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**EVALUATING THE THREAT OF NUCLEAR  
TERRORISM:**

Cutting through the rhetoric

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**ABSTRACT**

This major research paper (MRP) provides a strong case for dismissing the overblown rhetoric of nuclear alarmism by demonstrating that a multitude of constructive actions are being taken in order to mitigate what is a substantially small threat. By effectively evaluating the arguments for alarmism and responding to them in turn, this MRP asserts that the assumptions from which stem the contemporary overblown rhetoric on nuclear terrorism are not grounded. Fears about terrorists operating independently to acquire nuclear materials, fears about the safety of nuclear installations and radiological sources as well as fears about state-sponsored nuclear terrorism are assuaged through a reasoned deconstruction of arguments.

Furthermore, this MRP argues that multilateral nuclear security initiatives are an essential component of global counter-nuclear terrorism efforts, given that there are numerous unilateral, bilateral and multilateral initiatives that exist explicitly for the prevention of nuclear weapon proliferation within the arsenals of terrorists.

The threat of nuclear terrorism hangs over the world like a dark and ominous cloud; a peril looming larger today than ever before; the ultimate catastrophe; the most immediate and extreme threat to global security; posing the gravest danger to freedom at the crossroads of radicalism and technology; the “sum of all fears.” The use of overblown rhetoric has led to the sensationalization of nuclear terrorism while detracting from the development of a substantive understanding of how the threat is effectively mitigated by the global nuclear security regime. In fact, by “overreacting to current dangers while mischaracterizing those of the past... nuclear alarmists drive misguided policies that could threaten international stability... today and in the future.”<sup>1</sup>

This major research paper (MRP) will demonstrate that a multitude of constructive actions are being taken to mitigate what is a substantially small threat and as such, those in positions of power and leadership should stop misinforming the public through the use of overblown rhetoric. Furthermore, this MRP argues that multilateral nuclear security initiatives are an essential component of global counter-nuclear terrorism efforts, given that there are numerous unilateral, bilateral and multilateral initiatives that exist to prevent the proliferation of nuclear weapons within the arsenals of terrorists by creating a community of counter-proliferation that effectively imposes its rules on the entire nuclear world.

This MRP will address this rhetoric on nuclear terrorism, which has been inflamed by 9/11 and tempered by the domestic political agendas of successive US administrations over the past twelve years. This MRP will also feature a brief discussion on what makes rhetoric alarmist and a brief overview of nuclear terrorism in order to ensure a solid understanding of the issue in preparation for analysis, with the overblown rhetoric highlighted through simple analysis of

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<sup>1</sup> Francis J. Gavin, “Same As It Ever Was: Nuclear Alarmism, Proliferation and the Cold War,” *International Security*, Vol. 34, No. 3 (Winter 2009/10), p. 7-37.

institutional text. Finally, the post-9/11 rhetoric of nuclear terrorism, which claims that nuclear terrorism is impending and immediate, will be reconciled with reality through a reasoned deconstruction of the main arguments that are used by proponents of nuclear alarmism.

The perceived disconnect between government rhetoric and reality was first identified by John Mueller, who labelled such language as “overblown.”<sup>2</sup> Mueller’s exhaustive research efforts in the field of terrorism and the “reactions (and costly over-reactions) it often inspires,”<sup>3</sup> has led to criticisms of the US government’s inflammation of rhetoric pertaining to the potential of nuclear terrorism. According to Mueller, the impact of nuclear weapons throughout history has been minimal, “despite activist rhetoric, strategic theorizing, defense budgets and political posturing” and as such policy preoccupations which overemphasize the threat of nuclear weapons are a “substantial waste of money and effort.”<sup>4</sup> Political actors, Mueller argues have long exaggerated the danger and importance of nuclear weapons, using the public’s fears to justify unnecessary weapons programs and arms-control negotiations, including a counterproductive invasion of Iraq and bloated counterterrorism initiatives.<sup>5</sup>

Mueller identifies a “failure in imagination” in evaluating the threat of nuclear terrorism due to the inability of analysts to truly consider and appreciate the “difficulties confronting the atomic terrorist,” also noting that terrorist groups have only exhibited limited desire and even less progress in “going atomic.”<sup>6</sup> Most importantly, Mueller draws attention to the work of Michael Levi, in which Levi demonstrates that terrorist action for the detonation of a nuclear

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<sup>2</sup> John E. Mueller, *Overblown: how politicians and the terrorism industry inflate national security threats, and why we believe them*, New York: Free Press, 2006.

<sup>3</sup> Ibid.

<sup>4</sup> John E. Mueller, *Atomic Obsession: Nuclear Alarmism from Hiroshima to Al-Qaeda*, Oxford University Press, 2009.

<sup>5</sup> Ibid.

<sup>6</sup> Ibid., p. 163.

device requires 20 steps, during which, mistake or failure at any stage means failure.<sup>7</sup> Although it may be “‘not impossible’ to surmount each individual step, the likelihood that a group could surmount a series of them... could approach impossibility.”<sup>8</sup>

### Critiques of Mueller’s Overblown Logic

Mueller’s work has not been free of criticism however. For example, Hugh Gusterson writes that although “many of Mueller’s sharp-edged points about the hyping of the dangers of nuclear proliferation and terrorism fall into the first (insightful) category...his critiques of arms control and his apparent smugness about all nuclear dangers belong in the latter [deviant due to exaggeration, misshapeness or just plain wrongness].”<sup>9</sup> Gusterson’s critique is built upon quotes from scientific sources which demonstrate that it would not be prohibitively difficult for a terrorist group to acquire the technical and engineering expertise necessary to create a nuclear weapon, while also criticizing Mueller for ignoring the possibility that a terrorist group seeking a nuclear weapon might be provided access to one by disillusioned scientists with nuclear-weapons experience, or a rogue element within a state.<sup>10</sup>

Although this MRP will demonstrate that these criticisms do not hold true in light of recent facts, there is something important to be taken from Gusterson’s critique of Mueller’s work. Mueller regards multilateral initiatives such as arms-control and non-proliferation treaties and sanctions extraneous to the necessary architecture required for ensuring nuclear security. Furthermore, Mueller views treaties as “bureaucratically unwieldy” and that states will only agree to them when there is no real sacrifice to be made. Contrary to such a view however,

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<sup>7</sup> Mueller, *Atomic Obsession*, p. 186-187.

<sup>8</sup> *Ibid.*, p. 183.

<sup>9</sup> Hugh Gusterson, “Atomic Escapism? Book Review: ATOMIC OBSESSION: Nuclear Alarmism from Hiroshima to al-Qaeda,” *American Scientist*, Vol. 99, No. 1 (January-February 2011).

<sup>10</sup> *Ibid.*

multilateral initiatives are in fact an integral part of the global nuclear security architecture and serve to mitigate the threat of nuclear terrorism. As Gusterson notes, “the importance of the Treaty on the Non-Proliferation of Nuclear Weapons...is that it releases countries from the prisoner’s dilemma here: the treaty and its inspection provisions give confidence to countries who want to eschew nuclear weapons as long as they can be sure that their rivals do so too.”<sup>11</sup>

From a methodological standpoint, this MRP is written from the generation of a hypothesis that fears about nuclear terrorism are overblown, derived through the following process: the perceived disconnect between what is read and the reality of the situation leads to an engagement with contemporary literature which documents the efforts and successes achieved thus far in counter-nuclear terrorism. As such, it has been noted that previous studies into the subject matter have revealed that “significant portions” of literature on Weapons of Mass Destruction (WMD) terrorism are “tantamount to circular discussions between those who hype the threat of chemical, biological, radiological and nuclear (CBRN) attacks based on technological deterministic arguments and poorly sourced or incomplete data on perceived, but not proven, expressions of interest in CBRN by groups or individuals, and those who debunk such claims based on the historical data or the rudimentary capabilities demonstrated to date by terrorist groups.”<sup>12</sup> However, it remains that, “literature on CBRN, particularly that from policy and/or advocacy organizations and... some official documents must be read carefully to separate fact from inference.”<sup>13</sup>

This MRP contributes to the literature by cutting through the existing rhetoric through the consultation of contemporary sources and recognizing observable efforts being undertaken

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<sup>11</sup> Gusterson.

<sup>12</sup> Dane Rowlands, Jeremy Littlewood and Joshua Kilberg, “Kanishka Project Contribution Program: CBRN Terrorism Study,” *Norman Paterson School of International Affairs*, 31 August 2012, p. 10-11.

<sup>13</sup> Rowlands, p. 11.

towards preventing nuclear terrorism, in creating a substantial body of evidence which demonstrates that the current rhetoric on nuclear terrorism is overblown and needs to be reconciled with reality to prevent the pursuit of erroneous policy objectives, given that, “obsession with nuclear weapons...has often led to policies that have been unwise, wasteful and damaging.”<sup>14</sup>

## “Alarmist Rhetoric” and Nuclear Terrorism

### What makes rhetoric “alarmist”?

This MRP refers to the view that nuclear terrorism and nuclear proliferation serve as the greatest threat facing the US today as the core definition of overblown rhetoric. Building upon the work of Mueller in his “overblown” thesis, Francis J. Gavin applies the banner term of “nuclear alarmism” to rhetoric that is predicated upon the myths that arise from faulty observations of the role nuclear weapons played during the Cold War,<sup>15</sup> among other reasons. Although Gavin uses the term to describe those who write on the broader topic of nuclear proliferation, his argument remains relevant due to his identification of the three threats that alarmists focus on as: rogue regimes, nuclear terrorism, and tipping points which could lead to “proliferation cascades.”<sup>16</sup>

As such, nuclear alarmists “exaggerate and oversimplify contemporary nuclear threats while underplaying those of the past.” Rogue states, terrorism, and tipping points existed prior to 9/11, they are not new phenomena. Intercepted correspondence between Al-Qaeda senior

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<sup>14</sup> Mueller, *Atomic Obsession*, p. 236.

<sup>15</sup> Gavin.

<sup>16</sup> Proliferation cascade refers to the belief that the emergence of a new nuclear weapon state would predicate the emergence of others in an attempt to “restore” balance to the regional nuclear balance of power.

leadership indicates this to be true, given that “the enemy started thinking about these weapons before WWI. Despite their extreme danger, we only became aware of them when the enemy drew our attention to them by repeatedly expressing concerns that they can be produced simply with easily available materials.”<sup>17</sup>

Gavin’s argument is based upon the investigation and study of trends in Cold War history while this MRP is focused on examining and drawing conclusions from analysis of present day realities. As such, although this MRP echoes Gavin’s belief in not belittling the threat of nuclear proliferation and nuclear terrorism and that “scholarly and foreign policy communities [should] think more clearly and more soberly about the causes and consequences...alarmism is not a strategy,”<sup>18</sup> the MRP is different based upon this one important regard.

### Defining Nuclear Terrorism

In its simplest form, nuclear terrorism refers to the detonation of a nuclear weapon or device containing fissile or radiological material by terrorists. The 2005 International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) defines an act of nuclear terrorism as “a person/entity unlawfully or intentionally uses nuclear material with the intent to cause substantial damage to property or environment, or with the intent to compel a natural or legal person, an international organization or a State to do or refrain from doing an act.”<sup>19</sup>

In 2005, Charles D. Ferguson and William C. Potter proposed categorizing nuclear terrorism into four categories:

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<sup>17</sup> Gavin.

<sup>18</sup> Ibid.

<sup>19</sup> United Nations, “International Convention for the Suppression of Acts of Nuclear Terrorism,” *United Nations*, 13 April 2005, Date of Access: 21 October 2013, [http://treaties.un.org/doc/Treaties/2005/04/20050413%2004-02%20PM/Ch\\_XVIII\\_15p.pdf](http://treaties.un.org/doc/Treaties/2005/04/20050413%2004-02%20PM/Ch_XVIII_15p.pdf), Article 2.

1. The theft and detonation of an intact nuclear weapon;
2. The theft or purchase of fissile material leading to the fabrication and detonation of a crude nuclear weapon;
3. Attacks against and sabotage of nuclear facilities, in particular nuclear power plants, causing the release of large amounts of radioactivity; and
4. The unauthorized acquisition of radioactive materials contributing to the fabrication and detonation of a radiological dispersion device.<sup>20</sup>

This MRP takes this breakdown one step further: classifying the first two as methods of “active” nuclear terrorism and the latter two as methods of “passive” nuclear terrorism. Whereas the former pertains to terrorists engaging with or ready to engage in actual physical pursuits to acquire and fabricate nuclear materials, the latter refers to situations in which terrorists will attempt to co-opt or divert existing materials and nuclear facilities.

### Who are the Terrorists?

The modern era has ushered in a new definition of terrorism which differs greatly from the classical definition of terrorism. In the past, terrorists attempted to force political leaders to either take or refrain from carrying out certain actions by instilling fear across a broad audience, whereas modern day terrorist groups have a wide variety of means by which to pursue a much wider range of objectives. The rise in fears over nuclear terrorism has coincided with the development of a new type of politically motivated terrorist organization, which is now “fuelled by extremist religious ideologies that rationalize destruction, vengeance, and punishment as both necessary ends in themselves and as tools to achieve a better world,”<sup>21</sup> whilst ignoring the divide

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<sup>20</sup> Charles D. Ferguson, and William C. Potter, *The Four Faces of Nuclear Terrorism*, New York: Routledge, 2005.

<sup>21</sup> Bruce Hoffman, *Inside Terrorism*, New York: Columbia University Press, 1998, p. 87-88.

between combatants and non-combatants.<sup>22</sup> It is important to note however that making the decision to engage in nuclear terrorism over conventional terrorism remains a strong strategic and tactical consideration for terrorist groups; meaning that, although political-religious terrorist groups have threatened the use of nuclear weapons, it still remains a prohibitively costly exercise, requiring a lot of organizational depth, resources and most importantly, willpower.

### **The Impact of Nuclear Terrorism**

There is no dispute that if a terrorist nuclear attack was to occur, it would be costly and devastating. Research in the aftermath of 9/11, led chiefly by the research of Graham Allison, has been focused on future attacks, while focusing on costs in terms of human lives and psychological effects, with a substantially lower focus on the economic costs of terrorist attacks.<sup>23</sup> The results of these studies are appropriately horrifying, leading to the creation of various public tools through which estimated death tolls can be calculated for a variety of nuclear detonations.<sup>24</sup> As an example, the surface detonation of an improvised Highly Enriched Uranium (HEU) device with an estimated yield of 10 kilotonnes in downtown Washington would result in 50,000 immediate fatalities with a further 100,000 due to blast, radiation and fallout. A detonation in New York would yield 135,000 immediate casualties with a further 225,000. Airburst detonations would double these figures.

Recent research into the economic costs of nuclear terrorist attacks are also appropriately disconcerting. In a study titled “The economic impact of a terrorist attack on the twin ports of

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<sup>22</sup> Ferguson, *The Four Faces of Terrorism*, p. 18-20.

<sup>23</sup> Harry W. Richardson, Peter Gordon, and James Moore II, eds., *The Economic Impact of Terrorist Attacks*, Northampton: Edward Elgar Publishing, 2005, p. 1.

<sup>24</sup> One such tool can be found at <http://nuclearsecrecy.com/nukemap3d/> in which approximate nuclear blast radii are plotted on a map in order to show affected areas, while giving fatality and injury estimates. There are a host of other options which the user can play with, providing a brief interval of morbidly entertaining amusement.

Los Angeles-Long Beach,” the authors identify these two busy seaports as a target for terrorist attack. Such an attack would result in local economic losses of about \$1.108 billion USD of lost output and 10,061 person-years of employment. In terms of the global economy, the attack would result in \$34 billion USD worth of direct, indirect and induced costs, with 212,000 person-years of employment losses and up to \$648 million USD in imputed time costs of transportation-related delays.<sup>25</sup>

These numbers are not small, but although the human and economic costs of such attacks are high, the threat itself is not – it is necessary to ensure that research must always be prefaced with an honest threat assessment. When presented independent of such a rationalizing context, it would be easy for policy makers to succumb to fear of these numbers, thereby leading to overblown and disproportionate reactions and policy responses.

### **Reading the Political Rhetoric: Cataloguing the “Overblown”**

References to nuclear terrorism can be traced back as far as the early 1990s, it is not until after 9/11 that we see a large increase to public policy references, particularly from the US. In the 1990s, the threat of mass destruction terrorism involving nuclear weapons began to appear in the national security strategies of Western countries in reaction to the growth of apocalyptic and political-religious terrorist groups<sup>26</sup> who seemed less constrained in the methods they chose to pursue their ends.<sup>27</sup> The 1995 Tokyo subway attack by Aum Shinrikyo served as crucial impetus for the promotion of national interest in protecting against CBRN attacks. With this heightened interest in WMD terrorism, states began to pay increased attention to the monitoring and tracking of terrorist organizations; leading to a resulting increase in the number of reported and

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<sup>25</sup> Richardson, p. 262-286.

<sup>26</sup> Ferguson, *The Four Faces of Nuclear Terrorism*, p. 18-19.

<sup>27</sup> Benjamin Cole, *The Changing Face of Terrorism*, New York: I. B. Tauris, 2011, p. 1.

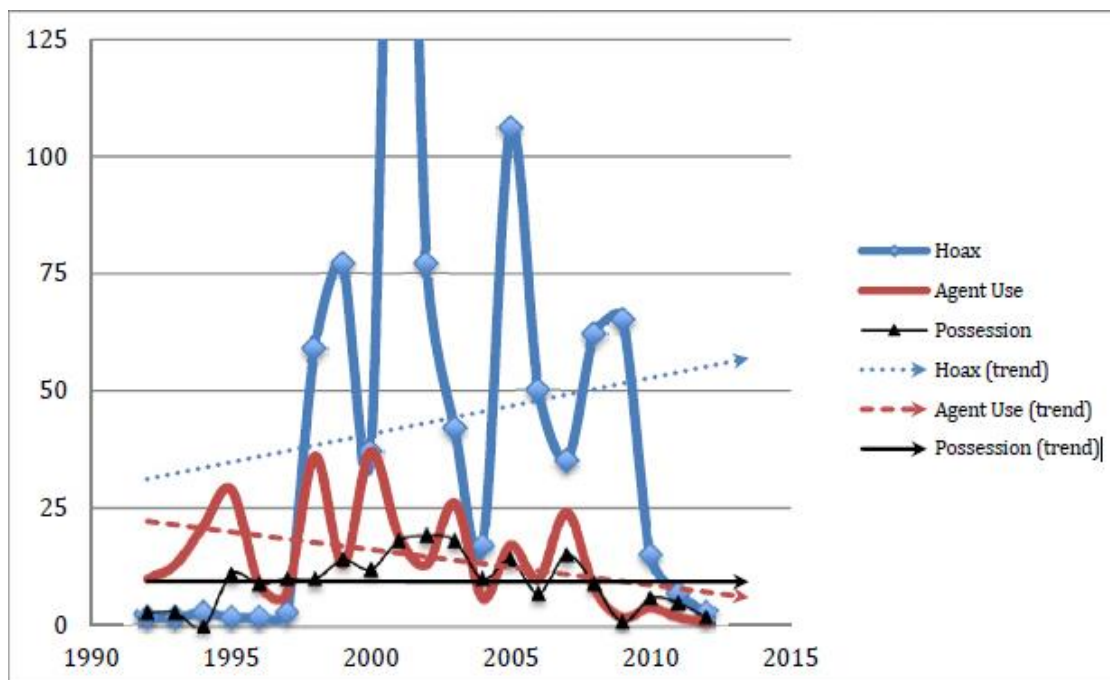
documented attempts by terrorists to acquire WMDs. As an example, prior to 1980, there were just 50 reported CBRN terror incidents worldwide, with 8 being actual attacks, while in the 11 years following 9/11 there have been 550 reported incidents, resulting in 82 actual attacks.<sup>28</sup>

Figures 1 and 2 track the number of CBRN incidents over time since 1990 while also noting the absence of any actual radiological or nuclear attacks.

Figure 1: Number of CBRN Attacks Broken Down by Threat Level<sup>29</sup>

	Number of Groups (number of actual attacks)	Typical Agent
Common Threats	52 (122)	Chlorine, cyanide, ricin
Intermediate Threats	4 (36)	Anthrax, botulinium, sarin
Least Common Threats	0 (0)	Radiological, nuclear

Figure 2: CBRN Incidents over Time Since 1990<sup>30</sup>



<sup>28</sup> Rowlands, p. 7.

<sup>29</sup> Ibid., p. 18.

<sup>30</sup> Includes incidents across the CBRN spectrum.  
Rowlands, p. 13.

The tracking of US government rhetoric on nuclear terrorism begins with the publication of *A National Security Strategy for a New Century* in December 1999 under the administration of President William J. Clinton. In this document there is no mention of nuclear terrorism; all mentions of the word “nuclear” reference the missile-delivered nuclear stockpiles of the US and Russia, specifically in reference to arms control and disarmament. Additional appearances of “nuclear” beyond US and Russia are found in reference to Iran, Iraq, North Korea and their respective WMD programmes. Terrorism itself is identified and briefly discussed as an encompassing general term with no direct linkage to WMDs.<sup>31</sup> The 2001 National Security Strategy, published as *A National Security Strategy for A Global Age*, follows in the footsteps of the 2000 National Security Strategy document in which mentions of “nuclear” once again relate to Russia, Iran, Iraq, North Korea, with only two mentions of “nuclear” in relation to WMD terrorism. No clear link was established between nuclear materials and terrorism within the Strategy itself.<sup>32</sup>

However, on 11 September 2001, the world “formally entered the era of mass destruction terrorism.”<sup>33</sup> From that day forward, WMD terrorism became one of the foremost national security issues for the US and in the immediate months following 9/11, numerous reports circulated of impending terrorist attacks on the US using CBRN weapons. Thus, in 2002, US President George W. Bush ordered that nuclear terrorism was to be given priority over every other threat to the US.<sup>34</sup>

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<sup>31</sup> The White House, “A National Security Strategy For A New Century,” *The Administration of President William J. Clinton*, December 1999.

<sup>32</sup> The White House, “A National Security Strategy For A Global Age,” *The Administration of President William J. Clinton*, December 2000.

<sup>33</sup> Cole, p. 1.

<sup>34</sup> *Ibid.*, p. 3.

As such, in Bush's 2002 State of the Union Address, he claims that, "States like these [Iran, Iraq, North Korea], and their terrorist allies, constitute an axis of evil, arming to threaten the peace of the world. By seeking weapons of mass destruction, these regimes pose a grave and growing danger. They could provide these arms to terrorists, giving them the means to match their hatred."<sup>35</sup> Bush's national security advisor, Condoleeza Rice, echoed these sentiments and uncertainty over Saddam Hussein's access to and willingness to use WMDs in the case for war against Iraq.<sup>36</sup>

Following 9/11, the severity of the rhetoric on nuclear terrorism is dramatically amplified. In *The National Security Strategy of the United States of America*, published September 2002, Bush states that, "the gravest danger our Nation faces lies at the crossroads of radicalism and technology. Our enemies have openly declared that they are seeking weapons of mass destruction, and evidence indicates that they are doing so with determination." Whereas previous National Security Strategies under President Clinton had limited references to nuclear terrorism, the 2002 version had two of its nine chapters (3<sup>rd</sup> and 5<sup>th</sup>) devoted to the issue of global terrorism and WMDs.<sup>37</sup> Alarmism over nuclear terrorism can also be observed through the documented examination of 85 foreign policy experts by Senator Richard Lugar in 2004/2005. As a result of this inquiry, it was concluded that there was a 29% likelihood of a nuclear explosion taking place somewhere in the world within the next ten years by terrorists.

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<sup>35</sup> The White House, "President Delivers State of the Union Address," *The Administration of President George W. Bush*, 29 January 2002, Date of Access: 21 October 2013, <http://georgewbush-whitehouse.archives.gov/news/releases/2002/01/20020129-11.html>.

<sup>36</sup> Full quote is, "...the problem here is that there will always be some uncertainty about how quickly he [Saddam Hussein] can acquire nuclear weapons. But we don't want the smoking gun to be a mushroom cloud... There is certainly evidence that Al-Qaida people have been in Iraq. There is certainly evidence that Saddam Hussein cavorts with terrorists... we know that he is acquiring weapons of mass destruction, that he has extreme animus against the US."

CNN, "Interview With Condoleeza Rice; Pataki Talks About 9-11; Graham, Shelby Discuss War on Terrorism," *CNN*, 8 September 2002, Date of Access: 21 October 2013, <http://transcripts.cnn.com/TRANSCRIPTS/0209/08/le.00.html>.

<sup>37</sup> The White House, "The National Security Strategy of the United States of America," *The Administration of President George W. Bush*, September 2002.

The first two pages of the updated 2006 *National Security Strategy of the United States of America* are heavily laden with references to the fight against terrorism and non-proliferation of WMDs. Delving deeper into the text, terrorism and WMD proliferation are issues of prominence within the national security strategy. These issues retained their prominence within the entirety of the document itself, once again ranking third and fifth within the ten chapter-long document.<sup>38</sup>

It should come as no surprise that, following 9/11, given the rise in attention paid by the international community to the possibility of future terrorist attacks using WMDs, the US administration would have ramped up the rhetoric on this issue. The 2002 and 2006 focus within the National Security Strategies on the issue of nuclear terrorism is consistent with this elevated rhetoric. However, it is also important to note that the National Security Strategy remains first and foremost, a tool used by the current administration to justify and further its own political agenda.

For the Bush Administration, having entered into the quagmire of an intervention in Afghanistan and a disastrous war in Iraq on the false pretense of securing Saddam Hussein's arsenal of WMDs, it was necessary for them to take measures to ensure that they could continue to legitimize their increasingly unpopular overseas excursions. By tying in Afghanistan and Iraq with the national security objectives of combating terrorism and securing WMDs around the world, the Bush administration sought to reverse some of the damage that had been wrought on the credibility of the US during the past few years.

President Barack Obama took office in November 2008 and inherited a mixed bag of issues to deal with from the previous administration. As such, Obama did not directly address the issues of nuclear terrorism, nuclear safety or nuclear security until April 2009, when in

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<sup>38</sup> The White House, "The National Security Strategy of the United States of America," *The Administration of President George W. Bush*, March 2006.

Prague he gave a speech in which he stated, “the threat of global nuclear war has gone down, but the risk of a nuclear attack has gone up...Black market trade in nuclear secrets and nuclear materials abound. The technology to build a bomb has spread. Terrorists are determined to buy, build or steal one.” Obama proceeded with tying in the need to “ensure that terrorists never acquire a nuclear weapon,” with “our ultimate survival.” This was the speech which launched the Nuclear Security Summit process, a 4-year international effort to secure all vulnerable nuclear material around the world,<sup>39</sup> which is a key mechanism by which countries are undertaking global efforts to combat nuclear terrorism. Less than a year later, at the inaugural session of the Nuclear Security Summit in Washington DC in April 2010, Obama would go on to say that the prospect of nuclear terrorism is, “the single biggest threat to US security, both short-term, medium-term and long-term...this is something that could change the security landscape of this country and around the world for years to come.”<sup>40</sup>

In 2008, the Congress-appointed Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism issued a report, entitled “World at Risk,” in which the report’s authors indicate that although they “did not intend to frighten [readers] about the current state of terrorism and weapons of mass destruction,” they failed, given that Representative Ellen Tauscher, chairwoman of the Strategic Forces Subcommittee of the House Armed Services Committee, proclaimed that it “scared the pants off of most of us.”<sup>41</sup> The report went on to express the belief that “unless the world community acts decisively and with great urgency, it is

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<sup>39</sup> The White House, “Remarks by President Obama,” *The White House, Office of the Press Secretary, The Administration of President Barack Obama*, 5 April 2009, Date of Access: 21 October 2013, [http://www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered).

<sup>40</sup> David Jackson, “Obama: Nuclear terrorism is ‘the single biggest threat’ to U.S.,” *USA Today*, 11 April 2010, Date of Access: 21 October 2013, <http://content.usatoday.com/communities/theoval/post/2010/04/obama-kicks-off-nuclear-summit-with-five-leader-meetings/1#.UmWj0fnBN8F>.

<sup>41</sup> Mueller, *Atomic Obsession*, p. 182.

more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013.”<sup>42</sup>

It was upon the backdrop of these key events that the May 2010 *National Security Strategy* was published. This was the first national security strategy published by the Obama Administration and it greatly differed from its predecessors. The preface contained no references to the issue of nuclear terrorism and/or WMD proliferation, and in fact, was not referenced until much further within the document whereupon which the chapter entitled “Reverse the Spread of Nuclear and Biological Weapons and Secure Nuclear Materials” begins with, “The American people face no greater or more urgent danger than a terrorist attack with a nuclear weapon.”<sup>43</sup>

At first glance, this might indicate that the issue of nuclear terrorism has faded from predominance within the US national security agenda. On the contrary however, the government rhetoric persisted at the same level of alarmism in other venues. At the opening plenary session of the 2012 Nuclear Security Summit, Obama labelled nuclear terrorism as, “one of the most urgent and serious threats to global security,” and that, “there are still too many bad actors in search of these dangerous materials, and these dangerous materials are still vulnerable in too many places.”<sup>44</sup>

Within this brief examination of government language on the issue of nuclear terrorism in the post-9/11 period, it can be observed that the threat of nuclear terrorism remains a priority issue. However, hyperbole and alarmist language predominate discussions on this issue, which, when coupled with the publication of doomsday scenarios and increased media focus on terrorist

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<sup>42</sup> Mueller, *Atomic Obsession*, p. 182.

<sup>43</sup> The White House, “National Security Strategy,” *The Administration of President Barack Obama*, May 2010.

<sup>44</sup> The White House, “Remarks by President Obama at Opening Plenary Session of the Nuclear Security Summit,” *The White House, Office of the Press Secretary, The Administration of President Barack Obama*, 26 March 2012, Date of Access: 21 October 2013, <http://www.whitehouse.gov/the-press-office/2012/03/26/remarks-president-obama-opening-plenary-session-nuclear-security-summit>.

attempts to acquire nuclear weapons; further inflates the problem and prevents a clear understanding of the reality of the situation. As Levi writes, “worst-case estimates have their place, but the possible failure-averse, conservative, resource-limited five-foot-tall terrorist, who is subject not only to the laws of physics but also to Murphy’s law of nuclear terrorism” should also be included as a subject of evaluation.<sup>45</sup>

## **An Aggregation of Arguments for Alarmism**

Within the contemporary literature on nuclear terrorism, it is possible to identify several key assumptions upon which alarmist proponents have based their arguments about the immediate threat posed by nuclear terrorism. These assumptions can be categorized into two different streams: with the first stream dealing with changes in the structure of the global nuclear environment while the second stream focuses on concrete and technical developments in nuclear technology.

### **The First Stream – The Changing Structure of the Global Nuclear Environment**

Dating back to the 1990s, there has been an increase in the perceived threat from nuclear terrorism that stems from three core assumptions about the global nuclear environment:<sup>46</sup>

1. Technologically, it is becoming increasingly possible for terrorist groups to develop nuclear weapons.

Nuclear fission has come a long way since its genesis in the 1940s. Arguably, science and technology have advanced to the point where the production of quantities of HEU or plutonium (Pu) can be undertaken at lower financial and time costs than previously thought

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<sup>45</sup> Michael Levi, *On Nuclear Terrorism*, Cambridge: Harvard University Press, 2007.

<sup>46</sup> Cole, p. 3-4.

possible. Furthermore, the open accessibility of the internet and the vast amount of readily available information means that terrorist groups have numerous sources to consult in their pursuit of acquiring a nuclear weapon.

2. The increasing lethality of terrorist attacks, the rise of “religious” terrorism and the increased use of CBRN weapons by terrorist groups, indicate that further terrorist incidents involving CBRN weapons and WMD are inevitable.

The rise of political-religious terrorist organizations and their seeming willingness to shift their terrorist activities away from conventional attacks towards CBRN-oriented attacks (sarin gas, anthrax powder, etc.) means that they are only one step away from making the leap to using nuclear weapons as an attack weapon. Furthermore, the increasing desirability observed among terrorist organizations to attempt sensational attacks on high-profile targets indicate that use of nuclear weapons will not remain an option that is off the table.

3. The political, theological, tactical and strategic disincentives to using CBRN weapons and perpetrating acts of mass destruction are weakening, whilst the political, theological, tactical and strategic motivations to use CBRN weapons are increasing, for a greater number of groups.

The threat of terrorism no longer runs along the lines of state to state conflict. Instead, modern terrorist organizations are fluid and dynamic networks that are spread out across an area and as such have no “return address,” at which they can be found and targeted.<sup>47</sup> In their use of asymmetrical fighting strategies, the fear of reprisal is no longer a strategic disincentive for terrorist organizations as they can be spread out over a large area and as such, this creates difficulties for a state that wishes to attempt a retaliatory attack. Furthermore, terrorist groups – especially those of a political-religious nature, cannot be deterred by the mere application of a

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<sup>47</sup> Gavin.

deterrence strategy. As non-state actors who have embraced suicide attacks, these groups do not behave in the same manner as a State. The rational decision-making model is absent from the decision-making process of terrorists.<sup>48</sup>

The constraints on the use of CBRN materials has also seemingly been lowered with the desire of some terrorist groups to engage in high-profile sensational strikes against targets which, in some cases have symbolic, rather than monetary value. The destructive power of CBRN weapons means that any attack will be far more successful and efficient in comparison to conventional attacks. The precedent set with the use of chemical and biological weapons (CBW) against indiscriminate population targets imply that the use of nuclear or radiological weapons is the next logical step for terrorists to take.<sup>49</sup> However, it is important to note that although there is an identified correlation between terrorists with political-religious ideology and the use of CBRN weapons, overarching generalizations cannot be made about all the religious terrorist groups. In fact, past history has shown that not “all religious terrorist groups are interested in CBRN weapons [with] only a small number of groups have[ing] ever made a systematic attempt to procure them.”<sup>50</sup>

### **The Second Stream – Technical and Concrete Developments in Nuclear Technologies**

A second stream of six assumptions arise from developments and changes that have occurred within the concrete, technical and physical realities relating to nuclear material stockpiles, nuclear material development and overall WMD-proliferation:<sup>51</sup>

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<sup>48</sup> Jaspal.

<sup>49</sup> Cole, p. 28.

<sup>50</sup> Ibid., p. 30-31.

<sup>51</sup> Robin M. Frost, *Nuclear Terrorism After 9/11*, Oxon: Routledge, 2005, p. 7-8.

1. The Russian nuclear arsenal, inherited from the Soviet Union, is so poorly secured that it has become an enormous “Nukes-R-Us,” staffed by corrupt, demoralised and underpaid military, and patronised by terrorists and their criminal henchmen.

The fear of Russian nuclear materials finding their way into the arsenals of terrorists has an exhaustive body of accompanying documented research. This research highlights issues such as the inadequate security at Russian facilities, problems with the Russian civil and military nuclear infrastructure, endemic corruption, weaknesses within the Russian bureaucracy and the criminalization of Russian society which has, “created conditions which increase the incentives and opportunities to smuggle nuclear material out of the country.”<sup>52</sup> These incentives extend to scientists of the Former Soviet Union who are at risk of being co-opted and absorbed into terrorist networks, providing them with their expertise and scientific know-how.

2. There is a thriving international black market in nuclear weapons and materials;<sup>53</sup>

It is assumed that the international black market which exists for conventional weapons also functions as a clearing house for the underground and illegal sale of nuclear material. Furthermore, it is also presumed that international organized crime has involved itself in this market, which provides those who wish to deal in nuclear materials a well-connected illegitimate network through which to conduct operations.

3. The plans and technical information necessary to build a functional nuclear weapon are widely available;

This argument is predicated on the fact that the internet serves as a giant repository for a wide variety of information. The tentative plans and basic technical information necessary for the production of a functional nuclear weapon is available on the internet.

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<sup>52</sup> Cole, p. 48.

<sup>53</sup> Jaspal.

4. Some so-called rogue states, especially Pakistan and North Korea (or entities within them), are willing to give or sell nuclear weapons to terrorists, if they have not already done so;

This assumption is based on the fear that rogue regimes will willingly provide terrorist with the weapons or material necessary for them to carry out a nuclear attack. In this respect, regimes such as Iran, Pakistan or North Korea are expected to provide the requisite assistance, technology and materials to terrorist groups looking to engineer a nuclear weapon. In the assumptions reference to “entities within them,” networks such as the AQ Khan Network are identified as conduits for technological transfer. The AQ Khan network refers to revelations that Abdul Qadeer Khan, one of Pakistan’s top nuclear scientists, provided information and technical advice to the Iranian and North Korean nuclear programmes. There are fears that such networks may evolve in the future to not only facilitate the transfer of nuclear infrastructure knowledge but also the transfer of materials or a weapon.

5. Lack of sufficient security capacities in both stable and unstable states to maintain control over nuclear arsenals and at civilian and military nuclear facilities;

The primary concern that is exemplified through this assumption is the fear that if a nuclear weapon state were to collapse, the resulting transitional authority would not have the capacity to keep its nuclear weapons secure and prevent terrorist acquisition, most notably with respect to Pakistan and North Korea. Furthermore, the latter half of this assumption stem from issues of personnel reliability and site security at civilian and military nuclear installations. For example, in March 2010, Yemeni law enforcement agencies arrested a US citizen as an Al-Qaeda agent who had worked in the US nuclear industry for over six years, having passed all

requisite federal security background checks.<sup>54</sup> In addition to this, there have been documented incidents where protestors or anti-nuclear activists were able to access nuclear facility grounds.

For example, in November 2007, four armed men broke into South Africa's Pelindaba nuclear depository facility but left without stealing any nuclear material. In February 2010, six anti-nuclear activists climbed over a fence at the Kleine Brogel military base in Belgium, walking around for an hour before they were arrested.<sup>55</sup> In 2013, 30 Greenpeace activists managed to break into a nuclear power plant in southern France.<sup>56</sup> Even the US is not immune to these shortfalls, as in 2012, three intruders, including a 72-year old nun, were able to break into the Y-12 nuclear weapons plant<sup>57</sup> while in 2013 a motorist was able to wander onto the grounds of the facility before being accosted and removed.<sup>58</sup>

6. The greatest potential threat is from terrorists using true nuclear weapons, but “dirty bombs” could also be extremely dangerous, especially if they use substances such as uranium or plutonium.

This assumption is based off the fact that terrorists are unable to muster the necessary resources to engineer a nuclear weapon or nuclear device and as such may resort to the use of a “dirty bomb” to carry out their attack instead.

This MRP provides no argument against the three assumptions found within the first stream, as all three of these assumptions hold true. However, although the environment has changed to become more favourable for the use of nuclear weapons by terrorists, the fact of the

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<sup>54</sup> Jaspal.

<sup>55</sup> Ibid..

<sup>56</sup> Natalie Huet and Emmanuel Jarry, “Greenpeace activists break into French nuclear plant,” *Reuters*, 15 July 2013, Date of Access: 21 October 2013, <http://www.reuters.com/article/2013/07/15/us-france-nuclear-greenpeace-idUSBRE96E04B20130715>.

<sup>57</sup> Erik Schelzig, “Jury finds 3 guilty of Y-12 break-in,” *The Oak Ridger*, 9 May 2013, Date of Access: 21 October 2013, <http://www.oakridger.com/article/20130508/NEWS/130509889>.

<sup>58</sup> Bob Fowler, “Police report: Motorist drives through Y-12 entrance, across plant site,” *Knox News*, 7 June 2013, Date of Access: 21 October 2013, <http://www.knoxnews.com/news/2013/jun/07/police-report-motorist-drives-through-y-12-plant/>.

matter remains that nuclear terrorism, is by and large, overwhelmingly subject to possessing the appropriate technological and scientific capacities. As such, the invalidation of the second stream's assumptions mitigates the threat.

### **Analysis: Active and Passive Nuclear Terrorism**

This section discusses terrorist efforts to acquire either a nuclear weapon or nuclear material. It also examines terrorist efforts to co-opt existing nuclear facilities or existing radiological sources as a method by which to carry out an attack. As such, this section will serve to invalidate the assumptions derived from recent technical/concrete developments, specifically #s 1 through 3, 5 and 6.

### **The Problem of the Future**

Future terrorist incidents involving the use of CBRN weapons is probably inevitable, given the ease by which terrorists can acquire components to manufacture both chemical and biological weapons. However, there is no strong case for the assumption that the threat of a future terrorist incident involving a nuclear weapon or device is also inevitable. To date, no terrorist group has established itself as a credible threat of nuclear terrorism, with Aum Shinrikyo's success in 1995 remaining "an isolated case."<sup>59</sup> However, terrorist organizations have been documented in their desire to get their hands on a nuclear weapon. Al-Qaeda has stated that it is of imperative importance that the group acquire nuclear capabilities and they

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<sup>59</sup> Cole, p. 28.

believe that, “the use of WMDs would bring about a severe reprisal by the USA that would garner more support for the Islamists within the Muslim world.”<sup>60</sup>

The analysis in this section proceeds off of the assumption that a rogue regime or nuclear state will not deliberately supply nuclear materials to a terrorist group. Instead, this section will focus on several formally identified sources from which terrorists could seek to acquire nuclear weapons or materials: including Russia (both military and civilian), Pakistan, North Korea or the global nuclear black market (through sale, an AQ Khan-type network), or the existence of nuclear research reactors, storage facilities and hospitals using radiological sources.<sup>61</sup>

### Active Terrorism – Theft

For the theft of a nuclear weapon, a terrorist has an option among some twenty thousand nuclear bombs, ranging over several hundred models that exist in the global inventory. Realistically however, if terrorists were to attempt to steal a nuclear weapon it would be a tactical nuclear weapon designed to be delivered by a single soldier from the arsenal of current nuclear weapon states,<sup>62</sup> which in addition to an estimated global stockpile of fissile material enough to build 120,000 Hiroshima-sized nuclear bombs,<sup>63</sup> implies that terrorists have a wealth of sources that they could leverage. Furthermore, given that all nuclear weapon states hold stockpiles and that there is an “international trade in nuclear materials with nuclear reactor fuel

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<sup>60</sup> Sammy Salama and Lydia Hansell, “Does intent equal capability? Al-Qaeda and weapons of mass destruction,” *Nonproliferation Review*, Vol. 12, No. 3 (November 2006), p. 625-626.

<sup>61</sup> Graham Allison, *Nuclear Terrorism*, New York: Times Books, 2004, p. 61-86.

<sup>62</sup> *Ibid.*, p. 46-49.

<sup>63</sup> Fissile Materials Working Group, “Fact Sheet: 2010 Nuclear Security Summit & “Next Generation Nuclear Security” Parallel Summit,” *Fissile Materials Working Group*, Date of Access: 21 October 2013, <http://www.fmwg.org/SiteFiles/FMWG%20-%20Press%20Fact%20Sheet.pdf>.

being transported globally,” there are numerous potential opportunities for terrorists to attempt to steal nuclear material.<sup>64</sup>

When it comes to theft, the primary fear among alarmists stems from the perception that the Russian arsenal is poorly defended and materials at facilities scattered throughout the former USSR are poorly secured and vulnerable to theft. On the contrary however, Russian nuclear weapons are found to be under the good control of elite troops hailing from the 12<sup>th</sup> Main Directorate, having similar functions and capacities as the US’ Defense Nuclear Agency.<sup>65</sup> To date, the only unsecured sources of Russian nuclear material lie in the hulks of nuclear submarines on the ocean floor, inaccessible to salvage operations, let alone any terrorist attempt to recover them. These concerns were most apparent during the disintegration of the former Soviet Union, as due to the “chaos and turbulent times,” there was fear that the authorities would lose control over their nuclear material stockpiles. As history has shown however, nuclear weapons are of extreme importance to a nuclear weapon state, and this is enough to ensure that their stockpiles remain uncompromised, even during periods of transition or instability.<sup>66</sup>

Pakistan is another potential source of theft due to its precarious state as a nation on the brink of losing control, giving rise to fears that weapons from its stockpile could become readily accessible to terrorists looking to acquire them. However, Islamabad has always reiterated that it has, “institutionalized numerous precautionary measures to guarantee that these weapons would be remained [sic] out of the reach of the transnational terrorist groups during chaos or political

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<sup>64</sup> Cole, p. 49.

<sup>65</sup> Glavnoye Upravleniye Ministerstvo Oborony (GUMO), Frost, p. 19.

<sup>66</sup> Jaspal.

crisis.”<sup>67</sup> Pakistan has installed sophisticated firing mechanisms as well as instigated Personnel and Human Reliability Programmes to prevent its nuclear personnel from being infiltrated.<sup>68</sup>

As such, there is no evidence in open-source material that, “a single nuclear warhead from any national arsenal or another source, has ever made its way into the world’s illegal arms bazaars, let alone into terrorist hands.”<sup>69</sup> Even if a nuclear weapon was acquired by a terrorist organization it would not be able to access the device due to the built in protective code systems that accompany such devices.

### Active Terrorism – Purchasing

“There is no evidence in open-source literature of the existence of an international black market for nuclear materials. Virtually all known cases of nuclear theft or smuggling have involved amateurs hoping for rich returns. The market is entirely driven by supply, there is no true demand. Organized crime has not gotten involved in nuclear trafficking.”<sup>70</sup> Even if terrorists were able to acquire a nuclear weapon or device through the nuclear black market the logistical and technical difficulties in delivery and detonation would still prove insurmountable for terrorist groups.<sup>71</sup> The potential sources from which a terrorist organization could purchase a nuclear weapon span the globe. Even though “many assume that nuclear weapons or materials are either too well guarded for a thief to obtain or too dangerous for an insider to contemplate selling,” documented cases of Pakistani meetings with Al-Qaeda, the revelations about the AQ Khan network and the fear of “impoverished Russian scientists,” continue to drive these fears.<sup>72</sup>

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<sup>67</sup> Jaspal.

<sup>68</sup> Ibid.

<sup>69</sup> Frost, p. 8.

<sup>70</sup> Ibid., p. 8-9.

<sup>71</sup> Gavin.

<sup>72</sup> Allison, *Nuclear Terrorism*, p. 85.

It is important to note that there has been no documented evidence to prove that Al-Qaeda has attempted to obtain fissile material or “ever has had a serious and sustained program to do so.”<sup>73</sup> However, the continued close relationship between “elements of the Pakistani armed forces and their Inter-Services Intelligence Directorate (ISI) and the former Al-Qaeda regime in Afghanistan,” in addition to “strong Islamist sentiments still held by many members of the Pakistani armed forces,”<sup>74</sup> remains a cause for concern. However, Pakistan has undertaken a number of unilateral and multilateral initiatives to shore up the security of its nuclear programme out of fear of punishment from potentially being the state which provides terrorists with the means by which to instigate a nuclear attack. In addition, the AQ Khan network was based on the proliferation of nuclear technology to states that were pursuing illegal nuclear programmes and not on the sale of nuclear materials.<sup>75</sup> There is no evidence to suggest that any such network is currently operating. As such, the fears of alarmist with regards to terrorists purchasing the materials necessary for a nuclear attack are unfounded.

Furthermore, if terrorists were able to purchase fissile materials, they would still have to find a way to transport the materials from point of purchase, to assembly point, to destination point. There are a number of initiatives set up in order to prevent such transit from being possible. Through the Global Initiative to Combat Nuclear Terrorism (GICNT), the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (GP), the US’ National Nuclear Security Administration’s (NNSA) Megaports initiative and INTERPOL; countries identified with major transshipment points have had their transport and maritime security infrastructure upgraded and supplemented with equipment to detect the transfer of

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<sup>73</sup> Dana Priest and Josh White, “War Helps Recruit Terrorists, Hill Told,” *Washington Post*, 17 February 2005, Date of Access: 21 October 2013, <http://www.washingtonpost.com/wp-dyn/articles/A28876-2005Feb16.html>.

<sup>74</sup> Frost, p. 55-56.

<sup>75</sup> *Ibid.*, p. 9.

nuclear material. Such safeguards, in addition to the implementation of norms across the global nuclear industry through the Nuclear Suppliers Group, the Wassenaar Arrangement and the Zangger Committee have ensured that the highest standards are applied to global transport infrastructure. Security is geared to facilitate the safe and secure transport of authorized nuclear materials while detecting, interdicting and preventing any illegal transfers of material.

Finally, the largest piece of the global infrastructure to prevent the illegal transfer of nuclear material can be found in the IAEA's Incident and Trafficking Database (ITDB), which comprises 124 state participants and provides a comprehensive worldwide network to detect and prevent any unauthorized and illegal attempts to traffic nuclear materials. Between 1993 and 2012, there were a total of 2,331 incidents that were reported by participating States and some non-participating States. Of these 2,331 incidents, 419 were found to involve unauthorized possession and/or criminal activity. Of these 419 incidents, 16 were found to involve HEU or Pu. In total, there were 615 incidents reported that involved the theft or loss of nuclear or other radioactive material and a total of 1,244 cases involving other unauthorized activities, including the unauthorized disposal of radioactive materials or discovery of uncontrolled sources.<sup>76</sup> The total for all IAEA-confirmed trafficking cases involving HEU was just 8.35kg, with the total amount of Pu at 374.3g.<sup>77</sup> With the number of cases that have been documented and still no indications that terrorists currently pose a credible nuclear threat, it is safe to assume that there is a high success rate for both detection and intervention.

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<sup>76</sup> IAEA, "Incident and Trafficking Database," IAEA, 20 August 2013, Date of Access: 21 October 2013, <http://www-ns.iaea.org/security/itdb.asp>.

<sup>77</sup> Frost, p. 13.

### Active Terrorism – Self-Construction

Given the extreme difficulties and risk associated with attempting to steal or purchase nuclear weapons from a state, terrorists are left with the only remaining option of attempting to construct a weapon by themselves.<sup>78</sup>

A scientific evaluation of the necessary capacities required by a terrorist organization to produce fissile materials found that, “acquisition of natural uranium by terrorists should be straightforward,” as “electromagnetic and laser separation techniques...do not require large investment and expense if the purpose is to produce limited quantities of weapons-grade uranium.”<sup>79</sup> The evaluation also concluded that the diversion or theft of U-235 or Pu-239 from national military weapons program or from the civilian fuel cycle (manufacture, shipment, use, processing) associated with research and commercial nuclear reactors is the primary way by which to acquire these materials.<sup>80,81</sup>

However, the actual design and production of workable materials for an explosive weapon requires “sophisticated analysis and synthesis [and] is a work for serious professionals.” The evaluation goes on to say that a team would have to include “3-5 scientists and engineers, with diverse expertise in nuclear physics and engineering, metallurgy, explosives and electronics” as a minimum with “access to computers, good laboratories, machine shops and testing facilities.”<sup>82</sup> Given the very specific mix required in assembling a capable team, terrorist groups might have difficulty in having members among their ranks with such diverse and specific technical skills. However, it must be noted that the acquisition of such expertise could

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<sup>78</sup> Cole, p. 47.

<sup>79</sup> Sudarshan K. Loyalka and Mark A. Prelas, “Nuclear Terrorism: Threats and Countermeasures,” in Tushar K. Ghosh, Mark A. Prelas, Dabir S. Viswanath, and Sudarshan K. Loyalka, *Science and Technology of Terrorism and Counterterrorism*. Boca Raton: Taylor & Francis Group, 2002. P. 285-292, p. 286.

<sup>80</sup> Cole, p. 36.

<sup>81</sup> Loyalka, “Nuclear Terrorism: Threats and Countermeasures,” p. 286.

<sup>82</sup> *Ibid.*, p. 287.

conceivable be completed given that such skills can be found in the general scientific and technical community.<sup>83</sup>

Nuclear weapons are extremely difficult to manufacture and it should be noted that, “nuclear weapons are so controversial and expensive that only countries that deem them to be absolutely critical to their survival go through the extreme trouble of acquiring them...why South Africa, Ukraine, Belarus and Kazakhstan voluntarily gave them up in the early 1990s, and other countries like Brazil and Argentina abandoned their nascent programs.”<sup>84</sup> Even for existing nuclear weapon states, the process of manufacturing fissile nuclear material remains extremely difficult and as such, it would be extremely difficult for any terrorist organization and their respective organizational capacities to do so. It is therefore inconceivable that a terrorist group would be able to easily produce its own supplies of Pu or HEU.<sup>85</sup> Reports that Al-Qaeda in the Maghreb (AQIM) operatives were killed while attempting to manufacture much simpler and less complicated CBW is a positive sign that the technical capabilities of Al-Qaeda are nowhere near strong enough to proceed to nuclear weapons.<sup>86</sup> However, a distinction must be made between the “finely engineered military weapons with high explosive yields which states to seek to develop and the much cruder devices with low yields with which terrorists would be satisfied.”<sup>87</sup>

At an absolute minimum however, terrorists would need to acquire roughly 5-6kg of Pu-239 or 25kg of HEU (94% U-235). Depending on the sophistication of technology available to the terrorists, the requisite quantities could be reduced to either 6kg of Pu/16kg of HEU or 3kg of

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<sup>83</sup> Cole, p. 37.

<sup>84</sup> Jonathan Tepperman, “Why Obama Should Learn to Love the Bomb,” *Newsweek*, 29 August 2009, Date of Access: 21 October 2013, <http://www.newsweek.com/id/214248>, as cited in Jaspal.

<sup>85</sup> Cole, p. 47.

<sup>86</sup> Todd Masse, “Nuclear Terrorism Redux: Conventionalists, Skeptics, and the Margin of Safety,” *Foreign Policy Research Institute*, Spring 2010, p. 302-319, p. 317.

<sup>87</sup> Cole, p. 35.

Pu/5kg of HEU.<sup>88</sup> All in all though, the development of a nuclear weapon would not be cheap, with costs dependent on the nature and scale of any attempt to develop a weapon.

Documentation from the 1990s show that, “HEU was being offered at prices between \$1 million and \$60 million USD while Pu-239 was being offered at prices between \$700,000 and \$1 million USD – though none of the quantities involved were sufficient for critical mass [necessary for a nuclear weapon].”<sup>89</sup>

Finally, the development of a nuclear weapon is not without risk. In fact, the amount of coordination, exposure and outreach required on the part of terrorists to acquire all these components for manufacture means that they will be operating at a high-profile. Since terrorists generally tend to be risk averse in the conduct of operations, “prioritizing the survival of the group as an overriding imperative,”<sup>90</sup> there is a great disincentive to use nuclear weapons.

### Active Terrorism – Weaponization and Delivery

Ultimately, assuming that terrorists were able to acquire a nuclear device through the previously explored methods, the next stage of the process for terrorists is to figure out a way to weaponize and deliver the nuclear material to their intended target. The handling of such sensitive materials requires technological expertise.<sup>91</sup> Although the delivery mechanism is not that hard to smuggle once it has been created, given that the core of a nuclear weapon/device is no bigger than an American football and it will not give off a high enough radiation signature to be picked up by everyday detectors, it will, once again, be up to border security infrastructure to ensure that the material does not transit across borders.

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<sup>88</sup> Cole, p. 36.

<sup>89</sup> Ibid., p. 56.

<sup>90</sup> Ibid., p. 88.

<sup>91</sup> Ibid., p. 52-56.

In addition to all this however, an analysis of terrorist motivations show that terrorists have a wide range of tactics and strategies dependent on the outcome they wish to achieve. With that being said, nuclear weapons can be seen to be the weapon of choice for: causing indiscriminate mass casualties against civilian targets, generating propaganda, scenarios in which they can be used to circumvent defences against conventional attack; intimidating public opinion; blackmailing governments; and causing economic damage. However, nuclear weapons, though effective, are not necessarily the best weapons for all of these roles, given a cost-benefit analysis: which indicate that operational and technological requirements for these objectives still heavily favour the use of conventional weapons.<sup>92</sup> CBRN weapons have often been found to be incompatible with a terrorist group's goals, given that they are somewhat responsible to a large constituency of support that would object to the indiscriminate use of violence.<sup>93</sup> Figure 3 (next page) shows a matrix which highlights the necessary resource and organizational requirements necessary for the conduct of various forms of active nuclear terrorism. As can be seen, there are very few terrorist organizations which are capable of carrying out such attacks.

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<sup>92</sup> Cole, p. 87-88 and Frost, p. 46-54.

<sup>93</sup> Rowlands, p. 19.

Figure 3: A matrix showing requirements for nuclear terrorist attack<sup>94</sup>

	<b>Stolen Nuclear Device</b>	<b>Improvised Nuclear Device</b>	<b>Radioactive Release from Nuclear Facility</b>	<b>RDD</b>
<b>Motivation</b>	Extreme; desire to cause mass deaths, destruction; likely limited to apocalyptic and politico-religious groups	Extreme; desire to cause mass deaths, destruction; likely limited to apocalyptic and politico-religious groups	Very high; desire to cause great property damage, disruption, some loss of life	Very high; desire to cause great property damage, disruption, some loss of life
<b>Organizational skills needed</b>	Very high	Very high	Very high	Moderate
<b>Geographic reach needed</b>	Multicountry capability required to detonate Russian, Pakistani, or Indian device in US	Multicountry capability required to detonate device built from foreign-origin, weapons-usable, fissile material in US	Single country	Single country sufficient
<b>Financial resources needed</b>	High	High	Moderate to high	Modest
<b>High</b>	High	High; moderate for some scenarios	Moderate to high	Modest
<b>Number of groups (as of 2004) with capability</b>	Few; (possibly none currently able to meet all criteria for foreign country incident)	Few; (possibly none currently able to meet all criteria for foreign country incident)	10+	10s-100s

### Passive Terrorism – Radiological Dispersal Devices (RDD)

The purpose of a radiological weapon is to spread radioactive contamination in an effort to disrupt and cause fear. As such, these weapons are sometimes referred to as Weapons of Mass Disruption. There is a general consensus that this remains “a much easier option for terrorist groups... combining conventional explosives with radioactive materials... have[ing] a psychological impact at least equal to 9/11.”<sup>95</sup> The radiological weapon would have substantial effects, even without causing immediate, large-scale loss of life as it serves the terrorist’s

<sup>94</sup> Ferguson, *The Four Faces of Nuclear Terrorism*, p. 38-39.

<sup>95</sup> Jaspal.

objectives by having a devastating psychological impact due to the fear of cancer and other leftover effects on the areas contaminated by the dispersed materials.<sup>96</sup> The “economic, social and psychological effects of a dirty bomb could be considerably more serious than its physical or radiological effects.”<sup>97</sup> In addition to all this, the use of RDDs would meet multiple goals that terrorists might have. For example, the use of an RDD could result in prompt casualties, the spread of panic, economic disruption, asset denial, inflicting high costs of decontamination and long-term casualties resulting from exposure to radioactive material.<sup>98</sup>

The construction of such a device requires no special skills apart from the knowledge of protecting oneself from the radioactivity during assembly. In order to maximize the amount of harm inflicted upon the targeted population, radiological terrorists would need to seek very highly radioactive sources that pose external and internal health hazards with suitable isotopes being strontium-90, caesium-137 and cobalt-60,<sup>99</sup> all of which are relatively accessible at civilian hospitals.<sup>100</sup> An RDD would conceptually consist of a conventional explosive core which aims to disperse radioactive material over a large area. Drawing upon the information presented thus far, it seems quite easy for terrorists to engage in an RDD attack, and when conflated with overblown rhetoric on the issue, the public “tends to infer threat and probability from feasibility and fears” although it is necessary to note that, “the reality is more complex.”<sup>101</sup>

Terrorists would not find it difficult to come up with the material for a conventional explosive. The hard part of manufacturing an RDD would be acquiring the radioactive material. In this regard, efforts are being undertaken to establish a global inventory of radiological

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<sup>96</sup> Jaspal.

<sup>97</sup> Frost, p. 9.

<sup>98</sup> Jonathan Medalia, “‘Dirty Bombs’: Technical Background, Attack Prevention and Response, Issues for Congress,” *Congressional Research Service*, 24 June 2011, p. 10-11.

<sup>99</sup> Cole, p. 39-40.

<sup>100</sup> *Ibid.*, p. 49.

<sup>101</sup> Medalia, p. 11.

sources: active, orphaned and depleted – so as to ensure accountability. Furthermore, the few remaining countries who still have radiological source producing industries are being strongly encouraged and assisted through the IAEA to make the transition of using Low-Enriched Uranium (LEU) targets instead of HEU targets for production. Finally, efforts are also underway to ensure higher security at hospitals and civilian facilities where such radiological sources may be used and stored. As such, much action is being undertaken in order to prevent terrorists from being able to acquire the material necessary to make an RDD.

However, if terrorists were able to acquire a radiological source, there are still numerous difficulties when it comes to weaponizing and delivering an RDD. Transport of radiological sources would require terrorists to move through major transshipment points at which the aforementioned detection technologies would be able to spot them doing so. Furthermore, during construction, the terrorists would have to take great care to ensure that avoid receiving lethal doses of ionizing radiation by building an adequate shielding structure, but doing so would “substantially increase the difficulty in transporting an RDD and could dissuade terrorists from employing these types of sources.”<sup>102</sup> Furthermore if terrorists use the wrong type of isotope the effects of their attack would be severely mitigated. Various forms of radiation cause damage in different ways, while the half-lives of radioactive materials could mean that RDDs could be inert and useless with the wrong materials.<sup>103</sup> Ultimately however, an RDD attack is not guaranteed to be effective, and as such terrorists are taking the risk that they risk exposure of their activities for no gain.

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<sup>102</sup> Charles D. Ferguson, Tahseen Kazi, and Judith Perera, “Commercial radioactive sources: surveying the security risks,” *Disarmament Forum*, No. 2 (2003), as cited in Jaspal.

<sup>103</sup> Medalia, p. 14-15.

### Passive Terrorism – Existing Nuclear Infrastructure

Another aspect that is covered under the label of passive terrorism is the possibility that terrorists might want to use Nuclear Power Plants (NPPs), weapon-material production sites, plutonium separation facilities or radioactive waste storage sites as weapons. This has been identified as a “realistic” threat.<sup>104</sup> In the US, incidents at Three Mile Island and Chernobyl have created an “aura of wariness around nuclear power plants.” The meltdown at the Three Mile Island reactor resulted in the exposure of 2 million people to small doses of radiation. Chernobyl resulted in the direct deaths of 6,000 and continues to claim thousands of victims through cancer.<sup>105</sup> Both of these incidents were accidents and as such, the prospect of a terrorist crashing an airplane into a nuclear plant or detonating a bomb next to a vulnerable area is “among many people’s worst nightmares.”<sup>106</sup>

A post-9/11 evaluation of US security infrastructure at its NPPs revealed that none of the construction designs had taken into account nuclear security, only nuclear safety. As such, major revisions had been undertaken in order to reshape the ground around facilities in order to ensure that there was a high degree of nuclear security to prevent such attacks. This same trend has taken place worldwide, with numerous initiatives having been undertaken in order to beef up nuclear security at vulnerable installations, most notably under the auspices of the IAEA’s Nuclear Security Fund (NSF).

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<sup>104</sup> Allison, *Nuclear Terrorism*, p. 55.

<sup>105</sup> Ibid.

<sup>106</sup> Jaspal.

## The Countermeasures

There is a list of possible countermeasures against these attempts: protection of nuclear weapons, protection of nuclear materials, control of nuclear transfers, protection of nuclear expertise, destruction of nuclear infrastructure, upgrading of intelligence programs.<sup>107</sup>

Analysts agree that the most effective and least expensive way to prevent nuclear terrorism is to secure weapons and materials at the source. As former Deputy Secretary of Energy Charles Curtis noted, “Acquiring weapons and materials is the hardest step for the terrorists to take, and the easiest step for us to stop. By contrast, every subsequent step in the process is easier for the terrorists to take and harder for us to stop. Once they gain access to materials, they’ve completed the most difficult step.”<sup>108</sup> Even if a terrorist group were to acquire a nuclear device, counter terrorism efforts can still prevent catastrophe through effective planning as for nuclear terrorists, what “can go wrong might go wrong, and when it comes to nuclear terrorism, a broader, integrated defense, just like controls at the source of weapons and materials, can multiply, intensify, and compound the possibilities of terrorist failure, possibly driving terrorist groups to reject nuclear terrorism altogether.”<sup>109</sup>

Finally, it is important to note that studies into Al-Qaeda’s interest in the acquisition and use of nuclear weapons have revealed that, “the network’s interest in using unconventional means is in fact much lower than commonly thought.”<sup>110</sup> Terrorism expert Anne Stenersen followed by stating that, “CBRN weapons do not play a central part in Al-Qaeda’s [offensive] strategy,” noting that members of the terrorist network who were in favour of acquiring a nuclear

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<sup>107</sup> Loyalka, “Nuclear Terrorism: Threats and Countermeasures,” p. 288-291.

<sup>108</sup> Nuclear Threat Initiative, “Sam Nunn testifies before the U.S. Senate Committee on Appropriations,” *Nuclear Threat Initiative*, 7 May 2002, Date of Access: 21 October 2013, <http://www.nti.org/analysis/testimonies/sam-nunn-testifies-us-senate-committee-appropriations/>.

<sup>109</sup> Levi, p. 24.

<sup>110</sup> Anne Stenersen, *Al-Qaida's Quest for Weapons of Mass Destruction: The History behind the Hype*, Saarbrücken: VDM Verlag Dr. Müller Aktiengesellschaft, 2008, p. 89.

weapon did so primarily for the purposes of having a sufficient deterrent against any US attack on Al-Qaeda's bases in Afghanistan. Furthermore, "although there have been various reports stating that Al-Qaeda attempted to buy nuclear material in the 1990s, and possibly recruited skilled scientists, it appears that Al-Qaeda central have not dedicated a lot of time or effort to developing a high-end CBRN capability...there was an awareness that militarily effective weapons were extremely difficult to obtain."<sup>111</sup>

It also remains prudent to monitor future marketplaces of illicit nuclear trade which include China, Hong Kong, India, Pakistan, Southeast Asia, Turkey, Brazil, Argentina, Russia, FSU and other rogue regimes. In order to stop illicit trade, initiatives must be undertaken to: build greater awareness against illicit trade; make export controls universal and more effective; promote better enforcement and use of UN, unilateral, and regional sanctions; improve controls over sensitive nuclear information and assets; stop the money flows related to illicit trade; better coordinate prosecutions and more vigorously prosecute smugglers; enhance early detection methods; emphasize interdictions; create a universal standard against illicit nuclear trade; prevent additional developed/industrialized market nations from developing nuclear weapons; reinvigorate a US policy to discourage uranium enrichment and plutonium separation capabilities in regions of tension; gain and verify pledges to renounce illicit nuclear trade; obtain additional state commitments not to proliferate; prevent non-state actors from obtaining nuclear weapons via illicit trade; and, implement relevant arms control agreements and extend security assurances.<sup>112</sup>

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<sup>111</sup> Stenersen.

<sup>112</sup> David Albright, Andrea Stricker, and Houston Wood, "Future World of Illicit Nuclear Trade: Mitigating the Threat," *Institute for Science and International Security*, 29 July 2013.

## Analysis: State-sponsored nuclear terrorism

This section will directly address assumption #4 from the second stream of assumptions for alarmism, focused on technical and concrete developments.

State-sponsored nuclear terrorism is another thematic area from which current fears of nuclear terrorism can be derived from. The examination of state-sponsored nuclear terrorism starts with the initial debate over the deductive and empirical base for claims that nuclear states would always be subject to deterrence as presented by Scott D. Sagan and Kenneth Waltz in their discussion within *The Spread of Nuclear Weapons: A Debate Renewed*.<sup>113</sup> From this discussion, any state which does not adhere to the logic of nuclear deterrence is labelled as “rogue,” in the sense that these states engage in behaviour not consistent with international norms. The hallmarks of this rogue and deviant behaviour would include the issuance of violent threats towards other States; the direct or indirect support of terrorist organizations; and/or committing human rights violations, among others. As such, two rogue regimes can be identified in the contemporary language on nuclear terrorism: North Korea and Iran. Throughout the latter half of the 20<sup>th</sup> century, analysts had consistently projected that nuclear proliferation among small or unstable countries would lead directly to an increase in the “likelihood of nuclear war,” on the basis that these countries would, “act less maturely with nuclear weapons under their belt, thus inevitably leading to regional, and in turn, global, instability.”<sup>114</sup> Yet, the opposite has proven to be true.

When China announced its nuclear program to the world with the test of its first nuclear device in 1964 and after, it exhibited all the hallmarks of a “rogue” regime: with its leader

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<sup>113</sup> Scott D. Sagan and Kenneth Waltz, *The Spread of Nuclear Weapons: An Enduring Debate*, New York: W.W. Norton & Company, 2012.

<sup>114</sup> Moeed Yusuf, "Predicting Proliferation: The History of the Future of Nuclear Weapons," *Brookings Institution Foreign Policy Paper Series*, No. 11 (January 2009), p. 25, as cited in Gavin.

committing human rights atrocities, supporting proxy wars in Korea and Vietnam, directly attacking India and threatening war over the status of Taiwan. However, nuclear weapons did not make China more immature and hostile, in fact, presently, “China has one of the most restrained and most responsible nuclear force postures and deployment policies of any nuclear power; it maintains a minimal deterrent under tight command and control while eschewing a first-use doctrine.”<sup>115</sup> The pursuit of nuclear weapons in the post Cold War era is tied to countries that are located in unstable regions or have acquired statehood in ways that make them feel particularly vulnerable to claims against their legitimacy, as the acquisition of nuclear weapons gives them a strong deterrent in defence against any potential attack from hostile elements. For example, India and Pakistan were both born from a violent civil war and bitter partition; China was unrecognized as legitimate until 1979 by the West; South Africa was mired in apartheid; Israel was seeking to establish itself whilst surrounded by hostile Arab states; and of course, there was the issue of an artificially divided Korea.<sup>116</sup>

A similar parallel can be drawn between China and Iran in their pursuit of nuclear weapons. Iran is labelled as “theologically motivated and believe[ing] that Israel should be wiped off the map. It is the chief global sponsor of terrorism through groups such as Hezbollah and Hamas. Middle East experts believe a nuclear-armed Iran would soon be followed by Egypt, Saudi Arabia, and Turkey, and perhaps others as well.”<sup>117</sup> Given the hostility that Iran must feel as a result of being singled out by the US, it is “not surprising” that they have an interest in nuclear weapons.<sup>118</sup> An interesting comparison between Iran and China of the 1960s finds that

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<sup>115</sup> Jeffrey Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age*, Cambridge: MIT Press, 2007, p. 1-25, as cited in Gavin.

<sup>116</sup> Gavin.

<sup>117</sup> Greg Sheridan, "Nuclear-Armed Iran Changes World," *Australian*, 3 July 2008, Date of Access: 21 October 2013, <http://www.theaustralian.news.com.au.proxy.bib.uottawa.ca/story/0,25197,23959567-7583,00.html>, as cited in Gavin.

<sup>118</sup> Gavin.

the US does not rate Iran as threatening as it did China in that time, noting that Iran is, “not overtly confrontational or given to wild swings in behaviour or to delusional goals; it has not denounced arms control treaties to which it formally adheres; and there is evidence of pluralism and some debate within the country.”<sup>119</sup> As such, if Iran were to acquire nuclear weapons they could potentially follow the same path that China did and be more responsible and less aggressive, “finding that possession of a nuclear weapon actually diminishes its options in the Middle East and forcing it to act with greater restraint.”<sup>120</sup> The same could be said for North Korea, or it could turn out to be the exact opposite.

Proceeding with the assumption that nuclear weapons states can be successfully deterred from using their weapons in a direct attack against another state, the only remaining threat to engage with is the threat posed by possible state-sponsored nuclear terrorism. According to the rhetoric, nuclear weapons states or rogue regimes would be inclined to provide nuclear weapons or materials to terrorist organizations so as to allow for a proxy through whom they can attack their adversaries.

However, state sponsor of nuclear terrorism is dependent on one question: What is the likelihood that a country could sponsor a nuclear terror attack and remain anonymous?<sup>121</sup> If a state wished to claim responsibility for a nuclear attack or another State, they would not have to resort to sponsoring terrorists to do so on their behalf.<sup>122</sup> As such, anonymity remains the key consideration for discussion on the likelihood of state-sponsored nuclear terrorism. A fundamental contradiction is thus exposed when a country seeks to sponsor nuclear terror, as

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<sup>119</sup> Shahram Chubin, *Iran's Nuclear Ambitions*, Washington, D.C.: Carnegie Endowment for International Peace, 2006, p. 44, as cited in Gavin.

<sup>120</sup> Frank Procida, "Overblown: Why an Iranian Nuclear Bomb Is Not the End of the World," *Foreign Affairs Snapshots*, 9 June 2009, Date of Access: 21 October 2013, <http://www.foreignaffairs.com/articles/65127/frank-procida/overblown>, as cited in Gavin.

<sup>121</sup> Keir A. Lieber and Daryl G. Press, “Why States Won’t Give Nuclear Weapons to Terrorists,” *International Security*, Vol. 38, No. 1 (Summer 2013), p. 80-104, p. 83.

<sup>122</sup> *Ibid.*, p. 85.

“given the incredible risks, it must collaborate with a group that it trusts completely. At the same time it must choose a terror partner with who it has weak (untraceable) ties.”<sup>123</sup>

Keir A. Lieber and Daryl G. Press undertake an exhaustive study into the attribution rates of conventional terrorist incidents in order to determine an answer to the key question above by examining terrorist incidents through the following criteria:

- How many suspects would there be in the wake of a nuclear detonation?
- How many foreign terrorist organizations (FTOs) have state sponsors?
- Of those that do, how many state sponsors do they typically have?
- How many state sponsors of terrorism have nuclear weapons or sufficient stockpiles of nuclear materials?<sup>124</sup>

The authors conclude that neither a terrorist group nor a state sponsor would remain anonymous after a nuclear terror attack based on their findings that there is a strong positive relationship between the number of fatalities caused in a terror attack and the likelihood of attribution (75%). Furthermore, the rate of attribution goes up drastically for attacks on the US or its allies (97%), and finally, that tracing culpability from a guilty terrorist group back to its state sponsor would not be particularly difficult as there is currently only one country that sponsors terrorism which also has nuclear weapons and/or sufficient fissile materials to manufacture a weapon: Pakistan. Please refer to Figure 2, for a table showing a shortlist of terrorist organizations and their state sponsors.

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<sup>123</sup> Lieber, p. 95.

<sup>124</sup> Ibid., p. 83.

Figure 4: A shortlist of terrorist organizations and their state sponsors<sup>125</sup>

State-Sponsored Foreign Terrorist Organizations (FTOs)					
	Syria	Iran	Pakistan	Venezuela	Cuba
Popular Front for the Liberation of Palestine	x				
Hamas	x	x			
Hezbollah	x	x			
Al-Qaeda		x			
Haqqani Network			x		
FARC				x	x

The authors observed that nearly all of the terror groups listed have only one or two sponsors; allowing them to draw one conclusion: that if a terrorist group is identified as responsible for a nuclear attack, the list of possible sponsors will be short, and in almost every conceivable case, a single nuclear-armed suspect state will stand out.<sup>126</sup> A counter argument to their analysis is that the attribution rates of a nuclear terror attack cannot be extrapolated from data on conventional terrorist attacks. However, in the wake of an unprecedented nuclear terrorist attack, there would be a vast amount of resources dedicated to investigating the attack, with close intelligence cooperation from allies, and countries with stockpiles of nuclear materials eager to demonstrate innocence.<sup>127</sup> The planning and execution of a nuclear terrorist attack is not a process that can easily be compartmentalized and kept covert, there will be the figurative “paper trail,” and it will be discovered and traced.

<sup>125</sup> Lieber.

<sup>126</sup> Ibid., p. 95.

<sup>127</sup> Ibid., p. 99-102.

Another counter argument that could be presented builds upon the ideas of “loose nukes,” first explored by John Mueller in “Think Again: Nuclear Weapons.”<sup>128</sup> The State sponsoring nuclear terrorism could provide the weapon/materials to the terrorists then play innocent by blaming that the lack of adequate security infrastructure allowed terrorists to acquire these nuclear materials independently. Given such a declaration, the state would be able to carry out a nuclear attack on another state under the cover of a nuclear terrorist attack. However, such a counter argument would not stand as first, no state would seek to place itself squarely in the spotlight by admitting culpability in the immediate of a nuclear attack, and; second, the existence of close ties between the terrorist organization and the sponsoring state would easily dispel any attempts by the state to perpetuate a falsehood about “loose nukes.” Attempting to place the blame on another country would also not work as most countries have small stockpiles of fissile materials that are inventoried and could easily be checked for integrity.<sup>129</sup>

Thus, the findings of Lieber and Press have two important implications. First, the threat of state-sponsored terrorism is greatly over exaggerated. As the logical rationale behind the principle of deterrence holds true for nuclear attacks, so too does it stand for any state who is considering sponsoring nuclear terrorism. The great risk of being discovered as responsible and the fear of any resulting punishment will serve as a sufficient deterrent for any state, given that states are entities who are more rational and concerned with survival. Secondly, analysts and policymakers should stop understating the ability of the US to attribute terrorist attacks to their sponsoring States. When it comes to the issue of counter-nuclear terrorism and the gravity of the situation, a strong a deterrent should always be presented.<sup>130</sup>

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<sup>128</sup> John Mueller, “Think Again: Nuclear Weapons,” *Foreign Policy*, No. 177 (January/February 2010), p. 38-44.

<sup>129</sup> Lieber, p. 96-98.

<sup>130</sup> *Ibid.*, p. 84.

## Discussion: Moving beyond Mueller

By demonstrating that the arguments for nuclear alarmism are unfounded, this MRP has disproved the critics of Mueller's conclusion that the rhetoric on nuclear terrorism is "overblown." However, there are two other axes from which criticisms on Mueller's work can be levied.

First, some argue that Mueller too easily dismisses the threat from terrorist organizations, especially in the consideration of worst-case scenarios. Mueller argues that if we are to worry about worst case scenarios, we should focus on the "big one: the remote, but nonzero, possibility that the earth could be struck any day now by a large meteor or comet,"<sup>131</sup> and not on issues with small threat probabilities such as nuclear terrorism. Here, Mueller engages in a bit of overblown rhetoric himself which does not necessarily answer the criticisms. Further criticism from this axis stem from the fact that, for example, organizations such as Al-Qaeda<sup>132</sup> have continued to conduct attacks that have had "strategic" effects and furthermore, have contributed to the additional deaths of hundreds of thousands of people by creating and sustaining insurgencies around the world.<sup>133</sup> As such, by overlooking this issue, Mueller's analysis of the threat of nuclear terrorism remains flawed.

In response to this however, it should be observed that terrorist organizations such as Al-Qaeda have been strongly limited by the initial US overreaction (Afghanistan/Iraq) and as such with an increased global awareness of the issue, in conjunction with efforts to combat WMD and nuclear terrorism proliferation, the ability of terrorists to conduct any aspect of their nuclear terrorism programme, or on the whole, in general, have been severely hampered.

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<sup>131</sup> John Mueller, "Response," *Terrorism and Political Violence*, No. 17 (2005): 523-528, p. 525.

<sup>132</sup> As an example, the attack on the gas facility near In Amenas, Algeria, conducted by AQIM.

<sup>133</sup> Daniel Byman, "A Corrective That Goes Too Far?" *Terrorism and Political Violence*, No. 17 (2005): 511-516, p. 511.

A second avenue by which criticisms can be levelled at Mueller is in his dismissal of spending on counter-nuclear terrorism initiatives. For Mueller, we have an “obligation to make some assessment about how much more concern remote contingencies (or fantasies) are worth since there are always opportunity costs”<sup>134</sup> and as such, although Mueller’s deconstruction of the overblown is “welcome,”<sup>135</sup> there is a pressing need for a “comparative risk assessment... develop[ing] a cost-benefit analysis of counterterrorist policy that balances likely achievements in reducing terrorism against both direct and indirect costs [with] such evaluations of effectiveness are long overdue.”<sup>136</sup> Mueller is criticized for not having actual facts and figures to back up his argument that the costs of preventative counter-nuclear terrorism efforts far outweigh any benefits derived. In 2011, Mueller, along with Mark G. Stewart, attempt to address this avenue of criticism with their book *Terror, Security and Money: Balancing the Risks, Benefits, and Costs of Homeland Security*.

### Why not spend?

In this book, Mueller and Stewart attempt to frame the question of spending not based on the question of “are we safer?” but instead “are the gains in security worth the funds expended?”<sup>137</sup> Through a “cold, heartless calculus” in his rationalization of the costs of fighting against WMD terrorism versus actual costs of terrorist attacks,<sup>138</sup> Mueller demonstrates that the expenditure levels spent on US domestic homeland security in the decade since 9/11, require the foiling of approximately 1,667 major attacks per year in order for the costs to equal the

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<sup>134</sup> Mueller, “Response,” p. 525.

<sup>135</sup> Martha Crenshaw, “A Welcome Antidote,” *Terrorism and Political Violence*, No. 17 (2005): 517-521, p. 517.

<sup>136</sup> *Ibid.*, p. 520.

<sup>137</sup> John Mueller and Mark G. Stewart, *Terror, Security and Money: Balancing the Risks, Benefits, and Costs of Homeland Security*, as prepared for panel presentation, “Terror and the Economy: Which Institutions Help Mitigate the Damage?” at the Annual Convention of the Midwest Political Science Association, Chicago, IL, 1 April 2011, p. 1.

<sup>138</sup> Richard K. Betts, “Maybe I’ll Stop Driving,” *Terrorism and Political Violence*, No. 17 (2005): 507-510, p. 507.

benefits.<sup>139</sup> In conducting this analysis, Mueller uses data on federal expenditures on domestic homeland security, focusing particularly on those from the Department of Homeland Security (DHS).

Mueller identifies that government policy is being influenced by the “terrorism industry” – a group which encompasses various risk entrepreneurs and bureaucrats – which pushes for the government to spend money in non cost-efficient ways.<sup>140</sup> Building upon this same line of reasoning, Benjamin Friedman argues that “one way to disarm terrorists is to convince regular Americans to stop worry about them,”<sup>141</sup> and that “for questionable gains in preparedness, we spread paranoia.”<sup>142</sup>

As such, Mueller argues that instead of these costly options, alternatives should be sought in which money would be spent in the most cost-efficient forms of reducing public fears about terrorism, whereby although “policing terrorism is certainly worthwhile, it seems to me that it is even more important to keep ourselves from engaging in self-destructive – and terrorism-enhancing – overreaction.”<sup>143</sup> Mueller argues that independent of individual country spending, the campaign against terror will continue to “generally go[ing] rather well” as there is an overriding compelling incentive for states to cooperate in dealing with this common problem.”<sup>144</sup>

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<sup>139</sup> Mueller, *Terror, Security and Money: Balancing the Risks, Benefits, and Costs of Homeland Security*, p. 1.

<sup>140</sup> Mueller, “Six Rather Unusual Propositions About Terrorism,” *Terrorism and Political Violence*, No. 17 (2005): 487-505, p. 493.

<sup>141</sup> Benjamin Friedman, “Leap Before You Look: The Failure of Homeland Security,” *Breakthroughs*, Vol. 13, No. 1: (2004), p. 32.

<sup>142</sup> *Ibid.*, p. 35.

<sup>143</sup> Mueller, “Response.”

<sup>144</sup> Mueller, “Six Rather Unusual Propositions About Terrorism,” p. 487.

Figure 5: Mueller/Stewart Cost-Benefit Analysis of DHS spending: the bottom array provides break-even points for various loss levels<sup>145</sup>

Table 2. Net benefit in billions of dollars for US enhanced homeland security expenditures of \$75 billion per year assuming these have reduced risks by 45 percent

Annual probability of a successful attack in the absence of enhanced security expenditures	Losses from a successful terrorist attack						
	\$100 million Times-Square	\$1 billion	\$5 billion London bombing	\$100 billion	\$200 billion 9/11	\$1 trillion Nuclear port	\$5 trillion Nuclear Times Square
0.1 percent	-75	-75	-75	-75	-75	-75	-73
1 percent	-75	-75	-75	-75	-74	-71	-53
5 percent	-75	-75	-75	-73	-71	-53	38
10 percent	-75	-75	-75	-71	-66	-30	150
25 percent	-75	-75	-74	-64	-53	38	488
50 percent	-75	-75	-74	-53	-30	150	1050
100 percent <sup>1</sup>	-75	-75	-73	-26	15	375	2175

Note: Each entry above represents the benefit-minus-cost result for each loss and for each attack probability. Entries that are positive would be considered to be cost-effective. A value of -75 denotes no benefit.

#### Break-Even Analysis

The number of otherwise successful attacks averted by enhanced security expenditures required for the expenditures to be cost-effective at several levels of loss—that is, for the security benefit of the expenditures to equal their costs

1667 per year	167 per year	33 per year	2 per year	1 per year	1 every 6 years	1 every 30 years
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## Why Spend?

This MRP agrees with Mueller on the point that the rhetoric on nuclear terrorism is “overblown.” However, Mueller goes beyond simply advocating for the avoidance of overblown rhetoric and goes further to argue that efforts should not be financed beyond the bare minimum. Instead, Mueller remains unconvinced about the necessity and utility of multilateral initiatives and argues that “policies designed to deal with terrorism should focus more on reducing fear and

<sup>145</sup> Mueller, *Terror, Security and Money: Balancing the Risks, Benefits, and Costs of Homeland Security*, p. 28.

anxiety as inexpensively as possible than on objectively reducing the rather limited dangers terrorism is likely actually to pose.”<sup>146</sup> This MRP strongly disagrees with Mueller on the utility of spending money on WMD-terrorism reduction capacities.

In framing the argument against Mueller, it must be noted that “low-probability threats with extreme consequences warrant more concern than high-probability threats with minor consequences,”<sup>147</sup> and that in some cases “reacting may be necessary to prevent over-reacting.”<sup>148</sup> Mueller’s analysis of US government spending takes into account the reality that “federal expenditures on domestic homeland security have increased by some \$360 billion USD since 2001...federal national intelligence expenditures aimed at defeating terrorists at home and abroad have gone up by \$110 billion USD, while state, local, and private sector expenditures have increased by a hundred billion more.”<sup>149</sup> Mueller further builds his criticism of multilateral spending by focusing on the US, and global overreaction to the fear and consequence stemming from the 9/11 attacks.<sup>150</sup> The Iraq war was an expensive mistake, exaggerated and overblown DHS spending to beef up homeland security and its related programmes (alert levels, torture, mass prisoner detainment, etc.) was also exaggerated and overblown, this MRP does not dispute that fact.

However, as Byman points out, “spending money on preventive measures now may often be less costly than the price tag of the response to an attack.”<sup>151</sup> This expenditure, as long as it is the result of carefully rationalized mitigated responses, realized through the implementation of constructive and targeted threat-reduction efforts and initiatives, is warranted. In his analysis of

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<sup>146</sup> Mueller, “Six Rather Unusual Propositions About Terrorism,” p. 487.

<sup>147</sup> Betts, p. 509.

<sup>148</sup> Byman, p. 512.

<sup>149</sup> Mueller, *Terror, Security and Money: Balancing the Risks, Benefits, and Costs of Homeland Security*, p. 2.

<sup>150</sup> Mueller, “Six Rather Unusual Propositions About Terrorism,” p. 491.

<sup>151</sup> Byman, p. 511.

the issue, Graham Allison notes that a total war on nuclear terrorism would cost between \$5-10 billion USD per year, which in perspective, would have been “a penny for every dollar” of Bush’s wartime budget.<sup>152</sup> The spending over the first 10 years of the Global Partnership has yet to reach \$1 billion USD but has achieved concrete results in threat reduction, while multilateral processes such as the Nuclear Security Summit have resulted in further concrete actions taken to ensure global nuclear security and safety. Spending works, as long as it is not on unilateral domestic initiatives resulting from overblown fears. Bringing the argument full circle then, this is why it is important to avoid overblown rhetoric, because constructive targeted threat-reduction efforts and initiatives would not be possible in the face of overblown and sensationalized rhetoric which would confound the issue and lead to further overblown responses such as the Iraq war or DHS programmes post-9/11.

## Conclusion

Thus, as this MRP has demonstrated, the rhetoric on nuclear terrorism has been overblown. By effectively evaluating the arguments for alarmism and responding to them in turn, this MRP asserts that the assumptions from which stem the contemporary overblown rhetoric on nuclear terrorism are not grounded. Fears about terrorists operating independently to acquire nuclear materials, fears about the safety of nuclear installations and radiological sources as well as fears about state-sponsored nuclear terrorism have been assuaged through a reasoned deconstruction of arguments. In addition, this MRP has built upon existing work on the subject of nuclear alarmism to argue that global nuclear security multilateral initiatives have an important role to play in global counter-nuclear terrorism efforts.

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<sup>152</sup> Allison, *Nuclear Terrorism*, p. 177.

John Mueller started off this discussion with his initial thesis that nuclear rhetoric was overblown. This essay has helped to build upon his groundbreaking work as well as to address some of the concerns voiced by critiques of Mueller's work in order to paint an accurate picture of a safe world in which nuclear terrorism is a distant threat, and not an omnipresent, just-around-the-corner event which everyone should be fearful of.

As Michael Levi writes, most terrorist groups "assess nuclear terrorism through the lens of their political goals and may judge that it does not advance their interests."<sup>153</sup> As can be demonstrated through the analysis conducted within this MRP, it shows that the risks, present deterrent and counter measure capacities present in the world, etc. all add up to provide a substantial deterrent to terrorists to attempt nuclear terrorism. In addition, "terrorists in general probably share the same ignorance and fear of WMD prevalent in the broader population, and probably see little reason to turn to unknown, possibly unpredictable and certainly dangerous substances and techniques when the older tactics have proved themselves to be simple, reliable and cheap."<sup>154</sup>

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<sup>153</sup> Levi.

<sup>154</sup> Frost, p. 72-73.

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