

**October 2013**

## **A SUSTAINABLE APPROACH TO NUCLEAR ZERO: BREAKING THE NUCLEAR-CONVENTIONAL LINK**

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### **Summary**

The momentum towards abolishing nuclear weapons has been building in recent years, with the level of debate at its highest since the end of the Cold War. While this has re-focused attention on the opportunities and potential strategies for limiting, and even eventually abolishing, nuclear arsenals, insufficient attention is being given to the increasing importance of certain non-nuclear, or 'conventional', weapons – namely, long-range conventional ballistic missiles and missile defence technology. Unilateral advances in such US conventional capacities may incentivise Washington to reduce its nuclear arsenal, but they are likely to have the opposite effect on other nuclear-armed states, which will feel increasingly vulnerable.

There is now a pressing need to mitigate the prospect of conventional weapons imbalances hindering progress in getting all nine nuclear weapon states on the path of abolition. There is a strong and problematic link between nuclear and conventional weapons created by the way that nuclear weapons act as the 'great equalisers' in global strategic relations i.e. lowering the impact of conventional weapons imbalances between some states, particularly the great powers. This link means the potential for progress on global nuclear reductions could stall at an early stage if left unaddressed in the coming years.

### **Introduction**

While this paper will look at this issue in a global perspective, a great deal of the focus will be on US defence policy. This is because the United States has become particularly important in recent years, not only in terms of developing advanced conventional weapons, but also in linking these weapons closely to developments in relation to nuclear weapons.<sup>1</sup> The paper will examine the move made by the Obama administration to tie its re-engagement with the issue of nuclear disarmament to developments in conventional weaponry and the problems this is creating for achieving a sustainable approach to 'getting to zero'. It will then analyse the importance of this issue against the backdrop of the so-called strategic 'pivot' in US defence and foreign policy towards the Asia-Pacific region and the tensions created by an overly short-term approach to the nuclear-conventional link for long-term stability and peace in this region. Finally, the paper will briefly discuss some of the knock-on effects of these developments for the rest of the world before outlining a number of recommendations for policy-makers and civil society groups.

### **The Obama Plan for a Nuclear Weapons-free World**

Since taking office, US President Barack Obama has appeared determined to reduce the salience and centrality of nuclear weapons in US defence posture, at least in part to help facilitate the achievement of a nuclear weapons-free world. A central component of the Obama administration's plan (but often overlooked in wider discussions about the pros and cons of nuclear disarmament) is the gradual shift to a far greater reliance upon advanced conventional weaponry in US defence policy, specifically through a larger role for ballistic missile defences

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(BMD), advanced conventional strike weapons, such as the Prompt Global Strike (PGS) programme, and sophisticated command, control, and monitoring capabilities. The imperative behind this move is that the administration hopes to foster the domestic conditions favorable for further US nuclear reductions – thereby reigniting the push towards nuclear abolition internationally – while at the same time placating domestic critics concerned about a weakening of US security and of the US’ global role. From the point of view of the Obama administration, an increased role for advanced conventional weapons will allow it to reduce its own nuclear stockpile, signaling to other nuclear powers its intent to eventually disarm. This move was illustrated in the administration’s 2010 US Nuclear Posture Review:

*“...fundamental changes in the international security environment in recent years – including the growth of unrivaled U.S. conventional military capabilities, major improvements in missile defenses...enable us to fulfill...objectives at significantly lower nuclear force levels and with reduced reliance on nuclear weapons ... without jeopardizing our traditional deterrence and reassurance goals.”<sup>2</sup>*

The two main pillars of this approach are the offensive PGS capabilities and the defensive BMD programme. (1) The PGS system is essentially an attempt to create a capability for a rapid precision missile strike across the globe using conventional warheads. The idea, in its simplest form, is to mount conventional warheads (rather than nuclear ones) on long-range missiles (although other means of delivering the warheads are also being examined). In principle, this would allow the United States to strike targets anywhere in the world in as little as an hour.<sup>3</sup> (2) The US BMD programme is a complex global network of radars, satellites and missiles used to identify, track and intercept incoming missiles aimed both at the US homeland, US allies, and US troops in theatres around the world. As the 2010 US Nuclear Posture Review points out, these new capabilities have been largely accepted as essential components of US strategic thinking by the Obama administration:

*“Although nuclear weapons have proved to be a key component of U.S. assurances to allies and partners, the United States has relied increasingly on non-nuclear elements to strengthen regional security architectures, including a forward U.S. conventional presence and effective theater ballistic missile defenses. As the role of nuclear weapons is reduced in U.S. national security strategy, these non-nuclear elements will take on a greater share of the deterrence burden.”<sup>4</sup>*

Despite the public image of an administration less convinced of the virtues of BMD than its predecessor, the administration has supported levels of BMD funding far higher than that under Reagan, Bush senior, or Clinton. Indeed, during Obama’s first term in office: an ambitious and flexible BMD plan for the defense of Europe was unveiled; the very wide-ranging Ballistic Missile Defense Review was produced, outlining the administration’s decision to push ahead with BMD around the globe; and finally, US negotiators fought hard to keep limitations on BMD out of the Strategic Arms Reduction Treaty (New START) signed with Russia in April 2010.<sup>5</sup> Similarly, the administration has expedited research and development of three main conventional global strike programs: the “Hypersonic Technology Vehicle 2”, the “Advanced Hypersonic Weapon”, and the Air Force’s existing “Conventional Strike Missile”, although the focus of the latter program has broadened to include the potential use of boost glide systems, and even armed drones.<sup>6</sup>

While the idea of increasing the role of advanced conventional weaponry as a component of US national security thinking and practice is not new, Obama is the first president to strongly link these plans with the goal of pursuing a world free from nuclear weapons. However, the administration’s domestic policy focus must also take into consideration the international impact of the disarmament agenda on the major military fault lines in key US nuclear relationships. When examined in this context, the Obama administration’s plan to reduce the salience of nuclear weapons through – at least in part – a greater role for advanced conventional weaponry in order to foster larger nuclear reductions appears unlikely to succeed at best; and likely to derail long-term progress at worst. The inescapable problem is that US superiority in advanced conventional weaponry already exists, making it very difficult for any potential rival (let alone an adversary) to agree to work toward a nuclear-free world when such a move – already made

difficult by existing conventional imbalances – will magnify US power. The close link between nuclear reductions and increases in conventional capabilities essentially works to decrease US vulnerability in a nuclear disarmed world, while at the same time increasing the vulnerability of its current or future rivals and adversaries.

### The ‘Importance of the Asia-Pacific ‘Pivot’

One of the most important factors in the current focus on advanced conventional weaponry in the US defence posture is the so-called ‘pivot’ towards the Asia-Pacific region in US defence and foreign policy. The Obama administration has described the rationale behind this shift in focus from the Middle East and Central Asia of the immediate post-9/11 era towards this increasingly important region:

*“US economic and security interests are inextricably linked to developments in the arc extending from the Western Pacific and East Asia into the Indian Ocean region and South Asia, creating a mix of evolving challenges and opportunities. Accordingly, while the U.S. military will continue to contribute to security globally, we will of necessity rebalance toward the Asia-Pacific region. Our relationships with Asian allies and key partners are critical to the future stability and growth of the region. We will emphasize our existing alliances, which provide a vital foundation for Asia-Pacific security (emphasis added).”<sup>7</sup>*

While the main motivating factor for Washington’s return to the Asia-Pacific might be economic, the region does contain two centrally important strategic challenges for US policy-makers. First, at least in the short-term, the Korean Peninsula remains unstable and prone to periodic crises.<sup>8</sup> The main driver of this is the North Korean nuclear programme, which has proved difficult to contain despite the use of sanctions and negotiations. Second, and perhaps more over the longer-term, the US-Sino strategic relationship is set to become one of the defining features of the global security landscape in the decades to come.<sup>9</sup> This means that while the new ways of thinking about deterrence and the mix of conventional and nuclear force in the US defence posture may at first be aimed at countering short-term security threats in the region, the effect on longer-term stability between Asia’s major powers cannot be ignored.

#### North Korea

The development of North Korea’s nuclear weapons programme has been one of the key factors behind Washington’s current push for a greater role for advanced conventional weapons programmes.<sup>10</sup> At the same time, new nuclear and non-nuclear plans being developed by Washington remain the fundamental influence on North Korea’s strategic thinking.<sup>11</sup> The particular irony of this bilateral relationship is that North Korea’s original desire for a nuclear weapon was driven by the existence of US tactical nuclear weapons in South Korea (between 1958-1991) – a move designed to neutralise the threat of a conventional threat from the North. Yet with an increasing role for BMD and PGS in the US defence posture over the years to come, it is likely that it will instead be US conventional threats and capabilities that provide the justification for North Korea’s nuclear arsenal.

Often overlooked in regard to North Korea’s nuclear choices is the commanding role of US forces in any full-scale war on the peninsula. Rather than regional adversaries such as South Korea or Japan, the United States remains central to Pyongyang’s strategic calculations - it would, in fact, be a four-star American general, who would take overall operational control of all forces south of the 38<sup>th</sup> parallel, if war was declared.<sup>12</sup> While the North’s conventional forces are quantitatively important, qualitatively, they have consistently slipped behind South Korean and US forces, making a small nuclear deterrent increasingly appear to be the most reliable security guarantee for Pyongyang. Official statements have outlined the specific defensive role that the North’s nuclear weapons programme is meant to serve by way of deterring what they see as US aggression, stating that Pyongyang will only halt the programme if Washington “drops its hostile policy towards Pyongyang and addresses its concern.”<sup>13</sup> Nevertheless, as Shen Dingli points out, “To date, North Korea has virtually used the Six-Party talks to protect its nuclear development.”<sup>14</sup>

The furor caused by the DPRK rocket launches in April and December 2012, and the third nuclear test conducted in early 2013 have not helped this perception.

### *China*

In contrast, despite the rhetoric about growing competition between China and the United States and the military dimensions of China's rise<sup>15</sup>, US-Sino strategic relations at present remain stable. China's arsenal of deliverable nuclear weapons is estimated to be around 200 (with an additional 240 warheads held in reserve).<sup>16</sup> Given the limited number of warheads available, China has attempted to develop its sea-based deterrent but so far has failed to achieve a major upgrade in this area. Indeed, the latest research shows that its deterrent patrol is unlikely to be fully operational for some time.<sup>17</sup> However, the three Type 094 Jin Class submarines currently being built could mark a major change and the US Department of Defense estimates that up to five of these submarines may be eventually deployed.<sup>18</sup>

The combination of Washington's eastward turn in defence strategy and the changes it is signalling in terms of the offence-defence balance and deterrence is likely to be central in shaping China's nuclear policies in the coming years. As Taylor Fravel and Evan Medeiros have pointed out, the size of China's nuclear force, and the limited roles and missions that Chinese defence planners have assigned to it, are a direct product of Beijing's early embrace of the idea of deterrence through assured retaliation.<sup>19</sup> In particular, China's long-held position of 'no-first-use' has historically been entirely dependent on a perception in Beijing of stable deterrence relationships with any potential nuclear rival. Yet, some analysts have questioned the very foundations of this by arguing that China should consider a conventional strike on its nuclear forces and even nuclear reactors (the kind of mission that the PGS could in principle be used for) as a virtual first strike which would require nuclear retaliation.<sup>20</sup> Hans Kristensen has stated that: "China's war-planners would have to assume that any US conventional prompt attack forces could strike without warning against their own targetable nuclear weapon forces or support installations."<sup>21</sup> This, according to Kristensen means that "in fact, they would have to conclude that a strike against their nuclear deterrent could come before the conflict had escalated to nuclear use."<sup>22</sup>

The importance of the role of offensive US capabilities such as PGS is compounding the existing problems associated with missile defence. Fravel and Medeiros point out that it is the current combination of advanced defensive and offensive capabilities that causes concern to Chinese strategists, and that together, these systems are viewed in Beijing as potentially "threatening the viability of China's nuclear deterrent."<sup>23</sup> Such concerns were stated succinctly by Beijing after the announcement of talks between Washington and Tokyo on the possibility of Japan hosting a second long-range X-band radar at the Aomori Prefecture to bolster the regional missile defence system. China immediately released a statement saying that:

*"China has always believed that antimissile issues should be handled with great discretion, from the perspective of protecting global strategic stability and promoting strategic mutual trust among all countries ... we advocate... avoiding the situation in which one country tries to let its own state security take priority over other countries' national security."<sup>24</sup>*

This combination offers Beijing few options in reducing nuclear weapons in its own defence posture without ceding significant ground to the United States in terms of military superiority. If part of the rationale for reducing the role of nuclear weapons in the US defence posture is to help encourage other nuclear-armed states to move towards a world free of nuclear weapons, it is difficult to see what the incentive will be for China in a nuclear disarmed world in which US conventional superiority is even greater than it is today. Defence analysts have pointed to the development of the third generation Chinese intercontinental ballistic Missile (ICBM) that will be equipped with multiple independent re-entry vehicles as evidence of the extent of to which Chinese concerns over the US BMD plans are having real-world effects on Chinese defence

research and development.<sup>25</sup> China's development of anti-satellite and cyber warfare capabilities would appear to reinforce this conclusion.

The coming together of the 'pivot' and the increasing reliance upon advanced conventional weaponry in the US defence posture is producing a complicated combination, and it is far from clear that all US objectives can be achieved at the same time. A freeze, particularly in the development of the PGS system and in the deployment of some aspects of BMD, would be an important symbolic move and signal a willingness on the part of the United States to a serious, region-wide dialogue on strategic stability and arms control. In relation to the US-Sino relationship, this could involve specific Track II, and later Track I, bilateral discussions on BMD and the possibility of the current strategic arms reductions being made by Washington and Moscow being widened to include Beijing once low enough numbers are reached. It is currently official US policy to engage in bilateral dialogue with China on strategic stability with the goal of enhancing confidence, improving transparency and reducing mistrust between the two states. A freeze in advanced conventional deployments would at least remove this central barrier to the success of attempts to do so.

Such a freeze would also allow for the possibility of a new region-wide push for conventional arms control negotiations. As Robert Ayson has recently noted, in this part of the world, "efforts to build strong restraint through conventional arms control may be just as important as nuclear arms control itself".<sup>26</sup>

### **Knock-on Effects**

In response to North Korean provocation, Japan, too, is cooperating closely with the United States to build its own BMD system. This is compounding the effect of the advanced conventional weapons component of the US pivot towards the Asia-Pacific region described above, and puts extra pressure on the already stressed Sino-Japanese relationship.

The strategic relationship between India and Pakistan – a nuclear-armed relationship that is prone to periodic security crises – is also coming under increasing pressure due to the nuclear-conventional link. Taking its lead from the United States, India is investing considerable money in a two-tiered BMD programme, with the Prithvi air defence to be used for high altitude interceptions (50 to 80 kms), as well as an advanced air defence for low altitude interceptions (15 to 30 kms).<sup>27</sup> Pakistani officials have spoken publically of the link between recent upgrades of their tactical missile programme and concerns over the challenge to Pakistan's "minimum credible deterrent" posed by India's BMD programme.<sup>28</sup> Such moves in turn influence both Chinese and US defence policies in the region creating a 'spiral' effect of slow but consistent arms racing.<sup>29</sup>

### **Conclusion**

Despite the fact that there are still many obstacles to the full and effective deployment of BMD and PGS systems in their most ambitious incarnations, the overall trend towards a greater reliance on these weapons systems creates concern in the capitals of other nuclear powers. Increasing constraints on the US defence budget that are likely to place limits on continued conventional development, particularly on PGS, in the short-term, are insufficient to counter the image of a future nuclear disarmed world defined by overwhelming US conventional superiority. In short, future uncertainty and vulnerability are more important factors for Moscow and Beijing than whether a particular component of advanced conventional weaponry is funded in this year's defence budget.

The central problem for the United States as it attempts to use "the growth of unrivalled U.S. conventional military capabilities"<sup>30</sup> and "major improvements in missile defenses"<sup>31</sup> to reduce its reliance on nuclear weapons is that the equalising effect of nuclear weapons cannot be wished away. As a former US Secretary of Defense has admitted, "US conventional power-



projection capability and the concern that it may be used to intimidate, attack or overthrow regimes”<sup>32</sup>, is still one of the central concerns for current or potential adversaries of the United States.

As such, it may well be more useful for the Obama administration to think beyond the current focus solely on nuclear weapons reductions as a means of ensuring global security, and instead toward much more nuanced agreements covering a much wider range of weaponry. Although this will be more difficult than focusing explicitly on numbers of nuclear weapons, it is arguably the only way to build trust with nuclear rivals to the extent needed to make deeper nuclear reductions possible. If including conventional programs in future strategic arms limitations negotiations (not just with Russia) proves too difficult, then Washington will face a choice between dramatically scaling back the deployment of PGS and significantly delaying the deployment of BMD, or suspending efforts at further nuclear reductions altogether.

## Policy Recommendations

Based on the analysis above, a number of avenues for addressing these issues in terms of policy change in order to break the nuclear-conventional link can be identified:

### *Timing*

Timing is key to addressing the ways in which BMD research and deployment act as a barrier to multilateral nuclear disarmament. As David Cortright and Raimo Väyrynen have observed, President Reagan’s statement to President Gorbachev at the 1986 Reykjavik summit that the Strategic Defense Initiative deployment “could come after the elimination of nuclear missiles was an important conceptual point that few observers have noted.”<sup>33</sup> Many of the concerns expressed, particularly by Russia and China, about BMD could be countered by aligning the timetables of deployment with nuclear reductions to ensure that the shield is only lifted after the sword has been buried. Deterrence may be a far from perfect strategy, but it is far better than one side achieving effective impunity by maintaining a nuclear arsenal *and* a large-scale BMD system *at the same time*. However such assurances still do not address the longer-term concern about US conventional superiority in a nuclear disarmed world, and therefore a short-term focus on the timing of BMD deployment should not be thought of as a long-term solution in which limitations will be unavoidable.

### *Arms Control*

In relation to the PGS system in the United States and other long-range conventional offensive systems being developed by others, while confidence building measures can be useful in the short term, over the medium-long term, given the United States’ existing conventional superiority, there is no alternative to arms control measures. Two options are available immediately. The first is to include such weapons in efforts to renew the Conventional Forces in Europe Treaty. Russian concern over BMD (specifically the so-called ‘third site’ plan and the announcement of Obama’s ‘Phased Adaptive Approach’)<sup>34</sup> was one of the drivers of Moscow’s decision to suspend the treaty in 2007 and the inclusion of PGS in future discussions could be used as tool for reinvigorating negotiations. The second option is to widen future US-Russian talks on a follow on to the recent Strategic Arms Reductions Treaty (New START) to include non-nuclear strategic weapons, including those intended under the PGS programme. Such efforts would serve to reinforce the link between nuclear and advanced conventional weapons but in a way that reduces both rather than increasing one in order to reduce the other.

### *Regional Dialogue*

A renewed focus on regional dialogue on nuclear non-proliferation and disarmament will also allow for more opportunities to highlight and discuss the problem of intended and unintended consequences of advanced conventional weapons programmes. For example, the main intention behind US, Japanese and South Korean development of missile defence capabilities in the Asia-

Pacific region is to counter potential threats from North Korea and cement the deterrence link with United States. However, the significant but unintended effect of this is to make China far less likely to join multilateral efforts to reduce its nuclear arsenal. The same is true in relation to Russia's concerns over US and NATO defences primarily aimed at countering Iranian missiles, and Pakistan's concerns over India's burgeoning system which is only partly aimed at countering Pakistani missile threats (and some analysts claim is actually more directed towards a potential Chinese threat). A series of high-level regional talks should be held over the short-medium term addressing the long-term strategic consequences of the growing nuclear-conventional link and these should be supplemented by Track II civil society dialogues. Track II dialogues can not only help build trust and consensus around these issues amongst policy-influencers, as well as policy-makers, they can also play an important role in building the technical expertise necessary to support Track I discussions.

### *Civil Society*

Finally, civil society groups working on the issue of nuclear abolition can and should be more vocal in highlighting the problems associated with the nuclear-conventional link. In particular, while supporting the Obama administration's efforts to reinvigorate the nuclear disarmament agenda, NGOs, campaigners, think tanks and academics must ensure that the idea that the US nuclear arsenal can be replaced by BMD, PGS and other advanced conventional weapons is challenged at an early stage. At the very least, these issues need to be discussed publically by well-informed analysts to counter the wishful thinking of some public officials unable to appreciate the implications of narrowly defined national security policies for long-term goals such as nuclear disarmament. Similarly, much greater media attention is needed on this issue, particularly, given the seemingly technical nature of the subjects involved and the relative lack of public knowledge that programmes such as PGS even exist.

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### **About the Authors and this Paper**

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*This paper is the result of a research project, generously supported by the Network for Social Change and the W.F. Southall Trust.*

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## Notes

- <sup>1</sup> On this see Andrew Futter & Benjamin Zala, "Advanced US conventional weapons and nuclear abolition: why the Obama plan won't work", *The Nonproliferation Review*, 20:1 (2013) 107-122.
- <sup>2</sup> US Department of Defense, "Nuclear Posture Review", (April 2010), p. v, <http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf>
- <sup>3</sup> For the most comprehensive discussion of the PGS system see Amy F Woolf, "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues", Congressional Research Service, Washington D.C., 26 April (2013).
- <sup>4</sup> US Department of Defense, "Nuclear Posture Review", p. xiii.
- <sup>5</sup> See US Missile Defense Agency, "Historical Funding for MDA FY85-10," [www.mda.mil/global/documents/pdf/histfunds.pdf](http://www.mda.mil/global/documents/pdf/histfunds.pdf). For more on the final point, see Andrew Futter, "The Elephant in the Room: US Ballistic Missile Defense under Obama," *Defense & Security Analysis* 28:1 (2012) pp. 3-16.
- <sup>6</sup> Tom Collina, "U.S. Alters Non-nuclear Prompt Strike Plan", *Arms Control Today*, April 2011, [www.armscontrol.org/act/2011\\_04/PromptStrike](http://www.armscontrol.org/act/2011_04/PromptStrike).
- <sup>7</sup> United States Department of Defense, "Sustaining US global leadership: priorities for 21<sup>st</sup> century defense", (January 2012) pp2, <https://www.documentcloud.org/documents/282223-defense-strategic-guidance.html>.
- <sup>8</sup> See, Paul Rogers, "North Korea: Taking into Account the View from Pyongyang", Oxford Research Group Monthly Briefing, 30 April (2013), [http://www.oxfordresearchgroup.org.uk/publications/paul\\_rogers\\_monthly\\_global\\_security\\_briefings/north\\_korea\\_taking\\_account\\_view\\_pyongyang](http://www.oxfordresearchgroup.org.uk/publications/paul_rogers_monthly_global_security_briefings/north_korea_taking_account_view_pyongyang).
- <sup>9</sup> Richard Rosecrance and Gu Guoliang (Eds), *Power and Restraint: A Shared Vision for the U.S.-China Relationship* (New York: Public Affairs 2009).
- <sup>10</sup> For more on the North Korean nuclear programme see Mike Chinoy, "Meltdown: The Inside Story of the North Korea Nuclear Crisis", (St Martin's Press, New York: 2009).
- <sup>11</sup> Andrew O'Neil, "Nuclear Proliferation in Northeast Asia: The Quest for Security", (New York & Houndmills, Palgrave Macmillan: 2007) p. 71.
- <sup>12</sup> *Ibid.* pp71; see also Selig Harrison "Ending the Korean War", *The Korean Journal of International Studies*, 27:1, (2002) pp. 1-23.
- <sup>13</sup> Korean Central News Agency statement in 2003 quoted in Daniel Pinkston, "Bargaining Failure and the North Korean Nuclear Program's Impact on International Nonproliferation Regimes", *KNDU Review*, 8:2, (2003) p. 11.
- <sup>14</sup> Shen Dingli, "Cooperative denuclearisation toward North Korea", *The Washington Quarterly*, 32:4 (2009) p. 176.
- <sup>15</sup> John J. Mearsheimer, "The Gathering Storm: China's Challenge to US Power in Asia", *The Chinese Journal of International Politics*, 3:4 (2010) pp. 381-396.
- <sup>16</sup> Shannon N. Kile, Vitaly Fedchenko, Bharath Gopalaswamy & Hans M. Kristensen, "World Nuclear Forces" in Stockholm International Peace Research Institute, *SIPRI Yearbook 2011: Armaments, Disarmament and International Security* (Oxford and New York: Oxford University Press 2011) p. 340. It should be noted that all China's nuclear warheads are kept separately or 'de-mated' from their missiles.
- <sup>17</sup> *Ibid.*, p. 341.
- <sup>18</sup> US Department of Defense, "Military and Security Developments Involving the People's Republic of China 2010", Annual Report to Congress (Washington, DC, DoD: 2010) pp. 2-3, [http://www.defense.gov/pubs/pdfs/2010\\_CMPR\\_Final.pdf](http://www.defense.gov/pubs/pdfs/2010_CMPR_Final.pdf).
- <sup>19</sup> M. Taylor Fravel and Evan S. Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure", *International Security*, 35:2 (2010) pp. 48-87.
- <sup>20</sup> Peng Guangqian and Rong Yu, "Nuclear No-First-Use Revisited", *China Security*, 5:1 (2009) pp. 78-87.
- <sup>21</sup> Quoted in Elaine M. Grossman, "Jury Out: Do Advanced Conventional Weapons Make Nuclear War More Likely?", *Global Security Newswire*, 22 August 2012, <http://www.nti.org/gsn/article/jury-out-do-advanced-conventional-weapons-make-nuclear-war-more-likely/>.
- <sup>22</sup> *Ibid.*
- <sup>23</sup> Fravel and Medeiros "China's Search for Assured Retaliation", p. 86.
- <sup>24</sup> Quoted in, *Global Security Newswire*, "U.S. Missile Defense Push in Asia Seen as Response to North Korea, China", 23 August 2012, <http://www.nti.org/gsn/article/us-desire-asian-missile-shield-seen-response-rising-china/>.
- <sup>25</sup> IHS Jane's, "IHS Jane's Weapons: Strategic", 24 January 2012, <http://www.janes.com/products/janes/defence-security-report.aspx?ID=1065932184>; *Global Security Newswire*, "Chinese Missile Push Seeks to Counter U.S. Protections, Experts Say", 24 August 2012, <http://www.nti.org/gsn/article/chinese-missile-push-seeks-counter-us-protections-experts/>. However it is



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worth noting Gregory Kulacki's point of caution in relation to reports of Chinese 'development' as opposed to 'research' in this area: Gregory Kulacki, "New York Times: Distorting Chinese Press Report on Missile Capabilities?", *All Things Nuclear: Insights on Science and Security*, Union of Concerned Scientists, 27 August 2012, <http://allthingsnuclear.org/new-york-times-distorting-chinese-press-report-on-missile-capabilities/>.

<sup>26</sup> Robert Ayson, "Arms Control in Asia: Yesterday's Concept for Today's Region?", *Australian Journal of International Affairs*, 67:1 (2013), p. 11.

<sup>27</sup> Eric Auner, "Indian Missile Defense Program Advances", *Arms Control Today*, January/February 2013, [http://www.armscontrol.org/act/2013\\_01-02/Indian-Missile-Defense-Program-Advances](http://www.armscontrol.org/act/2013_01-02/Indian-Missile-Defense-Program-Advances).

<sup>28</sup> See Tahir Kahn, "Pakistan Concerned at Indian Ballistic Missile System", *News Pakistan*, 9 May (2013), <http://www.newspakistan.pk/2013/05/09/pakistan-concerned-indian-ballistic-missile-system/>. See also Abhijit Singh, "Ballistic Missiles, BMD Fuel India-Pakistan Tensions", *World Politics Review*, 5 July (2011), <http://www.worldpoliticsreview.com/articles/9364/ballistic-missiles-bmd-fuel-india-pakistan-tensions> and Petr Topychkanov, "India's Prospects in the Area of Ballistic Missile Defense: A Regional Security Perspective", Carnegie Moscow Center Working Paper, 26 July (2012), <http://carnegieendowment.org/2012/07/26/india-s-prospects-in-area-of-ballistic-missile-defense-regional-security-perspective/dfbd>.

<sup>29</sup> Desmond Ball, "Arms Modernization in Asia: An Emerging Complex Arms Race" in Andrew T.H. Tan (ed.), *The Global Arms Race: A Handbook* (Routledge: London 2010), pp. 30-51.

<sup>30</sup> US Department of Defense, *Nuclear Posture Review* (2010), p. 6.

<sup>31</sup> *Ibid.*

<sup>32</sup> Harold Brown, "New Nuclear Realities", *Washington Quarterly*, 31:1, p. 20.

<sup>33</sup> David Cortright and Raimo Väyrynen, *Towards Nuclear Zero*, IISS Adelphi Paper No. 410, (London: Routledge, 2010), p. 153.

<sup>34</sup> See Futter, "The Elephant in the Room".