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Assessing the reasons for a US Ballistic Missile Defence

An assessment of the current ballistic missile threat to the United States and the US policy under the Presidency of George W. Bush

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1. Introduction

> "Today, the United States and Russia face new threats to their security. Principal among these threats are weapons of mass destruction and their delivery means wielded by terrorists and rogue states. A number of such states are acquiring increasingly longer-range ballistic missiles as instruments of blackmail and coercion against the United States and its friends and allies. The United States must defend its homeland, its forces and its friends and allies against these threats. We must develop and deploy the means to deter and protect against them, including through limited missile defense of our territory."[1]

This is a part of the White House announcement for the United States (US) withdrawal from the Anti-Ballistic Missile Treaty (ABM)[2] on the 13th of December 2001. The withdrawal was necessary because shortly after the terrorist attacks on the 11th of September 2001 on the World Trade Center in New York and the Pentagon, the US administration perceives one of its greatest danger coming from the combination of the proliferation of weapons of mass destruction (WMD) and ballistic missiles[3], in the hands of 'rogue states'[4] and terrorist groups. The installation of a missile defence would have been in violation with the treaty commitment.

However, the idea of a ballistic missile defence (BMD) reaches back to the Strategic Defense Initiative (SDI)[5] announcement by president Ronald Regan on the 23rd of March 1983. Even after the end of the Cold War the perception remained that a missile defence is necessary. After the "a new world order" announcement by president George Bush Senior, SDI was reviewed. As a result, the need for a missile defence capability remained, even after the collapse of the Soviet Union. But the focus shifted. During the Cold War a missile defence was needed to destroy soviet long-range ballistic missiles, after the experience of the Gulf war in 1990 – 1991, where Saddam Hussein shot several ballistic missiles against Israel and Saudi Arabia, missile defence is needed to protect deployed forces abroad and valuable installations against short and medium range ballistic missiles. In accordance to that, US Secretary of Defence Les Aspin renamed the Strategic Defense Initiative Organization on the 13th May 1993 to Ballistic Missile Defense Organization (BMDO). Since then, the development of sensors and effectors in order to build a ballistic mis-

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1 From the Statement by the White House Press Secretary Announcement of Withdrawal from the ABM Treaty, <http://www.state.gov/t/ac/rls/fs/2001/6848.htm>, (07.12.07).

2 Treaty bewtween the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems: <http://www.state.gov/www/global/arms/treaties/abm/abm2.html>, (07.12.07).

3 In order to avoid inaccuracies, I will use the term missile for ballistic missile and address cruise missiles in their full length.

4 Rogue States are defined by the US in the National Security Strategy of the United States of America (NSS) of 2002 as follows: „In the 1990s we witnessed the emergence of a small number of rogue states that, while different in important ways, share a number of attributes. These states: brutalize their own people and squander their national resources for the personal gain of the rulers; display no regard for international law, threaten their neighbors, and callously violate international treaties to which they are party; are determined to acquire weapons of mass destruction, along with other advanced military technology, to be used as threats or offensively to achieve the aggressive designs of these regimes; sponsor terrorism around the globe; and reject basic human values and hate the United States and everything for which it stands." The US NSS 2002, chapter V: <http://www.whitehouse.gov/nsc/nss5.html>, (07.12.07)

5 For further details on SDI: <http://www.fas.org/nuke/space/c06sdi_1.htm>, (07.12.07)

sile defence capability continues with shifting priorities and funding under different administrations.[6]

The current US administration sees a high priority in the missile defence project. It is argued that the reason for its necessity is the ongoing proliferation of missile technology and knowledge about the production of weapon of mass destruction, especially among rogue states and non-state actors supported by those states. It is also argued that ballistic missile defence supports non-proliferation policies and therefore provides a non-proliferation tool and an active defence against this threat.[7]

This essay will critically discuss whether a ballistic missile defence can fulfil the assumed tasks, providing an essential tool to counter current threats to the US. Therefore, it will provide a short technical introduction to ballistic missile defence. After that, it shows how the current US administration justifies its support for the development and deployment of a ballistic missile defence. In a next step two state sources of potential threats, Iran and North Korea, and Hezbollah, as one non-state source of concern are reviewed regarding their capabilities to threaten the US, its friends and allies. Finally, it will be discussed whether ballistic missile defence provides a proper tool to counter these security threats. The conclusion will then offer an evaluation of arguments and a decision whether the arguments in favour of a missile defence system really addresses current US security.

2. The current status of the US ballistic missile defence system – a short introduction

There are two different aspects of ballistic missile defence. One is the protection of deployed forces abroad or high value installations, within a defined area. This is referred to as theatre missile defence[8]. The broader headline - ballistic missile defence - includes the protection of whole states and regions against limited ballistic missile attacks, which represent the second aspect.

Surface to surface ballistic missiles are categorised by their range. Missiles with a range up to 600km are defined as short-range ballistic missiles (SRBM)[9]. Medium range ballistic missiles

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6 US Departement of Defense, Missile Defense Agency: History of Ballistic Missile Defense, <http://www.mda.mil/mdalink/html/history.html>, (07.12.07).

7 William Schneider Jr.: Missile Defence as an Instrument of Non-Proliferation Policy, in: Robin Ranger, David Wiencek, Jeremy Stocker (ed.): International Missile Defence? Opportunities, Challenges and Implications for Europe, The Royal United Institute for Defence Studies, Whitehall Paper 55, Stephen Austin & Sons Ltd., London, 2002, pp 72 – 82.
And:
Vicky Armbruster: Progress in Missile Defence Technology and Engineering, in: Ibid, pp 107 – 112.

8 Useful definitions by the US Department of Defense: The Department of Defense Dictionary of Military and Associated Term, 12. April 2001, as Amended Through 17 October 2007, pp 545 – 546, <http://www.dtic.mil/doctrine/jel/new_pubs/jp1_02.pdf>, (09.12.07):
"Theater of war — "Defined by the Secretary of Defense or the geographic combatant commander, the area of air, land, and water that is, or may become, directly involved in the conduct of the war. A theater of war does not normally encompass the geographic combatant commander's entire area of responsibility and may contain more than one theater of operation.
Theater missile — A missile, which may be a ballistic missile, a cruise missile, or an air-to- surface missile (not including short-range, non-nuclear, direct fire missiles, bombs, or rockets such as Maverick or wire-guided missiles), whose target is within a given theater of operation. Also called TM.
Theater of operations — An operational area defined by the geographic combatant commander for the conduct or support of specific military operations. Multiple theaters of operations normally will be geographically separate and focused on different missions. Theaters of operations are usually of significant size, allowing for operations in depth and over extended periods of time. Also called TO. See also theater of war."

9 Artillery rockets are not included.

(MRBM) have a range up to 1300km, whereas intermediate ballistic missiles (IRBM) can hit targets in a distance of 3500km. All ballistic missiles with range beyond that are called intercontinental ballistic missiles (ICBM).[10]

Ballistic missiles are defined as "Any missile, which does not rely upon aerodynamic surfaces to produce lift and consequently follows a ballistic trajectory when thrust is terminated."[11] Their trajectory can be divided into a boost phase of a few minutes, when the missile engine accelerates the missile during its launch, a midcourse phase, when the missile is no longer accelerated and, in dependence of the missile type, the warhead is separated from the missile stages.[12] This is the longest flight period, which of course, depends on the range of the missile. After that the terminal phase begins, which lasts usually not longer than one minute, during that phase the warhead is seeking for its target. It is important to consider, that the speed, altitude, and endurance of the trajectory flight depends on the specific characteristics of the missile. Therefore, it is necessary to take into account that there are different characteristic trajectories for short-, medium-, intermediate- and long-range missiles.

In order to defend against ballistic missile attacks, the US is planning to field a multi-layered system, which is capable of intercept incoming missiles in each flight phase. The US Ballistic Missile Defense System is designed as an integrated system, which means that all countermeasures can be coordinated centrally. So far, this goal is not achieved by 2007 but the system integration continues along with the fielding of more sensors and effectors.[13]

In order to be able to defend against ballistic missiles it is necessary to be able to detect and to track a hostile missile launch. Therefore the US is fielding a combination of different space, see and land based sensors, which are capable of detecting the heat signature of a missile launch and then tracking the missile on its flight with a high resolution radar predicting possible trajectories and designated targets.[14]

According to the trajectory of a missile, different ways of intercepting it are possible.

For the first flight phase, the boost phase, the US plans to deploy an airborne laser[15] and an interceptor for the boost phase[16]. Both are still under development. During the midcourse flight phase, the US is testing the ground-based interceptor, which is carrying an 'exoatmospheric kill vehicle' that is designed to intercept warheads during their flight in space.[17] This system is planned to be operational by 2013. To intercept missiles in their terminal phase, the US already posses different weapon systems. Depending of the distance to the target there are different mo-

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10 UK Ministry of Defence: Missile Defence – a public discussion paper, December 2002, p 8, <http://www.mod.uk/NR/rdonlyres/9DA4A026-DB01-466D-B5B3-EA6C64A2D85F/0/missiledef.pdf >, (09.12.07).

11 US Department of Defense: The Department of Defense Dictionary of Military and Associated Term, 12. April 2001, as Amended Through 17 October 2007, p 58, <http://www.dtic.mil/doctrine/jel/new_pubs/jp1_02.pdf>, (09.12.07).

12 Usually, only the warheads of missiles with ranges of at least medium-range, separates from the missile stages. The problem of intercepting these re-entry vehicles will be addressed later on.

13 Development goals for 2008/ 2009 by the Missile Defense Agency: <http://www.mda.mil/mdalink/pdf/blk08.pdf>, (10.12.07).

14 For further details on the different sensors: Missile Defense Agency: Global Ballistic Missile Defense – A Layered Integrated Defense, 4th Edition, <http://www.mda.mil/mdalink/pdf/bmdsbook.pdf> , (10.12.07). See also: Missile Defense Agency Fact Sheets, <http://www.mda.mil/mdalink/html/factsheet.html>, (10.12.07).

15 Missile Defense Agency: Fact Sheet – Airnorne Laser, 2007, <http://www.mda.mil/mdalink/pdf/laser.pdf> , (10.12.07).

16 Missile Defense Agency: Fact Sheet – Ballisitic Missile Defense System Interceptors, 2006, <http://www.mda.mil/mdalink/pdf/bmdint.pdf> , (10.12.07).

17 Missile Defense Agency: Fact Sheet – Ground Based Midcourse Interceptors, <http://www.mda.mil/mdalink/pdf/gmd07.pdf>, (10.12.07).

bile sea and land based effectors, capable to intercept different missile types in accordance to their incoming altitude.[18]

So far, parts of the ballistic missile defence system are already deployed in California, Alaska, Greenland and the United Kingdom. Additionally, the US deploy sensors in Japan and South Korea and want to deploy a ground based radar station in the Czech Republic and ten ground based interceptors (GBI) in Poland by 2013. The deployment of these forces abroad is necessary to expand interception options.[19]

3. The Bush administration and its arguments in favour of ballistic missile defence

During the Gulf War of 1990 – 1991, on February 25, 1991, 28 US soldiers died in Dhahran, Saudi Arabia, when an Iraqi SCUD missile hit an US Army barrack. The fielded Patriot surface to air, mobile, air defence missile system failed to intercept the incoming missile.[20] This incident, underlines the need for ballistic missile defence on a tactical, theatre level. This problem was addressed when president George Bush Senior signed the "Missile Defense Act" on the 5th December 1991.[21] In ongoing discussions about missile defence the incident from Dhahran, Saudi Arabia is often the example and one reason for the need of a ballistic missile defence for the US.

Therefore, force protection, including missile defence, is one part of the agenda for a full spectrum dominance, which was formulated in the Joint Vision 2010 and 2020 in June 2000.[22]

Prior to the first inauguration of George W. Bush on the 20th January 2001, the Project for the New American Century, a neoconservative think tank, which inspired parts of the US administration, published a report in September 2000, on 'Rebuilding America's Defenses'. This report highlights the necessity of a ballistic missile defence on a tactical level and a global scale as a defence against limited intercontinental strikes by rogue states.[23] One key finding of the paper is: "Develop and deploy global missile defenses to defend the American homeland and American allies, and to provide a secure basis for U.S. power projection around the world."[24]

After the inauguration of George W. Bush and after the terror attacks on the 11th of September 2001, the president declares that:

> "The gravest danger to freedom lies at the crossroads of radicalism and technology. When the spread of chemical and biological and nuclear weapons, along with ballistic

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18 See based: SM3; land based: THAAD, PATRIOT PAC3 and future MEADS. Please see for further details:<http://www.mda.mil/mdalink/html/factsheet.html> , (10.12.07).

19 LT Gen Trey Obering USAF, Director Missile Defense Agency: Missile Defence Program Overview for the Transatlantic Roundtable on Defence and Security, 18. September 2007, <http://www.mda.mil/mdalink/pdf/thirdsite.pdf >, (13.12.07).

20 Report of the US General Accounting Office: Patriot Missile Defense: Software Problem Led to System Failure at Dhahran, Saudi Arabia, 4. February 1992, <GAO/IMTEC-92-26>, (09.12.07).

21 US Public Law 106-38: To declare it to be the policy of the United States to deploy a national missile defense, <http://usgovinfo.about.com/gi/dynamic/offsite.htm?site=http://thomas.loc.gov/cgi%2Dbin/bsdquery/z%3Fd106:HR00004:%7CTOM:/bss/d106query.html%7C>, (09.12.07).

22 US Joint Chiefs of Staff: US Joint Vision 2010– America's Military preparing for tomorrow, 1996, pp 22 – 24, <http://www.dtic.mil/jointvision/history/jv2010.pdf>, (09.12.07).
And:
US Joint Chiefs of Staff: US Joint Vision 2020 – America's Military preparing for tomorrow, 2000, pp 23 - 24, <http://www.dtic.mil/jointvision/jv2020b.pdf >, (09.12.07).

23 Project for the New American Century: Rebuilding America's Defenses: Strategy, Forces and Resources for a New Century, September 2000, pp 50 – 54, <http://www.newamericancentury.org/RebuildingAmericasDefenses.pdf>, (09.12.07).

24 Project for the New American Century: Rebuilding America's Defenses: Strategy, Forces and Resources for a New Century, September 2000, p 5, <http://www.newamericancentury.org/RebuildingAmericasDefenses.pdf>, (09.12.07).

> missile technology—when that occurs, even weak states and small groups could attain a catastrophic power to strike great nations. Our enemies have declared this very intention, and have been caught seeking these terrible weapons. They want the capability to blackmail us, or to harm us, or to harm our friends—and we will oppose them with all our power."[25]

Along with different methods to stop the proliferation of ballistic missiles and weapons of mass destruction, the US decided to build a missile defence to address this danger. The impact of that danger becomes even more obvious when considering the US perspective, that rogue states and non-state actors can most likely not be deterred.

> "In the Cold War, especially following the Cuban missile crisis, we faced a generally status quo, risk-averse adversary. Deterrence was an effective defense. But deterrence based only upon the threat of retaliation is less likely to work against leaders of rogue states more willing to take risks, gambling with the lives of their people, and the wealth of their nations."[26]

One of the greatest concerns of the US administration was and still is, that those rogue states are able to blackmail the US, deterring US action, by threatening US allies, friends, US forces abroad or even the US homeland.[27] Therefore ballistic missile defence is an option to provide protection against missile attacks and to deter those attacks. Deterrence is possible by new means; it is no longer deterrence by punishment[28], which based on a retaliatory response after an attack, but deterrence by denial, which means to paralyse enemies assets to project power by threatening preemptive strikes against[29] and deploying a credible defence system against their offensive assets[30]. Furthermore, deploying a ballistic missile defence could also dissuade states to acquire ballistic missiles and weapons of mass destruction, because the capability to actively defend against missiles reduces their political value as a possible deterrent.

> "We aim to convince our adversaries that they cannot achieve their goals with WMD, and thus deter and dissuade them from attempting to use or even acquire these weapons in the first place."[31] And, "rogue states such as Iran, Iraq, Libya and North Korea are less likely to invest in missiles as a weapon of choice if they know they will face effective defenses".[32]

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25 President Bush, West Point, New York, 01.06.2002, in: The National Security Strategy of the United States of America, September 2002, p 17, <http://www.whitehouse.gov/nsc/nss/2002/nss.pdf> , (09.12.07).

26 The National Security Strategy of the United States of America, September 2002, p 19, <http://www.whitehouse.gov/nsc/nss/2002/nss.pdf> , (09.12.07).

27 The National Security Strategy of the United States of America, September 2002, p 19, <http://www.whitehouse.gov/nsc/nss/2002/nss.pdf> , (09.12.07).

28 Klaus-Dieter Schwarz: The Future of Deterrence, German Institute for International and Security Affairs, Stiftung Wissenschaft und Politik (SWP), SWP Research Paper, June 2005, pp 9 – 10. < http://www.swp-berlin.org/en/common/get_document.php?asset_id=2356> (19.11.2007).

29 Karl P. Muller/ Jasen J. Castillo/ Forrest E. Morgan/ Negeen Pegahi/ Brain Rosen: Striking First – Preventive and Preemptive Attack in US National Security Policy, RAND Corporation, Santa Monica, 2006, p 13, <http://www.rand.org/pubs/monographs/2006/RAND_MG403.pdf>, (09.12.07).

30 US Departement of State, Bureau of Arms Control: Fact Sheet, 1. September 2001, <http://www.state.gov/t/ac/rls/fs/2001/4891.htm>, (09.12.07).

31 The National Security Strategy of the United States of America, March 2006, p 23, <http://www.whitehouse.gov/nsc/nss/2006/nss2006.pdf> , (09.12.07).

32 US Departement of State, Bureau of Nonproliferation: Fact Sheet, 1. September 2001, <http://www.state.gov/t/isn/rls/fs/2001/4932.htm> , (09.12.07).

Finally, the US concluded to build a new triad, a combination of offensive and defensive capabilities to conquer a ballistic missile threat to US forces, allies, friends or the US homeland.[33] This is the end of a policy based on mutual assured destruction (MAD)[34].

The new approach to face a threat to the US, caused by weapons of mass destruction in combination with ballistic missiles, is based on the assumption that the threat is caused by rogue states and possibly non-state actors, which are supported by rogue states. These actors, both state and non-state, cannot necessarily be deterred by a credible threat of a retaliatory response. Therefore, to continuously be able to project power abroad, to prevent blackmailing against the US and protect deployed forces, installations, allies, friends and the US homeland, the US decided to withdrawal from the ABM treaty and has begun the fielding of a ballistic missile defence. The current US administration believes that this is a proper tool to dissuade states from acquiring those capabilities and is an option to actively defend against missile attacks if deterrence or preemption fails.

4. The threats – ballistic missile and WMD proliferation

In order to achieve the maximum gain of ballistic missiles as a deterrent or for coercive diplomacy they must be combined with weapons of mass destruction. Ballistic missiles itself are a proper tool to deliver atomic weapons, their use as a delivery system for biological or chemical weapons is reduced because of their lack of precision, and characteristic trajectory which causes extreme shifts in temperatures at the warhead during the different flight phases, which could effect biological or chemical agents.[35] However, it must highlighted, that the development of a nuclear, chemical or biological device for delivery with a ballistic missile is a huge technical challenge and therefore need a long period of constant effort.[36]

The US Intelligence Council estimated that the US would face an increased ICBM threat by 2015. The proliferation of ballistic missiles of shorter range already poses a threat to US forces abroad and its possibility of power projection, US allies and friends.[37] "Ballistic missiles are already in widespread use and will continue to increase in number and variety. The availability of weapons of mass destruction for use on ballistic missiles vastly increases the significance of this threat."[38] The states of concern mentioned in these reports are Iran, North Korea, Pakistan, India, Russia and China, sometimes even Syria and Libya and in dependence of the date of publication also Iraq. Another aspect of the ballistic missile threat is the fear that these states are willing to share WMD capabilities and ways to deliver it with non-state actors.

In order to be able to evaluate the need for a ballistic missile defence a short overview about the current and possible future missile threat caused by North Korea, Iran and Hezbollah will follow.

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33 The National Security Strategy of the United States of America, March 2006, p 27, <http://www.whitehouse.gov/nsc/nss/2006/nss2006.pdf> , (09.12.07).

34 For details on mutual assured destruction (MAD): Henry D. Sokolski: Getting MAD – Nuclear Mutual Assured Destruction, Its Origins and Practice, Strategic Studies Institute (SSI), U.S. Army War College, 01. November 2004, <http://www.strategicstudiesinstitute.army.mil/Pubs/download.cfm?q=585>, (09.12.07).

35 Oliver Schmidt: Iranische Raketen und Marschflugkörper - Stand und Perspektiven, Working Paper, The German Institute for International and Security Affairs, Stiftung Wissenschaft und Politik (SWP), <http://www.swp-berlin.org/de/common/get_document.php?asset_id=3531>, (11.12.07).

36 Policy Department External Policies Study: Missile Defence and European Security, The European Parliament, November 2007, p 4, <http://www.europarl.europa.eu/activities/expert/eStudies/download.do?file=18359#search=%20missile%20defence%20>, (13.12.07).

37 US National Intelligence Council: Foreign Missile Development and the Ballistic Missile Threat through 2015, December 2001, pp 8 – 9, <http://www.dni.gov/nic/PDF_GIF_otherprod/missilethreat2001.pdf>, (11.12.07).

38 US National Air and Space Intelligence Center, March 2006, p 29, <http://www.nukestrat.com/us/afn/NASIC2006.pdf>, (11.12.07).

It will give a brief survey of the current status regarding delivery systems and WMD capabilities in different world regions.

4.1 North Korea

As result of the continued six party talks North Korea agreed to disarmament in return for economic aid, in February 2007. However, the year before North Korea was making news with the conduction of several long-range missile tests and the detonation of a nuclear device in October 2006.[39] The development of the Taepo-Dong 2 missile led to the US perception of an increased threat. "DPRK systems potentially increase the missile threat to the United States. If the new missiles are indeed closely modified versions of the R-27, they are likely more accurate and have greater range than other DPRK missiles."[40]

But it is necessary to mention, that the missile test were complete failures. The missiles exploded shortly after their launch.[41] Worth mentioning is that North Korea is exploring solid fuel engine and multi-stage missile technology, which is a basic need for the development of ICBMs.[42] Another reason for concern is, that North Korea exports missile technology to Iran, Pakistan, Syria, Egypt, Libya, UAE and Yemen, which have lead to the independent missile programs by Iran and Pakistan.[43]

However, North Korea posses ballistic missiles with a medium and may be intermediate range and has WMD capabilities. Consequently, it is able to threaten US assets and allies in the region. How long it will take for North Korea to develop ballistic missiles, which are capable of carrying a WMD warhead and reaching the US homeland is a highly speculative estimation. Also, it depends on the North Korean government's intention to do so and possibly support from other nations. Therefore all published estimations are showing a huge verity in timeframes. The report by the US National Intelligence Council of 2001 said that North Korea is testing a missile already capable of reaching parts of the US.[44] The current range of North Korean ballistic missiles is still a matter of discussions but estimated ranges are way below that. Currently North Korea has most likely missiles with a range of 1300km - 1500km at a payload of about of 700kg and is developing missiles with a range of up to 4000km.[45]

So, after all, North Korea is capable to threaten US assets and allies in the region, namely South Korea and Japan. The combination of ballistic missiles and WMD constitute a threat capability. So far, there are no reports of North Koreas military assistants to non-state actors. And North Korea has shown its willingness to reduce tensions in the region, therefore it is questionable in how far it is willing to pose a threat and make use of its capabilities. However, it not possible to be certain about North Koreas current and future intentions, therefore a capability based threat

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39 The Guardian Unlimited – Special Report: Timeline North Korea and Nuclear Weapons 1991 – 2007, <http://www.guardian.co.uk/korea/subsectionmenu/0,,854619,00.html>, (13.12.07).

40 Steven A. Hildret: North Korean Ballistic Missile Threat to the United States, CRS Report for Congress, 3. January 2007, p 6, <http://www.fas.org/sgp/crs/nuke/RS21473.pdf>, (13.12.07).

41 Steven A. Hildret: North Korean Ballistic Missile Threat to the United States, CRS Report for Congress, 3. January 2007, pp 3 – 4, <http://www.fas.org/sgp/crs/nuke/RS21473.pdf>, (13.12.07).

42 For more details on solid and liquid fuel missile engines see: Federation of American Scientists – Military Analysis Network: Rockets for Rookies, <http://www.fas.org/man/dod-101/sys/missile/rookies.htm>, (20.12.07).

43 UK Ministry of Defence: Missile Defence – a public discussion paper, December 2002, p 12, <http://www.mod.uk/NR/rdonlyres/9DA4A026-DB01-466D-B5B3-EA6C64A2D85F/0/missiledef.pdf >, (09.12.07).

44 US National Intelligence Council: Foreign Missile Development and the Ballistic Missile Threat through 2015, December 2001, p 9, <http://www.dni.gov/nic/PDF_GIF_otherprod/missilethreat2001.pdf>, (11.12.07).

45 Arms Control Association: Fact Sheet – Worldwide Ballistic Missile Inventories, September 2007, <http://www.armscontrol.org/factsheets/missiles.asp>, (13.12.07).

perception allows the assumption that North Korea is posing a possible threat to US interests in the region.

4.2 Iran

Recent US Intelligence reports give an impressing example of how difficult it is to assess a possible threat. Iran was and still is suspected to develop a nuclear military capability. First discussions started in 2003 and are ongoing today. According to the US National Intelligence Estimate in November 2007, Iran has halted the development of a military nuclear capability since 2003 and is not in possession of a nuclear weapon.[46] Until now, Iran has failed to entirely comply with UN transparency demands concerning its civil nuclear program.[47]

However, Iran is developing ballistic and cruise missiles with a medium to intermediate range. Current assessments estimate that Iran possess 25 – 100 liquid fuelled ballistic missiles with a range of 1300 – 1500km, carrying a 750kg payload.[48] Consequently, the Shahab-3 missile is capable of reaching Israel, NATO and EU countries. Estimations about the specifications of the Shahab-3 missile are showing a huge variety. According to official Iranian statements, the missile and its variants Shahab-3A has already a range of 2000 – 2500km. Some US and Israeli estimations confirm this, while other sources have much more moderate and conservative findings.[49] Additionally, Iran possesses twelve land attack cruise missiles (LACM) AS15 KENT. This highly sophisticated weapons system was designed by the Soviet Union in the 1980s and was delivered to Iran by the Ukraine without the nuclear warheads.[50] This cruise missile was designed to carry a 200kt nuclear warhead over a range of 2000 – 3500km.[51] Land attack cruise missiles in general are very difficult to intercept because of their characteristic trajectory; therefore they constitute a serious challenge for missile defence systems. But the spread of LACM technology is by far smaller than the spread of ballistic missiles. It is unlikely that Iran is capable to operate this weapon system, but it is reasonable to suggest that it will be used for reverse engineering.[52]

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46 US National Intelligence Council: National Intelligence Estimate - Iran: Nuclear Intentions and Capabilities, November 2007, <http://www.dni.gov/press_releases/20071203_release.pdf>, (14.12.07).

47 United Nations Security Council Resolution 1747, S/Res/1747 (2007), 24. March 2007, <http://daccessdds.un.org/doc/UNDOC/GEN/N07/281/40/PDF/N0728140.pdf?OpenElement>, (14.12.07).

48 Arms Control Association: Fact Sheet – Worldwide Ballistic Missile Inventories, September 2007, <http://www.armscontrol.org/factsheets/missiles.asp>, (13.12.07).

49 For Details on the Shahab-3 missile see: Athony H. Cordesman: Iran's Nuclear and Missile Programs - A Status Report, Centre for Strategic and International Studies (CSIS), 4th December 2007, <http://www.csis.org/media/csis/pubs/071126irannukewmd.pdf>, (19.12.07).
And:
Robert H. Schmucker: Iran and its Regional Environment, The Nuclearization of the Broader Middle East as a Challenge for Transatlantic Policy Coordination Panel 1, Second Transatlantic Conference, Berlin, March 27, 2006, <http://www.hsfk.de/downloads/Panel%201%20-%20Schmucker.pdf>, (19.12.07).

50 The Financial Times, Ukraine admits it exported cruise missiles to Iran and China, 18.03.2005.

51 Athony H. Cordesman: Iran's Nuclear and Missile Programs - A Status Report, Center for Strategic and International Studies (CSIS), Washington D.C., 4th December 2007, <http://www.csis.org/media/csis/pubs/071126irannukewmd.pdf>, (19.12.07).
And:
Globalsecurity.org: Weapons of Mass Destruction – AS 15 Specifications, <http://www.globalsecurity.org/wmd/world/russia/as-15-specs.htm>, (19.12.07).

52 Oliver Schmidt: Iranische Raketen und Marschflugkörper - Stand und Perspektiven (Iranien Missile and Cruise Missiles), Working Paper, the German Insitute for International and Securtiy Affairs, Stiftung Wissenschaft und Politik (SWP), <http://www.swp-berlin.org/de/common/get_document.php?asset_id=3531>, (11.12.07).

Iranian plans for developing a ballistic missile capability that can reach the US homeland are, according to different sources, in progress but will last until 2015.[53] So far, Iran is suspected to participate in the North Korean ballistic missile program Taepo-Dong-1, -2 and is developing the Shahb-4 and -5 with ranges of 3000 – 5500km.[54] (The United Kingdom has an approximate distance to Iran of 3750km.[55]) But in order to develop these capabilities it necessary to accomplish the solid fuel and multi stage missile technology first, neither North Korea nor Iran have shown these capabilities so far.

After all, Iran possesses the capabilities to threaten US interests in the region and beyond. US forces in Iraq, Afghanistan, Bahrain, Qatar and Saudi Arabia are in reach of Iranian missiles. Additionally, Iranian forces can threaten the very important shipping routes of the Persian Gulf and other major oil-hubs.[56] Already, Israel and partially EU and NATO territory is within the range of Iranian assets and it is likely that this will increase over the years. It is therefore possible to conclude that Iran is technically able to threaten US interests or blackmail the US. However, this assumption is strictly based on Iranian capabilities. Whether Iran is now or in future really willing to use its military assets to influence US policy is currently unpredictable.

4.3 Non-State Actor – Hezbollah

The Hezbollah could be a recent example for the proliferation of missile technology to non-state actors. There are strong indications that Hezbollah used Iranian rocket and cruise missile technology during the war between Israel and the Hezbollah on Lebanese soil in summer 2006.[57] But, so far, there are no reports about a delivery of sophisticated missile technology or even any technology related to weapons of mass destruction, except for repeated reports of the delivery of a solid fuelled ballistic missile with a range of estimated 200 – 400km in dependence of its payload.[58] The weapon systems used by the Hezbollah are artillery rockets launched from mostly mobile multiple launch platforms, they are also known under the synonym "Katyushas", their

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53 US National Intelligence Council: Foreign Missile Development and the Ballistic Missile Threat through 2015, December 2001, p 9, <http://www.dni.gov/nic/PDF_GIF_otherprod/missilethreat2001.pdf>, (11.12.07).

54 Mark Fitzpatrick: Iran and North Korea: The Proliferation Nexus, in: Survival, Vol 48 No 1, Spring 2006.
And:
Anthony H. Cordesman and Khalid R. Al-Rodhan: The Gulf Military Forces in an era of asymmetric war: Iran, The Center for Security and International Studies (CSIS), Washington D.C., July 28, 2006, <http://www.csis.org/media/csis/pubs/060728_gulf_iran.pdf>, (19.12.07).

55 UK Ministry of Defence: Missile Defence – a public discussion paper, December 2002, p 11, <http://www.mod.uk/NR/rdonlyres/9DA4A026-DB01-466D-B5B3-EA6C64A2D85F/0/missiledef.pdf >, (09.12.07).

56 Anthony H. Cordesman: Iran, Oil, and the Strait of Hormuz, The Center for Security and International Studies (CSIS), Washington D.C., 26th March 2007, <http://www.csis.org/media/csis/pubs/070326_iranoil_hormuz.pdf>, (20.12.07).

57 Mark Williams: The Missiles of August - The Lebanon War and the democratization of Missile Technology, in: Technology Review published by the Massachusetts Institute of Technology (MIT), 16th of August 2006, <http://www.technologyreview.com/Biztech/17314/page1/ >, (11.12.07).
And:
Mark Williams: The Missiles of August - Part II - The Lebanon War and the democratization of Cruise Missile Technology, in: Technology Review published by the Massachusetts Institute of Technology (MIT), 29th of August 2006, <http://www.technologyreview.com/Biztech/17374/>, (11.12.07).
See also:
Kenneth Katzmann: Iran: US Concerns and Policy Responses, CRS Report for Congress, US Congressional Research Service - The Library of Congress, 2nd June 2006, pp 23 – 24, <http://fpc.state.gov/documents/organization/67845.pdf>, (11.12.07).

58 Jennifer Kline: Special Report: Challenges of Iranian Missile Proliferation Part 2, Assistance to Hezbollah, in: WMD Insights, October 2006, <http://www.wmdinsights.com/I9/I9_ME1_ChallengesofIran_2.htm>, (11.12.07).

range is limited to under 100km.[59] So far, the militarily organised part of Hezbollah can reach US allies and assets in the region. It is not clear whether any state is willing to increase the armament to an extend, where the Hezbollah is capable to attack targets in greater distance to its area of operation. This could be a hint for the argument that states do not intend to proliferate possible WMD and their delivery systems to non-state actors.[60]

> "The risk of the use of ballistic missiles by terrorists as a means of delivering WMD is low, as they are very unlikely to be in a position to operate ballistic missiles without extensive state-sponsored or state-condoned assistance."[61]

On the other hand, instable states always bear the danger, that the control over the military forces get lost and therefore interest groups or non-state actors get access to WMD and missile systems.[62]

> "Nevertheless, it should not blind us to the possibility of certain states losing centralized control of part of their missile arsenal. Conceivably, like-minded fanatics in terrorist groups and the military could conspire to seize such a capability in the context of civil war or serious internal disturbance."[63]

4.4 Summary of the ballistic and WMD threat

It is possible to conclude that the proliferation of missile technology has reached a point where states of concern could technically threaten US interests in the region of the broader Middle East and Asia. The current ballistic missile inventories of rogue states such as North Korea or Iran are able to target US military installations in the region, and US allies and friends. This provides a theoretical danger of blackmail policies against the US.[64] At the moment only Russia and China are capable to reach US soil directly with an ICBM. If the proliferation of missile technology continues and non-proliferation policies like the Missile Technology Control Regime (MTCR)[65] are ineffective, it is likely that other states will acquire ICBM capabilities. At the moment there are no strong indications that non-state actors will make use of ballistic missile technology.

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59 Globalsecurity.org: Hezbollah Rockets, <http://www.globalsecurity.org/military/world/para/hizballah-rockets.htm>, (20.12.07).

60 Policy Department External Policies Study: Missile Defence and European Security, The European Parliament, November 2007, p 11, <http://www.europarl.europa.eu/activities/expert/eStudies/download.do?file=18359#search=%20missile%20defence%20>, (13.12.07).

61 Policy Department External Policies Study: Missile Defence and European Security, The European Parliament, November 2007, p 11, <http://www.europarl.europa.eu/activities/expert/eStudies/download.do?file=18359#search=%20missile%20defence%20>, (13.12.07).

62 Scott D. Sagen/ Kenneth N. Waltz: The Spread of Nuclear Weapons – A Debate Renewed, W.W. Norton & Company, New York, London, 2nd Edition, 2003, pp 10 – 12.

63 Policy Department External Policies Study: Missile Defence and European Security, The European Parliament, November 2007, p 11, <http://www.europarl.europa.eu/activities/expert/eStudies/download.do?file=18359#search=%20missile%20defence%20>, (13.12.07).

64 Anthony Seaboyer/ Oliver Thränert: What Missile Proliferation Means for Europe, in: Survival, Vol. 48, No. 2, Summer 2006.
And:
Nora Bensahel and Daniel L. Byman (Editor): The Future Security Environment in the Middle East: Conflict, Stability, and Political Change, RAND Corporation, Project Air Force, Santa Monica, 2004, <http://www.rand.org/pubs/monograph_reports/2005/MR1640.pdf>, (20.12.07).

65 The Missile Technology Control Regime (MTCR), since 1987, <http://www.mtcr.info/english/guidetext.htm>, (20.12.07).

It could be a worst-case scenario, that states like North Korea or Iran will use their ballistic missile capabilities to deter certain US policies by threatening US forces in their region or US allies and friends. However, it is not clear that these states would provoke a direct military confrontation with the US because of an overwhelming US supremacy. Although, uncertainty about other states intentions remains a factor in risk analysis and strategic planning.[66]

Also the risks of an irrational state or non-state actor, launching an attack, or an accidental missile attack, as described by Scott D. Sagan, remain a factor for assessing the need for a ballistic missile defence.[67] But assessing the nuclear, biological, chemical and radiological threat to the US, it has to be mentioned, that missiles do not necessarily represent the most likely way of delivery. Non-state actors could also make use of public or private transportation, commercial shipping, or could target critical infrastructure for example.[68] Another challenging threat shortly mentioned before, is a cruise missile threat. Cruise missiles fly aerodynamic, usually in a low contour profile, which makes them very hard to detect, track and intercept.[69]

Finally, a ballistic missile defence system provides an imperfect but at least a protection against parts of older, current and most likely future threats for US foreign policy. This technical solution addresses the factor of uncertainty in the international system and allows force deployments even within the reach of hostile ballistic missiles. It also reduces the vulnerability of allies and friends and critical installations and infrastructure.

Assessing the threat to the US caused by ballistic missiles, it is also possible to conclude and necessary to mention that less states want to acquire WMD and ballistic missile capabilities than 20 years ago. The overall number of ICBM and IRBM has decreased; only India, China and North Korea are deploying or developing IRBM. In comparison to the Cold War five new states possess MRBM, namely India, Iran, Israel, North Korea, Pakistan and Saudi Arabia. In addition to the five permanent members of the United Nations Security Council, 25 other states are possessing SRBM. These inventories vary in quality, age and operability but some states also are capable to produce them independently. Overall, the number of states possibly hostile to the US has also decreased compared to 1987.

> "In short, the ballistic missile threat today is limited and changing relatively slowly. There is every reason to believe that it can be addressed through diplomacy and measured military preparedness. Officials during any year of the Cold War would have gladly traded the dangers they confronted then for today's limited threat."[70]

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66 Mearsheimer, John J., in: Tim Dunne/ Milja Kurki/ Steve Smith (Editor): International Relations Theory - Discipline and Diversity, New York, Oxford University Press, 2007, p 74 – 75.

67 Scott D. Sagen: The Limits of Safety – Organizations, Accidents, and Nuclear Weapons, Princeton University Press, Princeton, 1993.

68 The US National Intelligence Council: Report of the National Intelligence Council's 2020 Project – Mapping the Global Future 2020, NIC 2004-13 December 2004, <http://www.foia.cia.gov/2020/2020.pdf>, (20.12.07).

69 Andrew Feickert: Missile Survey: Ballistic and Cruise Missiles of Foreign Countries, CRS Report for Congress, US Congressional Research Service - The Library of Congress March 5, 2004, <http://fpc.state.gov/documents/organization/31999.pdf>, (20.12.07).
And:
Thomas G. Mahnken: The Cruise Missile Challenge, Center for Strategic and Budgetary Assessments, Washington D.C., March 2005, <http://www.csbaonline.org/4Publications/PubLibrary/R.20050310.CruiseMiss/R.20050310.CruiseMiss.pdf>, (20.12.07).

70 Joseph Cirincione: The Declining Ballistic Missile Threat, Policy Outlook, February 2005, Carnegie Endowment for International Peace, Washington D.C., 2005, p 10, <http://www.carnegieendowment.org/files/DecliningBallisticMissileThreat2005-2.pdf>, (21.12.07).

So it is possible to conclude in accordance to Joseph Cirincione that the ballistic missile threat is declining.[71]

5. Conclusion

For a final review the George W. Bush administration claims the necessity for ballistic missile defence system because of the ongoing proliferation of ballistic missile technology to rogue states and possibly non-state actors, which could use them to blackmail the US or launch a first strike. The fear is that deterrence could fail against these actors.

BMD offers a tool for non-proliferation, by decreasing the incentive for states, hostile to the US, to acquire ballistic missile capabilities, because of a reduced effectiveness of ballistic missiles in face of BMD. Therefore BMD is a tool of a new concept of deterrence, addressed in the mentioned new triad. BMD also allows the US to react to accidental missile launches and offers new military options of force deployment because of an increased ability of force protection, which is, as mentioned before, a goal of the US Joint Vision 2020.

But, there are reasons to doubt these advantages of a ballistic missile defence. For instance did Kenneth Waltz conclude, "Nuclear states have tended to come in hostile pairs.".[72] This could mean that ballistic missile defence is only a limited non-proliferation tool, because the incentive for the acquisition of WMD and ballistic missiles has a regional aspect. For instance, the Iranian nuclear program could be an effect of Iran Iraq war in 1980 – 1988, where both sides used ballistic missiles and Iran was attacked with WMD. Additionally, Iran is suspected to aim for a regional dominance and it is surrounded by nuclear-armed states.[73] This offers strong arguments for Iran to acquire WMD capabilities additionally to the incentive caused by US President Bush's Axis of Evil Speech.[74] For this reason it is doubtable that BMD is an effective non-proliferation tool. However, it is possible that it affects the rational calculus of state actors who want to use WMD and ballistic missiles as a deterrent against the US.

To use BMD as an active defence against irrational actors is another argument pro deploying a BMD. Kenneth Waltz argued that it is most likely that states possessing WMD and ballistic delivery systems, will act rational, because they are not willing to risk major looses for minor gains and could therefore be deterred.[75] However, it is possible to develop several worst-case scenarios like internal coups, accidental launches or irrational behaviour that could lead to a missile attack against US forces, installations, allies, friends or even the US homeland.

It is also possible that non-state actors acquire ballistic missile capabilities, but it is unlikely that states sponsor this proliferation and so far it has not happened very often. Kenneth Waltz argues, that states have a very strong incentive to keep the control over missile forces, because of the major risks related to their use.[76]

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71 Joseph Cirincione: The Declining Ballistic Missile Threat, Policy Outlook, February 2005, Carnegie Endowment for International Peace, Washington D.C., 2005, <http://www.carnegieendowment.org/files/DecliningBallisticMissileThreat2005-2.pdf>, (21.12.07).

72 Scott D. Sagen/ Kenneth N. Waltz: The Spread of Nuclear Weapons – A Debate Renewed, W.W. Norton & Company, New York, London, 2nd Edition, 2003, p 41.

73 Oliver Thränert: Ending Suspicious Nuclear Activities in Iran – Discussing the European Approach, Working Paper, the German Insitute for International and Securtiy Affairs, Stiftung Wissenschaft und Politik (SWP), 18. November 2004, <http://www.swp-berlin.org/en/common/get_document.php?asset_id=1758>, (21.12.07).

74 The President's State of the Union Address, January 29, 2002 The United States Capitol, Washington, D.C. http://www.whitehouse.gov/news/releases/2002/01/20020129-11.html#>, (21.12.07).

75 Scott D. Sagen/ Kenneth N. Waltz: The Spread of Nuclear Weapons – A Debate Renewed, W.W. Norton & Company, New York, London, 2nd Edition, 2003, pp 10 – 11.

76 Scott D. Sagen/ Kenneth N. Waltz: The Spread of Nuclear Weapons – A Debate Renewed, W.W. Norton & Company, New York, London, 2nd Edition, 2003, pp 10 – 11.

Finally, the US wants to have a BMD to keep the full spectrum dominance and to remain able to deploy forces around the world. It also reduces the ability of hostile states to blackmail the US or threaten or successfully attack US assets abroad. It also offers some security to allies and friends and increase incentives for security cooperation. However, the current ballistic missile threat is mainly caused by states possibly hostile to the US, which only possess short- to medium-range ballistic missiles and are therefore far out of reach of the US homeland. Only important civil and military installations abroad are within the range of their missiles, not to forget US allies and friends. Therefore the development and deployment of a BMD against limited attacks against the US homeland is not to counter a current threat but possible future challenges, caused by ongoing WMD and missile technology proliferation. The argument that possible non-state actors or terrorists will use ballistic missiles for attacks against the US, it allies and friends is relatively weak, because of alternative ways of delivery for these purposes and their heavy dependence on state support for access to the necessary technology.

As a final thought, ballistic missile defence is a complex topic, which effects on a broad spectrum. It will be interesting to see how the US Russia dialog will continue on a bilateral basis and within NATO and a perceived declining missile threat beyond the theatres of operation. For NATO, missile defence could be again a topic for major dissent or a new reason for its existence.[77] In Asia BMD is one major focus of regional armament efforts, especially by Japan, Taiwan and South Korea.[78] In the region of the Broader Middle East, Israel is on of the biggest investor in missile defence systems. Israel is already deploying its theatre ballistic missile defence system (Arrow) against SRBM.

Therefore, the question for the future seems not to be if "we" really want or need BMD, as many critics argue, but how we use this new tool for political reasons and how it will effect concepts of deterrence and the use of force and thus future security and defence policy.

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77 Alexander Bitter: NATO and Missile Defence - Implications for Germany before the Bucharest summit in 2008, SWP Research Paper 2007/RP 13, December 2007, the German Institute for International and Securtiy Affairs, Stiftung Wissenschaft und Politik (SWP), <http://www.swp-berlin.org/en/common/get_document.php?asset_id=4548>, (21.12.07).

78 Kurt M. Campell/ Jeremiah Gertler/ Derek Mitchell/ Clark Murdock: The Paths Ahead – Missile Defence in Asia, in: Military Technology – MILTECH, 10/2007, pp 78 – 86.

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