraine to the UN, Geneva

Rt Hon Lord Des Browne, Former UK Defence Secretary, Convenor of the Top Level Group of Parliamentarians for Nuclear Disarmament and Non-Proliferation, London

Colonel Jeffrey Burchfield, Chief, Missile Defence Division, EUCOM J5-MD, Headquarters, US European Command

Mr Sergey Fedosov, Senior Counsellor, Permanent Mission of the Russian Federation to the UN, Geneva

Mr Marc Finaud, Special Advisor to the Director, GCSP

Mr Andreas Friedrich, Head, Arms Control and Disarmament Section, Division for Security Policy and Crisis Management, Swiss Federal Department of Foreign Affairs (FDFA)

Dr Marcel Gerber, Policy Adviser, General Secretariat – Security Policy, Swiss Federal Department of Defence, Civil Protection and Sport (DDPS)

Mr Vitaly Golitsyn, Third Secretary, Permanent Mission of Russia to NATO, Brussels

Mr Bruno Gruselle, Senior Research Fellow, Fondation pour la recherche stratégique, Paris

Dr Theresa Hitchens, Director, UNIDIR, Geneva

Dr Ian Kearns, Chief Executive, European Leadership Network (ELN) for Multilateral Nuclear Disarmament and Non-Proliferation, London

Mr Shafqat Ali Khan, Deputy Permanent Representative, Permanent Mission of the Islamic Republic of Pakistan, Geneva

Dr Shannon N. Kile, Senior Researcher, Stockholm International Peace Research Institute (SIPRI), Stockholm

Ms Olga Kuznetsova, First Secretary, Permanent Mission of the Russian Federation to the UN, Geneva

Dr Bernd Kubbig, Senior Research Fellow, Peace Research Institute Frankfurt

Mr Thierry Legendre, Special Advisor, Ministry of Defence of Denmark, Copenhagen

Dr Ariel Levite, Non Resident Senior Associate, Carnegie Endowment for International Peace

Dr Gustav Lindstrom, Head of the Euro-Atlantic Security Programme, GCSP

Ambassador Georges Martin, Deputy State Secretary and Head of the Division for Security Policy and Crisis Management of the Federal Department of Foreign Affairs (FDFA)

Mr Laurent Masmejean, Senior Policy Officer, Arms Control and Disarmament Section, Division for Security Policy and Crisis Management, Swiss Federal Department of Foreign Affairs (FDFA)

Mr Konstantin Mikhalkin, First Secretary, Permanent Mission of the Russian Federation to the UN, Geneva

Mr Chihiro Mochizuki, First Secretary, Permanent Mission of Japan to the Conference on Disarmament, Geneva

Ambassador Yuri Nazarkin, former Chief Negotiator on START, Professor at the Geneva School for Diplomacy

Dr Götz Neuneck, Deputy Director, Institute for Peace Research and Security Policy, University of Hamburg, Hamburg

Mr Piotr Pacholski, Director, Missile Defence Bureau, Ministry of National Defence, Warsaw

Dr John Plumb, Principal Director, Nuclear and Missile Defence Policy, Office of the Under Secretary of Defence for Policy, US Department of Defence

Ms Tamar Rahamimoff Honig, Representative to the Conference on Disarmament, Permanent Mission of Israel, Geneva

Mr Walter Reid, Deputy Permanent Representative, Permanent Mission of the United States of America to the Conference on Disarmament, Geneva

Ambassador Dmitry Rogozin, Special Envoy of the President for Interaction with NATO in Missile Defence, Head of the Permanent Mission of Russia to NATO, Brussels

Dr Sergey M. Rogov, Director, Institute for the US and Canadian Studies, Moscow

Dr Natalia Rogova, Senior Researcher, Institute for the US and Canadian Studies, Moscow

Mr Jarmo Sareva, Deputy Secretary-General of the Conference on Disarmament, United Nations Office at Geneva

Prof Dr Martin Senn, Lecturer in International Security, University of Innsbruck

Dr Valery Semin, Senior Counsellor, Permanent Mission of Russia to NATO, Brussels

Dr Pal Sidhu, Visiting Fellow on Disarmament, GCSP, and Senior Fellow, Center on International Cooperation, New York University

Mr Shen Jian, Deputy Permanent Representative to the Conference on Disarmament, Permanent Mission of the People's Republic of China, Geneva

Mr Oleg Shulga, Consultant on Disarmament Issues, Moscow

Ambassador Fred Tanner, Director, GCSP

Dr Oliver Thränert, Senior Fellow, Arms Control, Disarmament, Non-proliferation, Missile Defence, German Institute for International and Security Affairs, Berlin

Mr Kassym-Jomart Tokayev, Director-General, United Nations Office at Geneva

Mr Victor Vasiliev, Deputy Permanent Representative, Permanent Mission of the Russian Federation, Geneva

Dr Dean Wilkening, Senior Research Scientist, Center for International Security and Cooperation, Stanford University, Palo Alto (California)

Ambassador Wu Haitao, Deputy Permanent Representative, Permanent Mission of the People's Republic of China, Geneva

Mr Wu Jianjian, Second Secretary, Permanent Mission of the People's Republic of China, Geneva

Mr Xie Xinxing, Attaché, Permanent Mission of the People's Republic of China, Geneva

Col (ret.) Valery Yarynich, Leading fellow, Institute for the US and Canadian Studies, Moscow

Mr Roberto Zadra, Head of NATO's Ballistic Missile Defence Section, Defence Investment Division, NATO HQ, Brussels

Mr Zou Zhibo, Counsellor on Disarmament Issues, Permanent Mission of the People's Republic of China, Geneva

Ms Anna Zotova, Research Assistant, Geneva Centre for the Democratic Control of Armed Forces (DCAF)

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GCSP
avenue de la Paix 7bis
P.O. Box 1295
CH - 1211 Geneva 1
T +41 22 906 16 00
F +41 22 906 16 49
info@gcsp.ch
www.gcsp.ch

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Geneva Centre for Security Policy
Centre de Politique de Sécurité, Genève
Genfer Zentrum für Sicherheitspolitik

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