IS THE UNITED STATES PREPARED FOR THE THREAT OF NUCLEAR TERRORISM? AN ANALYSIS OF CURRENT SAFEGUARDS AND POLICIES

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By

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ABSTRACT

The threat of nuclear terrorism has been around since the beginning of the nuclear age. Scholars and policymakers have debated over the probability that terrorists could construct a nuclear device and detonate it in a major urban city. That possibility has many worried that nuclear proliferation in unstable countries will increase the likelihood of nuclear material getting into the wrong hands. Therefore, many departments and agencies within the U.S. government have been created to confront the nuclear threat. Agencies like the National Nuclear Security Administration, the Domestic Nuclear Detection Office and the National Counterterrorism Center are tasked with the accountability of the nations’ nuclear arsenal in addition to defending against non-state actors smuggling radiological material into the country.

The problem for policymakers is defensive measures aimed at nuclear terrorism are only one half of the equation. U.S. policies also play a role in nonproliferation efforts around the world. The message that we send regarding our commitment to preventing the spread of nuclear weapons is just as important as our ability to counter an attack. In order to be prepared for the threat of nuclear terrorism the policies adopted by the United States should complement programs and technologies designed to thwart terrorists seeking to cause mass destruction.
The purpose of my thesis will be to compare the United States domestic security architecture with its policies to make a determination about America’s level of preparedness. My methodology includes an analysis of nuclear terrorism, starting with a discussion on the various stages and difficulties that would confront a terrorist seeking to build a nuclear weapon. Also presented is a section on the psychology of nuclear terrorism that incorporates the internal dynamics of terrorist organizations to investigate what motivates a group to seek nuclear arms. Next is an examination of U.S. departments and agencies responsible for intercepting potential terrorists at each stage of building a bomb. And finally, U.S. policy is compared to those efforts to find out if U.S. diplomacy reflects America’s commitment to nonproliferation, or if it actually encourages the problem.

After a thorough assessment of U.S. measures to prevent nuclear terrorism my research has led me to the conclusion that a dichotomy exists between the policy and practices of the United States government. On the one hand we have dramatically increased our security infrastructure since 9/11, which has given policymakers the illusion that we are capable of stopping nuclear terrorism. In contrast, the guiding principle in American nuclear strategy has been to enforce a nonproliferation regime that discriminates between nuclear and non-nuclear states. Additionally, the U.S. government has not been consistent in its enforcement of counter-proliferation goals. Some nations have been given preferential treatment, while others are threatened and punished for their behavior. The result has been states that do not take U.S. nonproliferation efforts seriously, undermining attempts to stop the global spread of nuclear weapons.
INTRODUCTION

Lead scientist of the Manhattan Project Dr. Robert Oppenheimer was once asked during a Senate hearing in 1946 what instrument could be used to intercept and prevent nuclear weapons from being detonated inside of a major city. He remarked that a screwdriver would be needed to open every crate or suitcase for inspection.¹ This statement reflects the nature of nuclear terrorism and the inherent difficulty of developing preventative measures. Since Oppenheimer made that statement the threat has increased tremendously through the proliferation of nuclear weapons beyond the nations that first developed the technology. Policymakers are still presented with that same conundrum even though advances in detection equipment have improved. Oppenheimer’s testimony suggests there is little that can be done to prevent nuclear terrorism from happening as long as nuclear weapons exist. That has not stopped government officials in Washington from developing technologies aimed at detecting illegally obtained material. This equipment is the backbone of the United States nuclear security infrastructure and is important to a comprehensive strategy for combating nuclear terrorism.

After an introductory investigation into the nature of nuclear terrorism, this paper will examine the principal departments and agencies in the United States responsible for the safeguarding of its nuclear arsenal. The most complicated part for anyone planning to construct a nuclear bomb will be the acquisition of fissile material. There are many ways

that a terrorist can go about getting the material, one of which is obtaining it inside of
U.S. borders at many facilities holding radioactive products. The National Nuclear
Security Administration was created to handle the accountability and security of
radioactive material within the country. The agency also has an international component
that is responsible for helping other countries secure their material. The purpose of this
section will be to argue that fissile security is a key aspect in preventing nuclear
terrorism. Furthermore, accountability is contingent on being responsible for nuclear
declarations through verification by an international agency, such as the International
Atomic Energy Agency. This includes the United States adhering to its obligations under
the Non-Proliferation Treaty to work towards complete nuclear disarmament.

The next section will be a discussion of ways to preventively detect and track
radiological material across borders. If terrorists were successful in obtaining
radiological material, the second line of defense would be the ability to intercept any
material from crossing into the country through our land, air, and sea borders. Detecting
nuclear material is a complex and expensive endeavor. Terrorists can easily shield the
signature of most radiological substances using lead and hide the substance among
thousands of containers entering the country daily. Consequently, the prospect of
intercepting hidden material is quite problematic. The equipment that is used, such as
portal monitors, will be scrutinize to point out any flaws the machines might have. That
way the reader will get a better understanding of the types of detection technologies
available and how well it works in real world scenarios. Before I discuss U.S. policies
there is one more characteristic that should be discussed regarding nuclear security.
Intelligence is an equally important means of preventing nuclear terrorism. It provides two functions in helping to reduce the threat by actively disrupting terrorist networks and safe havens. And it also can double as the third line of defense by utilizing groups like the Nuclear Emergency Support Teams, who detect and capture nuclear material that has been stolen. These efforts must be supported by accurate and timely intelligence regarding terrorist networks and instances of nuclear theft. Without that information, it is very hard for a nuclear terrorist to be captured. That is why the accountability of radiological sources is so important. If there is not a precise count of the world’s fissile material, then it frustrates intelligence gathering by making it harder to identify missing nuclear material.

The National Counterterrorism Center is the primary agency responsible for processing and coordinating the intelligence that various agencies receive. The amount of information received and the manner in which it is disseminated plays a huge role in whether the information can be used to intercept potential nuclear terrorists. Therefore, the size and scope of the intelligence community will be assessed to determine if it is capable of preventing the threat. Without a functioning intelligence asset it will be next to impossible to prevent a terrorist who is resolute about his objectives, regardless of any safeguards that are put in place. Accordingly, it is necessary to discuss the way our intelligence community functions so that we get a clearer picture of ways to reform the system and improve the exchange of knowledge between government agencies. Although each stage presented is significant on its own, the ability to prevent nuclear
terrorism does not exist inside of a vacuum. Policy choices are another factor that contributes to overall security and our ability to avert a nuclear catastrophe.

The implications of U.S. policy on global security are profound. More importantly are defensive measures that America can use to stem nuclear proliferation with relatively little financial costs. This amounts to a change in the way the United States conducts diplomacy abroad. The objective of this section will be to show how U.S. policies have encouraged nuclear proliferation by highlighting the discrepancies in our nuclear strategies with other countries. I will begin with case studies of North Korea, Iran, and Pakistan that will demonstrate the inconsistencies in our policies relating to each country. Although every nation is unique and some policies need to be tailored to their particular circumstances, U.S. nonproliferation strategy has allowed special treatment with some countries nuclear programs. The result of this division has allowed many nations to circumvent protocols and start clandestine nuclear weapons. This is very detrimental for international security because unknown nuclear sources are often the ones most vulnerable to diversion and theft.

What should be the solution for combating the spread of nuclear material across the globe? The United States has long held to the belief that the Nuclear Nonproliferation Treaty is the primary mechanism for achieving that security. Instead, I argue the United States should uphold its commitment under the NPT to completely disarm its nuclear arsenal. As long as it remains a superior nuclear superpower it projects the image that they are a legitimate means of military power. Doing so would help persuade other
countries to comply with the standards of protocols. If the current system is held in place, countries that feel they need the protection of nuclear weapons will chose to ignore the U.S. and create weapons programs of their own. The goal of nuclear security can be partially accomplished by being consistent with the policies we choose to address proliferation. The case studies will be used to show that each has various statuses under the NPT. This shows the discrimination in policy relating to each of them. Another factor that discourages cooperation is the way that U.S. diplomacy handles other countries. Often there are sets of demands made in advance of negotiations that must be met. These provisions are usually not accepted by the opposing party, which results in a stalemate and no substantive dialogue. In regards to nuclear terrorism, the diplomatic community needs to realize that this approach is unacceptable. Knowledge is one of the best hedges against proliferation. Exchanging ideas should be one of the focal points on any nuclear policy agenda.

The hypothesis of my paper will be to show that technology used to prevent nuclear terrorism should be supported by sound U.S. policies. Without a coherent plan to combat the threat, groups are more likely to organize and perpetrate terrorism. Furthermore, our policies should back-up the commitments made by the United States in reducing its own nuclear arsenal. Only then will other countries see that we are willing to work cooperatively with other nations and are serious about eliminating the threat. With that said, it is now essential to discuss the different stages of building a nuclear weapon from a terrorist organizations perspective so that we get a better understanding of what would actually motivate or dissuade a group from seeking this route.
CHAPTER 1

ACQUIRING THE BOMB: A TERRORIST’S PERSPECTIVE

The idea of nuclear weapons falling into the hands of terrorists, or any non-state actors, has haunted policymakers since their inception. Over the years the amount of fissile material available worldwide and the number of potential sources from which terrorists could acquire it has skyrocketed.\(^1\) Government officials in Washington must assume that radical terrorists or groups would employ a nuclear device if given the opportunity. Since it is much more likely that a group could acquire the knowledge and materials necessary for a bomb, we must ask ourselves how this would become possible.

Graham Allison, a leading scholar on the topic of nuclear terrorism has developed five key points that are instrumental in assessing the anatomy of terrorist capabilities. He asks who could be planning a nuclear attack, what types of weapons could they use, and where could they obtain the material? If they were successful with the first three, Allison then explains when terrorists could launch an attack and what their delivery options for such an event are. Therefore, in order to properly understand the capabilities and limitations of terrorist organizations we must analyze the issue from their perspective.

I think that Allison’s roadmap is appropriate for this study on nuclear terrorism. However, I would like to include the obstacles that must be surmounted in order for terrorist organizations to succeed with their plans. My goal is to present a comprehensive

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investigation into the nature of nuclear terrorism from the viewpoint of those that would have to carry it out. Due to the proliferation of the supply of fissile material worldwide, it is more likely that terrorist groups could acquire the necessary materials and components required for a bomb. Although this is true, there are serious practical hurdles that would have to be overcome in order for anyone to actually assemble and deploy a working device. For example, the assembly of a nuclear device would take someone with knowledge of the process to put a bomb together. There is also the possibility that a working device could be purchased. If successful, smuggling the device past the security apparatuses of various countries would be difficult, although not impossible. Therefore, terrorists groups have a lot more to consider than just the acquisition of the fissile material. My objective is to scrutinize the entire process in order to assess the danger stemming from terrorist groups possessing nuclear weapons. Obviously the danger would be quite great if those organizations somehow were able to put all the pieces of the puzzle together. My task will be to determine how probable that outcome is based on the anatomy of an attack, as proposed by Allison and an investigation of any obstacles that terrorist groups would have.

As mentioned earlier, another part of the process in determining the danger posed by nuclear terrorism is the scope of nuclear programs around the world. The United States and the countries of the former Soviet Union have thousands of bombs stockpiled. Arms control treaties have been marginally successful in reducing the overall number of weapons that those countries possess. However, the real problem exists once they are being dismantled. The security of the weapons grade material must be completely
guarded, which has not been the case in many instances. Another concern is the black market trade of technology and materials used to expand the nuclear programs of some countries. The countries seeking this route towards a nuclear program are not always concerned with security, which further complicates the threat of proliferation. All of these factors must be taken into consideration in order to assess the threat of nuclear terrorism and to come up with solutions that would make it very difficult for those with nuclear aspirations from accomplishing their goals.

What Organizations Could be Planning a Nuclear Attack?

The international dialogue concerning nuclear threats has typically fallen into two contending schools of thought. The first group says that an attack involving nuclear or other weapons of mass destruction is inevitable. The rest believe that terrorist motivations and technical difficulty are big enough obstacles that any coordinated effort would prove too problematic. These views are at opposite ends of the spectrum relating to the threat of nuclear terrorism. Unfortunately the world is not so clear cut, especially when we are talking about terrorists. What needs to be considered is what organizations have the capacity to possibly obtain and organize an attack using nuclear material.

Only one comes to mind that has the organizational strength, technical knowledge, financial backing, and large network capable of making it happen. Al Qaeda would be the terrorist group that warrants the most attention in this matter. They have

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3. Ibid.
proven their capacity to plan, coordinate and implement attacks that most others simply lack. This statement must be qualified by acknowledging that any individual or group could get a hold of and make a nuclear device. In fact, it may be the ones we do not suspect that end up operating under the radar long enough that they are able to assemble a nuclear device. With that said, the threat of nuclear terrorism is much different than planning and executing attacks of the conventional sort. Not all terrorist groups have the immense resources and network to pull off such a feat. Despite the war on terrorism, Al Qaeda remains a threat that we should not underestimate.

Most alarming are the reports that Osama bin Laden had been planning an attack on nuclear facilities prior to September 11, 2001. After his capture, top Al Qaeda Lieutenant Khalid Sheikh Mohammed was interviewed by the CIA only to discover that originally the 9/11 attacks were aimed at striking nuclear power plants. During that conversation, Mohammed told his interviewers that Al Qaeda leadership had decided to leave out nuclear targets “for now”. This can be corroborated by a series of meetings that bin Laden had with Pakistani nuclear weapons officials in August 2001. He met with Sultan Bashiruddin Mahmood and Abdul Majeed for their technical knowledge and expertise in nuclear physics. Of the two, Mahmood would be considered the most dangerous for his radical view that nuclear capabilities were “the property of the whole


5. Ibid., 19.

6. Ibid.
Muslim community.” His extreme views and access to numerous countries nuclear programs allowed him to spread his knowledge to state and non-state actors alike. Mahmood and other Pakistani officials were subsequently monitored making trips to other countries like North Korea and Libya, even though the Pakistani government maintains that they keep tight controls over the whereabouts of their scientists.

Another shocking discovery was made while searching the home of Abu Khabab, a senior Al Qaeda member in Kabul. In his home he had an essay titled “Superbomb” that thoroughly described the processes for all stages of building a nuclear device. The result of the meetings between Al Qaeda and Pakistani scientists as well as the documents found in Abu Khabab’s house reveals that they are actively inquiring about nuclear capabilities. Regrettably, it tells us little about how far along they might be in the process. It has been a decade since those meetings took place. Some might argue that the war on terrorism has disrupted Al Qaeda’s network enough that they could not be far along in the pursuit of nuclear weapons. Maybe, but their organization has proven over the years to be very tenacious and capable of pulling off unthinkable acts of terrorism. Regardless, there is plenty of evidence to indicate that because of their escalation in lethality, a nuclear bomb could be their next logical step.

7. Ibid., 20.
8. Ibid., 22-24.
10. Ibid., 25.
A wealth of information about the structure, capabilities, and plans of the Al Qaeda organization has come to light since 2001. Intelligence agencies have been able to raid the hideouts of many insurgents, which have been very beneficial in determining their intent. The material collected has revealed plans for seeking nuclear weapons, or chemical and biological agents capable of mass destruction.\textsuperscript{11} Much more disturbing is the lethality for terrorist attacks is reaching higher thresholds.\textsuperscript{12} Each attack requires one grander in scale than the last. This trend suggests that if a group were able to acquire and put together any weapon of mass destruction, they might seriously think about using it. There are also reasons why terrorists may not use such a weapon. This will be discussed later in the chapter under motivations and disincentives for acquiring a bomb.

Furthermore, many organizations besides Al Qaeda that have proven to be very violent. Jemaah Islamiyah, Hezbollah, Chechen separatists, and others are equally dangerous groups that could obtain nuclear weapons. We must take all groups seriously.

\textbf{Where Could Terrorists Obtain Radioactive Material?}

The consensus among scholars agrees that the most challenging part of developing a nuclear device is the acquisition of fissile material.\textsuperscript{13} The process for refining and enriching into weapons grade form is too complex and requires more time than terrorists could probably get away with. The only options they have are to steal the

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\textsuperscript{11} Charles D. Ferguson and William C. Potter, \textit{The Four Faces of Nuclear Terrorism} (New York: Routledge, 2005), 16.
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\textsuperscript{12} Ibid., 15.
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\textsuperscript{13} Ibid., 271.
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necessary substance or to find someone willing to sell it to them.\textsuperscript{14} Therefore, the progression for any group seeking to build a nuclear device can be broken down into three basic categories.\textsuperscript{15} First, as mentioned above, is the act of getting a hold of enough radioactive material to make a bomb. Second, is bomb-building and deciding what type of delivery vehicle to choose. And the last component is the transportation of that device to its intended target. Those stages will be analyzed in detail and any obstacles in that development are going to be pointed out.

One possibility is to buy the material or a working device on the black market. This option is conceivable if the terrorist group has the financial clout to buy the material outright.\textsuperscript{16} For example, Pakistan’s Dr. Abdul Qadeer Khan, for many years was able to sell components of uranium enrichment to many countries that were in the process of developing nuclear programs. In fact, his research laboratories even made a booklet that advertised different types of nuclear technology available.\textsuperscript{17} Not only does this provide an opportunity for terrorists to obtain parts, it also increases the number of states with materials and technology that could potentially be stolen or sold again on the black market. Khan’s enterprise not only sold equipment, but also exchanged technical knowledge of nuclear weapons with other countries. Recall the meeting between Osama bin Laden and Mahmood and Majeed? Khan himself was traveling to countries like

\begin{thebibliography}{99}
  \bibitem{15} Ibid., 28.
  \bibitem{16} Ibid.
  \bibitem{17} Allison, \textit{Nuclear Terrorism}, 38.
\end{thebibliography}
North Korea and many of Pakistan’s scientists were doing the same and for many years were running a financially profitable criminal enterprise. Another example was reports that after the break-up of the Soviet Union a number of portable suitcase nukes were unaccounted for. In May 1997, General Alexander Lebed met with a delegation of members of Congress and admitted that the Russian government could not account for eighty-four, one-kiloton suitcase nuclear devices. These were convenient and portable weapons that looked no different than a standard suitcase that could be carried almost anywhere without raising any alarms. More disturbing is the fact that the devices did not require any launch codes and could be detonated by a single person within thirty minutes.

Shortly after that meeting the Kremlin discredited the information given by General Lebed and denied that any such weapons had ever existed, or that anything was missing from their strategic arsenal. More than likely the cover-up by the Russian government was intended to save face from having to actually admit they did not have their house in order. Even though it has been over a decade since the admission by General Lebed, we have to expect that some of those missing devices could have ended up in the hands of organizations that have the intention of using them. My point is that

18. Ibid.
21. Ibid., 44.
22. Ibid., 45.
many countries lack the adequate safeguards required for the protection of their weapons. Add poor security to an increase in countries with nuclear programs and the chances that functional weapons or the material needed to build one could be stolen are heightened. An alternative view would be that existing nuclear devices are critical national assets that are locked in fortified facilities, guarded by highly trained troops.\textsuperscript{23} I agree that stealing or obtaining a working device would be the more difficult route to choose. However, the proliferation of related technology and material around the world has had a negative effect on the security of nuclear weapons programs, making it entirely possible. Countries like Libya, Syria, Iran, North Korea, former countries of the USSR and Pakistan all include programs that have limited security apparatuses or a history of black market dealings. Therefore, if you were a terrorist group you would have a better chance of making a bomb by stealing or buying fissile material, rather than obtaining a working device. First, I must examine the manner in which a terrorist would choose this route and any possible impediments that could be encountered.

The opportunity is out there for any terrorist looking to obtain fissile material. In fact, the global stockpile of highly-enriched uranium is around 1.6 million kilograms, and 500,000 kilograms for plutonium.\textsuperscript{24} Of that amount, only 25 kg and 8 kg of material are required to make a crude device using HEU and separated plutonium, respectively. Thus, there is plenty of material available worldwide that could potentially be at risk.

\textsuperscript{23} Langewiesche, \textit{The Atomic Bazaar}, 19.

from theft. Insecure fissile material is the most probable way that terrorists would obtain the main ingredient for making a nuclear bomb. Traditionally the costs of nuclear technology and relative security of most nuclear sites has been enough of a barrier for all but the most organized and financially capable non-state actors. 25 However, the collapse of the Soviet Union provided potential nuclear terrorists with a significant source of material that is already enriched and ready for a delivery vehicle. 26 The breakup up the Soviet Union left forty thousand nuclear weapons and over one thousand metric tons of nuclear material to be accounted for. 27 Those weapons and materials were distributed among several independent states. And to compound the difficulty in accounting and securing those stockpiles was the belief during the Cold War that the “Iron Curtain” provided a sufficient defense against any theft or leakage. 28 Therefore, Soviet nuclear storage facilities were loosely guarded on the inside. The main concern with insecure materials is the compounding threat from poorly guarded facilities. For instance, nuclear leakage in countries that have poor security increases the chances of terrorist acquisition. 29 Considering the weak security in some countries, the black market, and amounts of worldwide fissile material, the probability is very great that non-state actors could successfully acquire enough nuclear material for at least a crude device.

25. Falkenrath, America’s Achilles’ Heel, 130.
26. Ibid., 131.
28. Ibid.
29. Falkenrath, America’s Achilles’ Heel, 131.
Less probable approaches that terrorists might use to acquire nuclear material are through a deliberate transfer from a national government. This method is possible, but because of advanced techniques in attribution, nations would be deterred from helping a group for fear they would be the ones facing retaliation for an attack. \(^{30}\) On the other hand, states could help terrorists by aiding them financially or by making important connections. \(^{31}\) Covertly helping a terrorist organization is harder to trace and would confuse any attempts for assessing culpability after a nuclear attack. Insider officials or facility managers are another possible source. It is possible for a terrorist group to plant or coerce somebody on the inside with the purpose of smuggling the material out of a facility. \(^{32}\) While this would be challenging, it would not be that difficult for someone on the inside to gain access to low-grade radioactive sources.

Additionally, the collapse of a nuclear state would initially present numerous opportunities for gaining radioactive materials. Very soon, it is likely that the IAEA and others would step in to avert any possible leakage. Lastly, ties to organized crime might be used to steal fissile material. Criminal enterprises, including black market dealings are subject to fraud and can also lead to unpredictable outcomes because of distrust, making these options a last resort. Therefore, terrorists seeking to acquire fissile material have many options at their disposal. Each one has its potential obstacles, although they are not big enough for a determined organization to overcome.

\(^{30}\) Ferguson and Potter, *The Four Faces of Nuclear Terrorism*, 272.


\(^{32}\) Ferguson and Potter, *The Four Faces of Nuclear Terrorism*, 273.
How Terrorists Could Build a Bomb? Types of Devices and Obstacles

After passing the most difficult hurdle of obtaining fissile material the next stage would be to build a device. This step would be influenced by the amount of material they were able to get a hold of and their objectives. Gaining access to highly enriched material would allow for a more powerful device, but it would require more technical expertise. In order to make sure that the highly radioactive material is properly handled and the weapons design is accurate, a team of experts would be required. Secondly, the organizations size and goals are factors in making a bomb. Their access to necessary resources would either enable or limit the type of bomb they could make. Also, their operational objectives may call for the use of a smaller, less powerful device. Consequently, there are many considerations to make when building a nuclear device.

If you only had a small amount of nuclear material, the quickest and least expensive type of bomb to construct is commonly known as a “dirty bomb”. This kind of device is not considered a nuclear bomb and does not involve the chain reaction required for a nuclear explosion. Construction of a dirty bomb is relatively simple. First, you would need a conventional high explosive, like Semtex, dynamite, or TNT. Next you would need a source of radiological material that would be blown into the atmosphere after detonation. A small terrorist group on a budget could easily piece together a dirty bomb with little external help.

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34. Ibid., 38.
Another option is to develop a weapon that uses a nuclear chain reaction. The most widely used radioactive materials are uranium-235 and Plutonium. Similarly, gun-type and implosion devices are standard designs used for reaching super criticality. Gun devices fire one piece of subcritical uranium into the other. Implosion bombs direct explosives around a core to create criticality and start the nuclear chain reaction.\(^{35}\) Terrorist groups would be much more likely to use a gun device because it can be easily constructed and does not require the mathematical modeling needed to make sure the implosion goes off correctly.\(^{36}\) Fabrication would also involve knowing the characteristics of the type of radiological material they chose to make sure it explodes correctly.\(^{37}\) Fortunately for them the scientific data needed to understand this process is available in mainstream scientific publications and journals.\(^{38}\) Furthermore, today’s computers would further simplify the process by making all of those calculations for them.

The basic barrier to building a bomb involves the fissile material itself. The goal of any terrorist group would be to procure the material already molded in a proper shape for use inside of a weapon.\(^{39}\) If the material was already in a perfect sphere, then detonation would be very easy. For example, assuming that terrorists could get two


\(^{36}\) Falkenrath, America’s Achilles’ Heel, 163.

\(^{37}\) Ibid., 128.

\(^{38}\) Ibid.

\(^{39}\) Levi, On Nuclear Terrorism, 40.
hundred pounds of weapons-grade uranium, all it would take to create a blast of 5 to 10 kilotons would be to drop the first 100 pound mass on the other.\textsuperscript{40} If the material was in any other shape, it would have to be sculpted into a sphere in order to make it usable. This would require much more expertise because the potential for error or an accident is far greater. In sum, the simplistic design of a gun-type weapon and the technical expertise to put one together is fully within the capabilities of an organization with the resources to recruit people that understand physics and engineering.\textsuperscript{41} The relative ease in the design and construction of a bomb would make this step only a minor road block for a terrorist group in their pursuit of a nuclear weapon.

To illustrate the simplicity of building a nuclear explosive device, the U.S. Congress has already proven that it is entirely possible to do using legally acquired parts.\textsuperscript{42} In 2004, a gun-type device was brought into a hearing of the Senate Foreign Relations committee. The members were told that all the materials used in its construction were commercially available. This example shows that not only is it doable, anyone assembling such a weapon might not trigger any alarms by law enforcement or government officials. That brings us to the last impediment for a terrorist group to consider, which is how to transport the nuclear bomb to its intended target.

\textsuperscript{40} Ibid., 39.

\textsuperscript{41} Ferguson and Potter, \textit{The Four Faces of Nuclear Terrorism}, 134. During the Manhattan Project scientists were so confident in the gun-type design they believed it was unnecessary to test it with an actual detonation. However, on July 16, 1945 the trinity test validated the design prior to its use on Hiroshima.

\textsuperscript{42} Bunn and Wier, “Terrorist Nuclear Weapons Construction,” 145.
How Would Terrorists Transport and Deliver a Bomb to its Intended Target?

The next phase would be to get the weapon through the detection and law enforcement apparatuses of the intended target country. Continuing with the gun-type design, how difficult would it be to transport this kind of device? The length of the weapon would be around one meter, 25 centimeters in diameter, and weigh about 300 kilograms. Thus, in this case it would be real simple to conceal while delivering the weapon. Shielding the radioactive material would also be needed in order to bypass any kind of detection equipment at ports or other checkpoints where huge amounts of cargo are brought into the country. However, that can be taken care of using lead or other substances that interfere with the radioactive signature of the material. Regardless of the type of weapon chosen, there are many strategies that minimize the risk of being caught. Assembly of the weapon, or procurement of the fissile material, need not be done outside of the U.S. and smuggled in. It could be done inside of our borders using many different radiological sources. If a dirty bomb was the chosen method of deployment, then medical, industrial, and agricultural facilities could become a target because they all contain radioactive elements in some of its equipment. Nuclear power plants and other locations containing radioactive material may also be the target of an attack in order to cause nuclear leakage. If the material was being smuggled into the U.S., preventing that would require inspection for every container coming into the country. Also, every square

43. Barnaby, How to Build a Nuclear Bomb, 111.


mile of our borders would have to be monitored. The United States has over 7,000 miles
of land borders with Canada and Mexico, and over 12,000 miles of coastline.\textsuperscript{46} Even in
busy ports with detection equipment, hiding and shielding a bomb is relatively
straightforward. With so many opportunities, a nuclear attack could conceivably come in
any form. Accordingly, finding a device would be like finding the proverbial needle in a
haystack.

One case in point occurred on August 23, 2003 when a suitcase containing fifteen
pounds of nuclear material was successfully shipped from Jakarta, Indonesia to the port
of Los Angeles inside a cargo container.\textsuperscript{47} ABC News’ Brian Ross set up the shipment in
order to test the United States detection measures. In fact, the majority of international
trade takes place between thousands of shipping ports around the world. Therefore, the
number of containers versus the manpower and inspection equipment does not add up. It
can take a team of five U.S. Customs agents three hours to conduct a thorough inspection
of one cargo container.\textsuperscript{48} Times that figure by the number of containers being shipped
into the U.S. every day and the time and resources needed for totally secure ports is
astronomical. Some figures will help to get an idea of the immense challenge confronting
U.S. Customs. Shipping containers are measured in twenty-foot equivalent units, or
TEUs. Each year worldwide trade results in around 300 million TEUs, of which over 40

\begin{footnotesize}
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\item[46.] Janice Beaver, “U.S. International Borders: Brief Facts,” Federation of American Scientists,
\item[47.] Allison, \textit{Nuclear Terrorism}, 104. Reporter Brian Ross complied with all U.S. and
international laws by using depleted uranium as the substance being shipped.
\item[48.] Ibid., 109.
\end{itemize}
\end{footnotesize}
million are imported into the United States. Only a fraction of those are then singled out for inspection. As I mentioned earlier, even if the container containing the bomb were set aside for inspection it would still have a good chance of passing if the material was properly shielded. Therefore, the opportunity and chances of success are on the terrorists’ side. Trying to interdict every container or package at all possible points of entry is impractical.

The realities facing the United States are very daunting. We are posed with a significant risk from nuclear terrorism if we are unable to properly defend our borders from terrorist groups attempting to smuggle materials past our security. In addition to detection equipment, the U.S. does have Nuclear Emergency Support Teams (NEST). Their job is to find and retrieve stolen nuclear material after it has been reported stolen. Unless the nuclear material is reported stolen or intelligence has found suspicious activity, the team cannot respond. Therein lays the problem. Nuclear material can be smuggled out in small doses or stolen in a country that has inadequate safeguards to realize the substance is missing. In order to truly solve this dilemma, the safety and accountability of all nuclear material must be the focus of U.S. policymakers. The fact of the matter is that without access to radiological sources, the threat emanating from this type of terrorism would be nonexistent. Now that we understand the severity of the threat, what would actually incline a terrorist group to go nuclear?


Psychology of Nuclear Terrorism: Motivations and Disincentives

Terrorism is a form of warfare that intends to strike fear and uncertainty into the society it has targeted. Bruce Hoffman explains, “It is the threat of violence, used and directed in pursuit of, or in service of, a political aim”. Furthermore, terrorism has been around for centuries and has changed significantly in method and meaning. Over time it has evolved, encompassing many different techniques and objectives. In other words, the materials used and the political aims of a terrorist group can transform, depending on the society and period in which they live.

In addition, over the years weapons of greater destructive power have been invented. These new weapons have the possibility of falling into the hands of a determined group. However, just because they are available does not mean that terrorists would resort to using them. For example, another characteristic of terrorism is the thought processes for attacks and their motivations are usually very rational decisions. In order for a terrorist group to decide on nuclear terrorism they would have to make logical choices based on a number of motivations and disincentives for their particular situation. Matthew Bunn gives us a numerical probability of nuclear terrorism occurring within the next decade. His models suggest there is a 29-50 percent chance of nuclear terrorism happening based on various assumptions built into his research. Relying only

52. Ibid.
53. Ibid., xv.
on statistics can have the effect of making research seem overly secure or alarmist. I would like to address what particular circumstances would motivate or discourage a non-state actor from the pursuit of nuclear terrorism. This will help to properly understand and prepare for the threat.

The previous sections discussed the different stages involved in nuclear bomb construction. Prior to that happening a non-state actor must decide that it is within their interests to pursue that path. On a basic level, a terrorist group with extreme objectives must develop and they must decide to engage in nuclear terrorism. Although, many other considerations have to be made before a terrorist group decides to go nuclear. Most importantly would be the organizations ability to recruit people with the necessary skills to guide the group through the process of making a bomb. Another consideration would entail developing a very secretive and organized command structure. Without the ability to effectively manage and compartmentalize, planning a nuclear attack would be next to impossible. This would be compounded by the increased risk of preparation that is inherent in plotting nuclear terrorism. Only those with superior organizational structures would be able to pull off an attack of this magnitude.

Michael Levi calls this progression organizational learning, described as “a process through which members of a group acquire new knowledge that can be applied in strategic decision-making, tactical planning and design, and operational activities. The process of learning is gradual, but pays off immensely when the time comes for an


operation. This development is vital for groups pursuing nuclear terrorism. Their organization must have members at all levels of the capability spectrum. Alternatively, as the groups’ capabilities and size increases, so does the possibility that something may go wrong.\(^{57}\) This is why security and need-to-know compartmentalization for large attacks is important.

Competency is only one aspect of determining the motivations of nuclear terrorism. Capability does not properly evaluate the probability of the threat. There are groups that may possess the ability, but lack the motivation. Conversely, there are those that would like to go nuclear and do not have the resources. A more accurate assessment would establish what type of terrorist organizations would pursue nuclear weapons and also help to identify the agendas that would lead them towards that goal. Assuming that a potential nuclear terrorist is fully able to carry out his plans, what would be his motivations or disincentives for doing so? Groups that have been deemed most likely to pursue nuclear terrorism are apocalyptic groups, those with political and religious aims, nationalist/separatist factions and single-issue terrorists.\(^{58}\) Each one has been singled out for their extreme views on a number of issues. Serious convictions are a pre-requisite for any group wanting to make the leap from conventional to nuclear terrorism.

Politico-religious groups might use a nuclear bomb to influence their adversaries. Political groups are typically more constrained in what they can get away with for fear of alienating those who support them. Religious groups can be more fanatical but most of

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57. Ibid.

the time they have moral reservations about inflicting mass murder. On the other hand, apocalyptic groups might use the bomb to instigate a broader nuclear conflict to fulfill their doomsday prophecies. Nationalist and separatist groups have special considerations because of their proximity to their target.  

59 Because they rely on support from elements within the target country, they cannot afford to lose that support base. Therefore, these terrorist organizations as well as political ones “discriminate in their activities and develop operations with limited objectives, targets, and scale”.  

60 In every group the decision to escalate the violence to the nuclear level has a number of rational causes. Most importantly, intelligence agencies should focus on identifying those that might cross that threshold.

There is some controversy over the probability of terrorists shifting from conventional to nuclear attacks.  

61 Some argue that making that transition is relatively easy, while the other half believes it is a major psychological step. Figuring out why an organization would switch tactics has major implications for the threat of nuclear terrorism as a whole. It is important to be aware of the fact that all groups would have conflicting sets of tactical, strategic, political and theological considerations.  

62 The change from conventional weapons to more destructive ones would not happen overnight. It would be a slow, deliberate process of escalation. Any one of those

59. Ibid., 21-25.

60. Ibid., 25.


62. Ibid., 162.
considerations can change, thus altering the course of the group. External matters can also influence the operations and goals of terrorists. The only way to get a broader picture of their motivations is to observe the evolution of terrorist groups and to be on the lookout for any group that has the capability and intent to use nuclear terrorism.

Unfortunately, determining the motivations of terrorist groups is not an exact science. Monitoring suspected groups will only get us so far in assessing their potential for nuclear terrorism. There is no full proof method that will result in providing us with complete accuracy on the intentions of non-state actors. Terrorist groups, by nature, are not easily classifiable.\(^\text{63}\) They differ in size, structure, ideology, objectives, strategies, tactics, and they do not announce their plans before an attack.\(^\text{64}\) They do operate out of a different playbook that is based on rational, thought out decisions. However, finding exactly what motivates a terrorist is only one part of the problem. When it comes to nuclear weapons, removing their capability is the only sure method. Alternatively, as I suggested some terrorist groups that have the capability may decide not to perpetrate nuclear terrorism.\(^\text{65}\) Disincentives for not using weapons of mass destruction include not wanting to inflict mass murder in order to achieve their objectives because it may be counterproductive. Or conventional means of attack might be more accessible to those interested in mass casualties. Also, the process of getting fissile material, constructing the bomb, and delivering it to its target could be perceived as too risky. Others may have


\(^{64}\) Ibid., 36.

\(^{65}\) Falkenrath, *America’s Achilles’ Heel*, 45.
moral reservations about killing with those types of weapons. Consequently, every terrorist group is unique and follows a different approach based on the nature of their leadership, their attitudes towards risk, and its demands for operational security.\textsuperscript{66}

One last observation about terrorism is the common misperception that society has concerning terrorists as being psychotic, mentally ill individuals.\textsuperscript{67} Or that an entire group is extreme to the point of not making rational decisions. Interestingly, research has shown that many criminal organizations share very similar group dynamics with normal ones.\textsuperscript{68} The fact is that terrorism is a methodical act perpetrated with some goal in mind. Their objectives would also have to consider the political fall-out from detonating a nuclear device. The act of setting off a nuclear device would have consequences like a loss of political support or threaten the groups’ survival.\textsuperscript{69} Thus, any decision to go nuclear would involve many logical considerations and anything that could interfere with their primary goal might dissuade them from doing so.

\textbf{Should Americans be Worried About Nuclear Terrorism?}

The majority of research material suggests that scholars agree there is a significant threat from nuclear terrorism. In fact, the literature leans towards the belief


\textsuperscript{67} Gurr and Cole, \textit{The New Face of Terrorism}, 168.

\textsuperscript{68} Lynne Snowden, “How Likely Are Terrorists to Use a Nuclear Strategy?” \textit{American Behavioral Scientist} 46, no. 6 (February 2003): 702.

\textsuperscript{69} Falkenrath, \textit{America’s Achilles’ Heel}, 55.
that some form of a terrorist nuclear attack is imminent, in one form or another. On the
other hand, there are scholars who believe that the danger is overstated and that
policymakers should not be excessively concerned. They argue that the world is actually
more secure today than at any period since the beginning of the nuclear age. Some of
the reasoning behind those claims is the number of recognized nuclear states is only nine
and some countries have decided altogether to forgo nuclear status. Furthermore,
significant progress has been made in securing fissile material in the former Soviet
Union through the Nunn-Lugar Cooperative Threat Reduction Program. Also, they assert
that arms control and non-proliferation treaties have substantially curbed the spread of
nuclear weapons and technology around the world. Consequently, policymakers must
decide which set of scholars to believe. That choice will be crucial because whichever
one they prefer will shape the policies that our government will implement.

Proliferation should be a point of concern in any scholarly assessment of nuclear
terrorism. An axiom of proliferation states, “as long as any state has nuclear weapons,
others will seek to acquire them.” Skeptics agree that nuclear proliferation can increase
the number of sources that nuclear material could be acquired from, but disagree that it
would also result in the willingness of states to transfer weapons, or fissile material to

70. Todd Masse, “Nuclear Terrorism Redux: Conventionalists, Skeptics, and the Margin of

71. Ibid., 303. Countries that have abandoned nuclear weapons prior to the NPT entering into
force (1970) include: Egypt, Italy, Japan, Norway, Sweden, and West Germany. Since the NPT’s entry into
force, Argentina, Australia, Belarus, Brazil, Canada, Iraq, Kazakhstan, Libya, Romania, South Africa,
South Korea, Spain, Switzerland, Taiwan, Ukraine, and Yugoslavia have also abandoned their nuclear
weapons programs.

72. Richard Rhodes, *The Twilight of the Bombs: Recent Challenges, New Dangers, And The
terrorists.\textsuperscript{73} Another major area of contention in the competing viewpoints is the security of fissile material. The most important obstacle to building a bomb is the procurement of radiological material. Therefore, the most logical policy to prevent nuclear terrorism is to secure all material so that terrorists would not have the means to achieve their goal. Skeptics argue there are no perfect physical security measures in place to ensure that does not happen.\textsuperscript{74} Instead they prefer measures that make sure the capability and intent of terrorist groups do not ever come together. Their main priority is disrupting a terrorists’ networks ability to operate.

Other cynics believe the cumulative effect of potential barriers in getting fissile material, building a bomb, and transporting it would render the task virtually impossible.\textsuperscript{75} Even though it is entirely possible for nuclear terrorism to occur, they contend that each stage in the process presents obstacles that have to be overcome for an attack to succeed. Therefore, a variety of defense mechanisms can be useful in catching any potential plot prior to it happening. Advocates of this viewpoint say they only have to catch the perpetrators at one point in the process, whereas the terrorists have to evade detection all along the way.\textsuperscript{76} Since operational security is a primary component for any terrorist operation, any barriers that make it difficult to succeed might persuade those planning a nuclear attack to think otherwise.

\textsuperscript{73} Masse, \textit{Nuclear Terrorism Redux}, 304.

\textsuperscript{74} Ibid.

\textsuperscript{75} John Mueller, \textit{Atomic Obsession: Nuclear Alarmism from Hiroshima to Al-Qaeda} (Oxford: Oxford University Press, 2010), 184.

\textsuperscript{76} Ibid.
Multiple layers of security are a good idea for defending against nuclear terrorism. Assessing the probability of an attack and developing countermeasures for areas of vulnerability can help the United States prepare for this threat. A quantitative analysis is used by some to determine the statistical possibility of a nuclear attack. Contrary to Bunn’s mathematical model of 29-50%, skeptics point out that numbers can be misinterpreted. John Mueller, in his work “Atomic Obsession”, introduces a list of twenty tasks that would have to be completed before an attack could occur. By his calculations, if a terrorist group has a one in three chance at succeeding at each of the twenty tasks, this will result in an overall probability of one in three billion. By that measure, any group thinking about nuclear jihad would more than likely use other avenues to achieve their objectives. As a result, these are persuasive arguments why nuclear terrorism might not be an impending threat, as previously thought.

One final consideration is what is being done to combat the threat of nuclear terrorism inside the United States government. Those who believe the threat is great think that U.S. policy measures do not reflect the gravity of the situation. Others who say the danger from nuclear terrorism is small think cost-effective measures can be enough of a deterrent. They advocate low-cost programs like nuclear attribution and greater intelligence on terrorist groups. The principal argument between the two is over the financial strain that a huge security apparatus would have. Fear plays a hand in opening

77. Ibid., 187.
78. Ibid., 193.
79. Ibid., 194.
the purse-strings of government. Doing so can exact huge economic costs on a country, when sometimes more cost-effective and pragmatic solutions could do the job. In the end, there must be a balance between the threat and any measures put forth to reduce the risk of nuclear terrorism.

Summary

Preventing nuclear terrorism is challenging because there are no examples to go by. The problem remains largely theoretical and that is why scholars debate the probability using mathematical or behavioral approaches. These approaches can be useful; certainly a healthy discussion on the topic can help policymakers decide where to place an emphasis when designing measure to protect us. On a similar note, there are two areas that I believe should be highlighted by the United States to address the threat of nuclear terrorism. First, what are we doing to secure fissile material within our borders and worldwide? That is the first and most important obstacle in the development of a nuclear device. Without that one element the task would be impossible. More importantly, securing and accounting for all nuclear material is within our capabilities. The amount of weapons grade uranium and plutonium available today is finite. Thus, programs like the Nunn-Lugar Cooperative Threat Reduction Program, Non-Proliferation Treaty, or Fissile Material Cutoff Treaty can have a significant impact on reducing the worldwide inventory, improving U.S. security as a result.

Additionally, policy in Washington needs to concentrate on a course of action that adequately focuses on ways to limit the ability of terrorists to seek nuclear material. Disrupting their networks and implementing intelligence capabilities to monitor their
activities would help to minimize their effectiveness. The most dangerous groups are the ones with both the capability and intent to pursue nuclear weapons. Understanding terrorist organizations, how they function, and what motives or deters them would reveal more about ways to counter their plans. This approach would be more pragmatic and fiscally viable. Terrorists have an uncanny way of assessing weaknesses and finding ways around high-tech security equipment. The only full-proof way to prevent nuclear terrorism is to remove their capability and disrupt their ability to organize.

There are a couple of arguments brought up by critics that I would like to discuss relating to my previous suggestions. One of them is nuclear proliferation and its relation to terrorism. As mentioned, they bring up the idea that when countries develop new nuclear programs they are unlikely to transfer that knowledge or technology to terrorists. In principal they would be discouraged from doing so because tracing back any material used in an attack would have repercussions for their state. However, state-sponsored terrorism can have many forms. They do not have to physically give them nuclear material or help them outright. Numerous avenues exist that can benefit those in their pursuit. States could provide financial help, safe-havens, or other assistance that would not be grounds for serious retaliation. In that situation, retribution would be in the form of sanctions rather than military force. Furthermore, proliferation increases the amount of material available for terrorists to steal. Proliferation goes in the opposite direction of what needs to be achieved. There needs to be less opportunity for access to radioactive material, not more. My biggest concern is with the security of facilities in countries that newly acquire nuclear programs. They may not have the money or resources for adequate
security. So the spread of nuclear material and lack of safekeeping is the true threat from proliferation.

The second point I would like to make is the apparent difficulty with the process of becoming nuclear capable. According to Mueller’s assessment, the probability of success for nuclear aspiring terrorists is extremely low. The problem I have with statistics is they can be misleading, usually resulting in poor policy decisions. Highly dramatic scenarios get lots of attention and the measures implemented in response can sometimes be blown out of proportion. Conversely, those with low odds are overlooked as never going to happen. Thus, numerous cracks begin to appear in security infrastructures and policies. Yes, the obstacles of planning and executing a nuclear attack are steep. But do we really want to rely on the idea that it is impossible, therefore mitigating our reaction to a potential threat. The critics and I do agree that a more pragmatic approach would be the best response for nuclear terrorism. Less costly and more effective policy measures can be made to significantly reduce the risks. My only wish is that policymakers do not misinterpret low probability with never going to happen. The consequences of that policy decision would be disastrous.

What does this reveal about the nature of nuclear terrorism? As I mentioned at the very beginning of the chapter, the idea that terrorists could acquire nuclear material is as old as the nuclear age. Scholars have been pondering this scenario just as long and have somewhat come to the conclusion that it is a serious threat. However, as Graham Allison’s book title suggests, it is entirely preventable. Many of the safeguards the
United States has in place today emanate from organizations created after September 11, 2001. Are those security measures sufficient for protecting our borders? What kind of detection equipment is currently being used and what are some of the difficulties that arise in fissile material accountability? These are some of the questions that need to be scrutinized before we can decide if the United States is prepared for the threat of nuclear terrorism.
CHAPTER 2
WHAT IS THE UNITED STATES DOING TO PROTECT ITS CITIZENS?

I believe one of the most significant ways the United States can prevent nuclear terrorism from ever happening is to develop a layered security system. In order to intercept potential nuclear terrorists there needs to be many levels of protection. A phased approach has three important areas that should be the primary focus of attention. Foremost, the safeguarding and accountability of nuclear material worldwide should be paramount. Protecting the world’s inventory of fissile material has a direct impact on the security of the United States. This chapter will look at what technologies are used domestically, in addition to the United States role in facilitating nuclear security abroad. Secondly, detecting nuclear smuggling is the next layer of defense. I would like to examine the various technologies used for the detection of radiological particles, including any limitations it might have. Included in this analysis will be a thorough discussion of Homeland Security’s role in securing points of entry into the U.S. and critical infrastructure protection within the country.

Furthermore, security within the nation depends on the intelligence community to monitor and assess the threats posed by terrorists overseas, or operating within our borders. The National Counterterrorism Center is charged with collaborating with multiple government agencies to ensure a seamless process of information sharing regarding terrorist threats. Their mission statement reads, “Lead our nation’s effort to combat terrorism at home and abroad by analyzing the threat, sharing that information with our partners, and integrating all instruments of national power to ensure unity of
effort. Coordination among multiple departments and agencies is needed for greater security. I would like to point out specific cases where this has been beneficial, in addition to circumstances when multiple interests impaired intelligence gathering. Combined together, each stage will provide the U.S. with many opportunities to intercept anyone attempting to smuggle nuclear material into the country. Also, by supporting safeguarding and accountability measures abroad we can further reduce the threat.

Briefly, I will discuss each government agency responsible for facilitating domestic security. My purpose in this chapter will be to determine if those agencies are capable of deterring and protecting against nuclear terrorism. Primarily, securing fissile material is our best option for preventing this danger. The International Atomic Energy Agency has targeted two sets of priorities dealing with nuclear security and safety. For safety they make sure nuclear installations, radioactive sources, radioactive materials in transport and waste are properly guarded. Their security function helps nations prevent, detect, and respond to any attacks or sabotage. Verification of nuclear programs also falls under the jurisdiction of the IAEA. They are the enforcement mechanism for the Nuclear Non-Proliferation Treaty (NPT). This added function provides a robust international safety, security, and inspection regime that is instrumental in making sure that nuclear material and related technologies are used within protocols.

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3. Ibid.
Inside the United States, the Department of Homeland Security has made critical infrastructure protection a major component of its mission. Nuclear reactors that provide energy, transportation systems, and any healthcare or government facilities containing radioactive material are considered critical national assets. Keeping these facilities safe is an essential part of preventing nuclear terrorism. Another key element is the Nunn-Lugar Global Cooperation Initiative. Begun in 1991 as the Cooperative Threat Reduction Program, its mission began as a way to secure and safeguards nuclear stockpiles in the former Soviet Union. Today the initiative aims to mitigate and eliminate common threats to U.S. national security and global security.\(^4\)

The Domestic Nuclear Detection Office and the National Counterterrorism Center make up the detection and security apparatuses for the United States. Additionally, U.S. Customs and Border Protection are responsible for 327 official Air, Land, and Sea ports of entry into the United States.\(^5\) These agencies work together to ensure the integrity of our borders by implementing measures to protect against nuclear smuggling. Now that each agencies role has been defined, I would like to discuss the actual equipment being used in the field. Technology is a key part of the nation’s defenses. The job of detection, security, and accountability can be made easier by using


sophisticated equipment. I would like to explore how effective this technology is. By doing so, I hope to get a sense of our vulnerability to a nuclear attack.

**Accountability**

The best way to prevent unauthorized access to nuclear material is to account, secure, and verify the total amount in existence. Having an accurate count of all material within an arsenal is crucial to its overall security. Unknown and unsecured material provides non-state actors with a major opportunity to obtain fissile material. According to the IAEA’s illicit trafficking database, from January 1993 to December 2009 a total of 1773 incidents of nuclear theft occurred.\(^6\) And from 2009-2010 another 222 incidents took place that involved illegal possession or attempts to trade.\(^7\) These numbers indicate the need to further consolidate and account for nuclear material. It also shows that the availability of unsecured nuclear material still exists. International cooperation has led to consolidation in many countries, resulting in the elimination of weapons-useable nuclear material in nineteen countries.\(^8\) Thus, there has been some progress in this area, however more work is needed before a secure and verifiable worldwide system is in place.

The government body responsible for nuclear safeguards in the United States is the National Nuclear Security Administration (NNSA). The agency is part of the Department of Energy and is divided into specific program areas dealing with various

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7. Ibid.

nuclear challenges. The department within the agency that deals with nuclear security is called the Office of Defense Nuclear Security (DNS). Their mission is to “develop and implement security programs for the NNSA including protection, control, and accountability of materials, and for the physical security of all facilities of the administration.” Their primary objective is to ensure that all nuclear material within the United States is secure and accounted for.

After 9/11 the NNSA installed measures to further secure its facilities from attack. This led to a reduction in the overall number of facilities in operation. The purpose was to restructure in order to provide better security and less opportunity for nuclear leakages. Limiting the number of facilities and strengthening security at those sites is a model that needs to be implemented in other countries. For example, the program is subdivided into areas of protection that are critical to material security. As mentioned the first part is consolidating the number of sites where material is stored. Secondly, those sites must be fortified for maximum protection against an attack. Installing hardened storage vaults as well as anti-air, vehicle, and personnel capabilities help to strengthen the buildings. Also, contingency plans are put in place to deny the enemy an escape route. And trained security officers are needed to adequately defend


11. Ibid.

12. Ibid.
the complex. At nuclear facilities around the world this is a major issue of concern. Some sites are sparsely guarded, while some go totally unprotected. Training must be conducted to make sure that guards are capable of handling the protection of national assets. Thirdly, physical security measures around the buildings can help defend the complex at a low cost.\textsuperscript{13} Barriers, such as fences, concrete fortifications, and limiting access points can improve overall security. Lastly, cyber security is an important feature that must not be overlooked.\textsuperscript{14} Securing classified data and preventing remote access to nuclear installations is just as important as physical defense measures. Improving security at nuclear facilities overseas should imitate the steps that the United States has taken domestically. The U.S. has worked with other nations to reduce the threat by implementing programs aimed at nuclear security overseas.

The NNSA, under the Nuclear Nonproliferation Office, is also home to the Office of Global Threat Reduction. The name of the program is the Global Threat Reduction Initiative (GTRI), and its mission is to reduce and protect vulnerable nuclear and radiological materials located at civilian sites worldwide. The initiative seeks to deny access to the materials needed to conduct nuclear terrorism.\textsuperscript{15} There are three subprograms of the GTRI; Convert, Remove, and Protect. The first program changes weapons-grade nuclear material into a lower enriched form. The second one seeks to

\textsuperscript{13} Ibid.

\textsuperscript{14} Ibid.

remove excess material. And the third program aims to secure and protect at-risk material. The GTRI’s task is to provide a security strategy for its international partners.

The Department of Energy’s Material Protection, Control, and Accounting Program (MPC&A) is another initiative that the United States has used to foster nuclear security. Primarily focused with the countries of the former Soviet Union, it provides a good representation of what cooperation should look like. To date the program has been successful in deactivating over 7,500 warheads and providing safeguards for the material that was used in those weapons.\(^{16}\) Within the program further agreements have been made to make improvements in the infrastructure of many other countries by providing them with safeguards and standards.\(^{17}\)

In general, the National Nuclear Security Administration and the Nunn-Lugar Project have made significant progress in addressing the security of nuclear material around the globe. On the other hand, there are a number of significant points that need to be addressed concerning global threat reduction programs. One reason why nuclear security has been lacking is the costs associated with safeguarding. Countries that develop nuclear programs often put their entire budgets into research and development, leaving little money for proper security. U.S. assistance needs to consider that and encourage others to share the costs. Secrecy is another area of concern for countries that require support. Nuclear programs involve highly classified information and knowledge


\(^{17}\) Ibid.
of operations is therefore very restricted, making verification of overseas activity hard to assess.

The International Atomic Energy Agency (IAEA) is the international body in charge of inspection and verification of nuclear programs. IAEA safeguards are designed to provide timely detection of diverted nuclear materials from peaceful programs into activities that produce material for the construction of nuclear explosive devices.\textsuperscript{18} IAEA inspectors need to be able to detect any diversion before it develops into a full-scale weapons program. This is done by three activities that inspectors perform to verify the accuracy of a nation’s declaration.\textsuperscript{19} The inspectors first check the accounting and operating records of the facility. Next they verify the material itself to check its integrity, making sure it is properly secured. Lastly, they contain the material using tamper-proof seals and install surveillance cameras to monitor the material after they leave. Inspecting nuclear programs is a very important part of nuclear security. Without proper accounting and verification it is possible for material that has been secretly diverted to end up in the hands of terrorists. Therefore, any undocumented material produced poses a serious threat to international security.

Cooperation plays a huge role in determining how much access inspectors are allowed. One of the drawbacks of verification regimes is the fact that they are intrusive. National nuclear programs are considered some of the most guarded secrets in any


\textsuperscript{19} Ibid., 105.
country. Being subjected to periodic inspections by outside examiners can be troublesome. The inspection can be hindered by their level of cooperation and how much they are willing to divulge.²⁰ If the inspectors are allowed the most common argument is over the level of access granted to inspectors. This may be the result of how each party defines how much access is necessary for a proper inspection.²¹ The IAEA might request to see more of the facility then the country is willing. One possible solution is a system that rewards nations for complying with inspections. If they are consistent and have proven over time they are not pursuing undeclared nuclear programs, then the inspections could become less intrusive. This is the approach the IAEA has used to determine the completeness of a country’s declaration.²² Using additional protocols, which require greater transparency on the part of the inspected country, the IAEA can make an overall assessment of a state’s nuclear intentions. Some nations have resisted accepting additional measures to ensure their compliance. Addressing that discrepancy is crucial for preventing the spread of unknown sources that could fall into the wrong hands. Limiting and accounting for all nuclear sources are the primary steps that must be taken to prevent nuclear terrorism.

Another significant consideration in building a worldwide safeguards architecture is the financial commitment needed to make effective safeguards a reality. Who should

²¹ Ibid., 90.
bear the costs of securing nuclear materials? The exact figure that it would take to secure weapons-usable material is unknown.23 Yet, the credibility of any safeguards and verification regime must be backed up by proper funding and the money needed must be shared by all countries.24 The amount of nuclear material has increased over a thousand percent in the past quarter century.25 The IAEA and the U.S. should not have to support the costs of safeguards entirely alone. The United States Cooperative Threat Reduction Program budget for FY 2011 is around two billion.26 Worldwide the costs are estimated to be just under $10 billion, spread among the countries with existing stockpiles. If you compare the $800 billion total amount requested by the Energy, Defense, and State Departments for their annual budgets then our expenditures seem very reasonable.

In general, a comprehensive safeguards system will ultimately rely on limiting or eradicating the amount of new fissile material produced. Costs and cooperation are tough issues that can be handled with skilled diplomacy. Yet, without any controls over the production of new material the system will be overburdened rather quickly. The proliferation of new nuclear material will spiral to a point where it will become impossible to safeguard so much material. The solution proposed by many academics is to approve a Fissile Material Cut-Off Treaty (FMCT) that prevents any new radioactive material from being produced, thus making it feasible to secure current stockpiles. In

23. Bunn, Securing the Bomb 2010, 68.
25. Ibid., 83.
1993 The Conference on Disarmament came to a resolution that an internationally verifiable production ban was needed.\textsuperscript{27} Since that point negotiations over an FMCT have failed to produce any meaningful resolution that would stop the manufacturing of new nuclear material.

Nuclear terrorism can be prevented by not allowing access to the radioactive material needed to make a bomb. Securing, accounting, and verifying all known sources cannot be done unless the amount available is controllable by a fissile cut-off treaty. Negotiations need to move forward so that nuclear security measures can be deployed that have the capacity to handle existing inventories. Once that framework is in place it will be possible to put into practice additional steps that will further strengthen international security. Each additional layer of defense is a roadblock for terrorists. Safeguards are one part of the equation and must be backed up by added defense measures. If accountability failed there must be further steps that can capture the material prior to its use. The next sections are devoted to ways to intercept or actively pursue material that has gone missing. First I will explore the various instruments used for radiation detection followed by ways that our intelligence community can participate if nuclear material is missing.

\textsuperscript{27} O’ Neill, \textit{Verification in an Age of Insecurity}, 114.
Radiological Detection

If preventing nuclear terrorism is going to work there must be a highly effective means to detect smuggled nuclear material. Radiation emits particles that cannot be sensed and are colorless and odorless. In order for it to be detected, sophisticated equipment is necessary that can pick up the particles as they are emitted from the source. Therefore, this technology needs to be sensitive enough that it can single out containers, or freight that has nuclear material hidden inside. In order to coordinate a national plan to detect nuclear smuggling into the country, the Department of Homeland Security has instituted the Domestic Nuclear Detection Office within the agency. The office is responsible for developing global nuclear detection architectures and to deploy domestic detection systems. The Nuclear Detection Office plays a vital part in our nation’s defenses by intercepting smuggled nuclear material.

The DNDO is part of a multi-layered defense strategy devised by Homeland Security. Since no single defense measure is one-hundred percent accurate, this approach allows port agents many opportunities to interdict suspected nuclear smuggling activity. Additionally, the office has also established a National Technical Nuclear Forensics Center to plan and make improvements to the United State’s ability to attribute

29. Ibid., 185.
30. Ibid.
31. Ibid.
the sources of nuclear material.\textsuperscript{32} Most importantly are the programs overseas efforts to protect fissile material. The goal is to provide protection closest to the source by monitoring cargo and containers at foreign ports, utilizing the same detection technology used in American facilities.\textsuperscript{33}

Establishing a worldwide detection system can be beneficial in protecting ports around the globe. It would also have the effect of deterring terrorists from trying to hide nuclear materials inside containers. This form of terrorism involves a strategic calculus that must be used to thwart potential groups. Each barrier the U.S. puts in place is another roadblock. Overall, we want them to think that accomplishing their goals will require a rethinking of strategy. At each stage of the process we want to deny them the ability to succeed. The DNDO’s global architecture is one major component of an overall policy that will deny the enemy that opportunity.

The office has been around since 2005, but its origin can be traced back to the Government Accountability Offices 2001 suggestion for an agency dedicated to coordinating a system to detect nuclear smuggling.\textsuperscript{34} Since its inception it has been tasked with installing the necessary technology and systems that would ensure any smuggled radiological material is found. Unfortunately, the Senate Committee on

\begin{quotation}

\textsuperscript{33} Collins and Baggett, \textit{Homeland Security and Critical Infrastructure Protection}, 186.

\end{quotation}
Homeland Security and Governmental Affairs recently stated that the DNDO has failed to implement its strategic goals, in the process wasting nearly $400 million on two failed technologies.\textsuperscript{35} The agency planned on deploying 1,400 radiation portal monitors at U.S. ports, but has failed to do so because the monitors have been prone to give false alarms.\textsuperscript{36}

The deficiencies in the technologies used by the DNDO illuminate a broader problem in protecting our borders. It shows a fundamental problem with the entire process of installing detection equipment. Money has to be budgeted, the technology then goes through research and development, and by the time it is implemented it may be outdated. In addition, just like the portal monitors mentioned above, the technology may not even be operational. The ability to detect radiation is a tool that cannot take the place of fissile security. A global architecture for securing all material would be much more pragmatic. The thought behind detection is layered security measures. In other words, securing fissile material would be followed by detection technology, which could be further supported by intelligence efforts. Each phase is bolstered by the one preceding it. The main focus should be on developing secure storage facilities for radioactive material. Then if somehow theft occurred, detection measures could be used as a back-up. Detection is important, but too much focus on this area allows for a world where radiological sources are not protected enough and we are depending on detection methods too heavily.

\textsuperscript{35} Ibid.

\textsuperscript{36} Ibid.
What would the detection architecture look like if Homeland Security were able to establish one? Not surprisingly, implementing this structure would have more than one level. It would require establishing multiple parts that work together to provide the most security possible.\(^\text{37}\) The first line of defense would be screening for radiological materials at borders and points of entry into the United States. These checkpoints can be land, air destinations, or seaports that would rely on instruments such as Radiation Portal Monitors (RPMs). After cargo has been delivered to shipping ports it will pass through one of these portals before it leaves the facility. Other entry points, such as land borders or airports also screen for the presence of radiation. The main issue with this technology is the fact that a false-positive alert can set them off.\(^\text{38}\) Naturally occurring radiation can set off monitors, which can cause unacceptable delays for the shipping and transportation industries. Another consideration is the fact that radiation comes in many different forms. Radiation emitted can give off alpha, beta, gamma, and neutron radiation.\(^\text{39}\) In order to detect many different particles given off from radiological sources the technology must be able to detect each kind.

Homeland Security has invested heavily over the past couple of years in the Advanced Spectroscopic Portal Program (ASPs). They operate much like RPMs but are able to detect a larger variety of radiation. The spectroscopic monitors are also designed


to pick out levels of radiation that have gone above pre-selected criteria, also known as background radiation. Being able to differentiate between naturally occurring radiation and actual fissile material was meant to help detect illicit trafficking. Regrettably, the new ASP monitors are the same ones cited by the Senate Committee because they are still plagued with detection problems.

In addition to port security there must be the ability to detect radioactive materials in transit. This means the capacity to track all material as it is being transported on railroads, highways, and waterways. One type of system used is called the Monitoring of Mobile Radiation Sources (MMRS). This system provides a real-time indication of location, radiation levels in the surrounding locals, and an alert if any tampering is detected with the source as it is being transported. The complete system has a command and control center that constantly observes the signal being relayed from the moving platform. The signal comes from a radiation detector that is attached to a radio frequency id tag and GPS locator.

Just like the portal monitors, the MMRS needs to have a low percentage of false-alarms. This is complicated by the fact that the source of radiation is moving. It may pass through locations that could potentially set off the monitors accidentally. Naturally

40. Ibid.
43. Ibid.
occurring radiation is the main cause of false-alarms in border monitoring equipment. Therefore, distinguishing between illicit material and normal substances becomes very problematic. Although we would not have this sort of technology in tracking a terrorist group travelling inside the United States, it is important for the safe delivery of nuclear material throughout the country. If a terrorist group thought that breaking into a nuclear facility was too risky, they might resort to an attack on material in transit. Since nuclear material can be acquired here, American infrastructure security must accomplish two goals. It has to prevent nuclear material from entering the country unknowingly and also protect the assets we have internally. In order for this to be accomplished there also needs to be viable ways to recover any stolen material.

If nuclear theft is detected, the responsibility will fall on a network of law enforcement and intelligence agencies to track and recover the stolen material. All personnel involved will need to work together seamlessly in order to execute effective search strategies. In the case of material being smuggled in, the search will be initially for when and where the material came into the country. If it is stolen internally, the focus will be on identifying a search area to locate where the suspects might have gone. In other words, you need to know where to look before radiation detection technology can be useful. Teams of investigators will also encounter some of the same difficulties that are attributed to others forms of monitoring. For instance, even if intelligence has pinpointed an area where the material might be, the monitors still need to be able to tell


nuclear material apart from naturally occurring radiation sources. Distinguishing between the two can cause delays that might be exploited by terrorists. Therefore, time is a crucial part of recovery efforts. Any time lost is an opportunity for terrorists to assemble and detonate their device. Within that timeframe they could make an improvised device rather quickly. Law enforcement and intelligence capabilities are important, yet their primary objective should be stopping groups well before this stage.

**Improving Nuclear Security Through Intelligence**

The intelligence community has a large role to play in combating the threat of nuclear terrorism. It is their responsibility to work together to deter all terrorism from happening on U.S. soil. Many of the agencies have specific tasks relevant to their mission, yet many departments have similar counterparts in other agencies. In the 2010 the White House released its National Security Strategy stating:

> To prevent acts of terrorism on American soil, we must enlist all of our intelligence, law enforcement, and homeland security capabilities. We will continue to integrate and leverage state and major urban area fusion centers that have the capability to share classified information; establish a nationwide framework for reporting suspicious activity; and implement an integrated approach to our counterterrorism information systems to ensure that the analysts, agents, and officers who protect us have access to all relevant intelligence throughout the government.46

The integration began in 2004 when the U.S. Government passed legislation in order to combine efforts at gathering intelligence and to promote sharing of information between agencies. The Intelligence Reform and Terrorism Prevention Act created new institutions

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to facilitate intelligence coordination. The National Counterterrorism Center (NCTC) was created as the focal point for joint operational planning and joint intelligence. The Center is staffed by personnel from various agencies and is headed by the Director of National Intelligence (DNI). Also at the federal and local level the Department of Justice’s Federal Bureau of Investigation created the Joint Terrorism Task Force (JTTF). The JTTF integrates the FBI, CIA, local police officers and defense analysts in one geographic area to share current intelligence data.47 More locally the government has mandated that each state create a Fusion Center to bring state and local police together with the intelligence community.48 The main purpose of the new agencies is to proactively derail terrorists operations. Greater coordination has allowed organizations that have not typically worked together the ability to share information and to understand the importance of counterterrorism.49 Each agency provides a critical layer of protection in our national defenses and helps to prevent groups from organizing and carrying out acts of terrorism.

The NCTC specifically works at the national level to accomplish counter-terror priorities. They must analyze the threat and share that information with other agencies. Domestically, the NCTC has done a good job of streamlining the intelligence gathering process. Analysts can now access 30 different government computer networks carrying

48. Ibid.
49. Ibid.
around 80 distinct data sources. The reforms over the past decade have done a lot, however there is also a real need for intelligence reform amongst U.S. and foreign countries. Most preparation for a nuclear attack will occur outside of the United States and our jurisdiction. Therefore, not only is it important for our internal domestic and intelligence agencies to collaborate, it is imperative to forge ties with other countries as well. Disrupting terrorist networks close to their base will require close working relationships with foreign governments and their intelligence agencies.

In 2007, the White House released the National Strategy for Information Sharing. One of the principle features of the report was the need for cooperation in sharing information between the United States and foreign partners. The strategic objectives of the plan call for expanding the timely sharing of information between nations. It also means to ensure the information exchanged meets all security requirements and considers the privacy rights of citizens in both countries. This report was part of an overall effort since 9/11 to expand information sharing within our government and to also broaden transparency with other nations. Unfortunately, restrictions on releasing information are likely to tighten up since the disclosure of sensitive documents via the website WikiLeaks. The Obama administration has called the leaks a direct threat to

national security.\textsuperscript{53} Even though restrictions have loosened over the past decade, the leaks could have a disastrous affect on future intelligence cooperation. The result of the leaks has instigated a reassessment of operational security by the United States government.

Regional and local task forces are also a part of the effort to disseminate information down to every level of counter-terror enforcement. The Joint Terrorism Task Force and individual state fusion centers work to make sure that local police are aware and can act to prevent terrorist attacks. The JTTF is comprised of highly trained cells of investigators, linguists, analysts, SWAT personnel, and others from many different agencies.\textsuperscript{54} This integration allows information that was processed at the national level to be easily developed regionally. In other words, there is a much smoother transition into a specific geographic area so that time sensitive intelligence can be acted upon. The Fusion Centers operate much the same way at the local level. They serve as the main center for synthesizing information that has been sent from agencies within the intelligence community. Each one is located in a major urban city and helps to mobilize all aspects of emergency response in case of a national emergency.\textsuperscript{55} Fusion Centers can also send knowledge of activities back up the chain of command as well. Alert law enforcement

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\textsuperscript{53} Ibid.
\end{flushright}
personnel can observe and report suspicious activity that could potentially be a clue in preventing an attack.

Last year the directors of all state Fusion Centers met to discuss what the baseline capabilities of the centers should be. They established four areas that should be the focus of its intelligence gathering capabilities. 56 They developed priorities to receive, analyze, disseminate, and gather information. The establishment of a more integrated national security apparatus has helped to track and disrupt operations before they occur. Other options available are reactive, in the sense that they are deployed after a case of nuclear theft has been detected.

The Nuclear Emergency Support Team (NEST) is the United States rapid response squad for incidents involving nuclear theft. The team was formed in the early 1970s because the topic of nuclear terrorism and extortion were increasingly becoming an area of concern for the U.S. government. 57 During the next few years many groups claiming possession of a nuclear device increased, often claiming ownership of a bomb so their particular demands would be met. 58 For example, from 1970-1993 there were 103 cases of nuclear extortion involving the United States. 59 Since the beginning NEST has been at the forefront of domestic efforts to interdict potential nuclear threats. The literature on its foreign deployments is thin, probably due to the classified nature of its

56. Ibid.
58. Ibid., 27.
59. Ibid., 237-240.
activities. One example of overseas action occurred in the Port of Colombo, Sri Lanka when monitors detected the presence of a radioactive substance.\textsuperscript{60} Five ships, heading to different ports were thought to hold the material. NEST was dispatched to each location to intercept and recover the radioactive material. Once the container had been located, it turned out it contained only scrap metal mixed with traces of radiation. This shows NEST personnel are capable of working internationally, however the full scope of their involvement in international cases is unknown.

Operationally, NEST’s capabilities are obtained from the United States nuclear weapons complex.\textsuperscript{61} Each response team can range from five experts to around a dozen, depending on the character of the assignment. They are made up of researchers, scientists, and analysts with the equipment capable for locating and handling a nuclear device. All personnel and equipment are available for deployment around the globe at any time.\textsuperscript{62} If NEST is called into action, obtaining critical intelligence is a primary part of their mission. Depending on the timeliness of the information, teams may have time to plan, or they might have to leave rather quickly.\textsuperscript{63} Additionally, the quality of the intelligence can determine search strategies because the immediate location of the material may not be known. Searching for the missing material will be their first objective, followed by defusing and handling of the bomb and its contents in a safe

\textsuperscript{60} Ibid., 206.


\textsuperscript{62} Ibid.

\textsuperscript{63} Ibid.
manner. Some of the equipment at their disposal includes hand-held portable monitors for searching small areas and for larger searches they have vehicle-mounted and aerial monitors. Using scientific and technical expertise, NEST teams hope to prevent the unthinkable.

The nuclear support teams are also part of a larger response plan organized by the Department of Energy’s National Nuclear Security Administration. It has developed seven emergency response assets that are capable of handling nuclear incidents before and after an explosion.\textsuperscript{64} Aerial measuring systems detect, measure, and track radioactivity in a contaminated area. Atmospheric Release Advisory Capability is the use of computer modeling to determine the patterns of radioactive dispersal. The Accident Response Group is tasked with responding to a nuclear accident involving U.S. weapons anywhere in the world. The Federal Radiological Monitoring and Assessment Center coordinates those activities with state and local agencies. And the Radiological Assistance Program and Radiation Emergency Assistance Center deals with first response for a radiological emergency by providing medical treatment and putting measures in place to minimize the exposure of those affected.

The measures described above are America’s last line of defense against nuclear terrorism. Ultimately if efforts to secure nuclear materials, disrupt terrorist networks, and detect smuggling fails it will be left to a small few groups, including NEST to prevent a

\textsuperscript{64} Ibid.
Regrettably the success of NEST largely depends on the timeliness and quality of intelligence received. Having the proper intelligence is crucial in this scenario. Without information on where to begin it will be very difficult, if not impossible to pinpoint where the nuclear material might be. This is an obvious point of concern for many in Washington because once terrorists have penetrated our defenses the odds of finding them in time are dramatically reduced.

**Is the American Security System Flawed?**

There are a number of alternative opinions concerning the capabilities of our present security structure. Even President Obama has voiced his concern over intelligence failures which have come dangerously close to a disaster. He pointed out that “systemic failures” led to the 2009 Christmas Day plot that almost downed a U.S. passenger plane. I see two problems associated with intelligence gathering that need to be highlighted. First is the volume of information that is collected on a daily basis. A vast amount of information must be processed, evaluated, and disseminated to the appropriate agencies for action. Secondly, the institutional framework of the intelligence

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66. Ibid., 235.


community is a factor that affects the flow of information.\textsuperscript{69} If the information is not processed in a timely manner, individuals and plots may not be caught in time. Even if the knowledge exists to stop it, the information can get lost in the system.

The governments’ response to the threat of terrorism since 9/11 has been to create an immense counterterrorism capability. Measures to combat nuclear threats have also been included in this restructuring. Large amounts of money have been spent on detection technology and programs to combat proliferation of nuclear material abroad. The increase has not been limited to government agencies alone. Many contractors have taken on the job of counterterrorism through the outsourcing of physical security to supplement the war on terrorism. In all, some 3,984 federal, state and local organizations work on domestic counterterrorism.\textsuperscript{70} Private companies conducting top-secret work total around 1,931.\textsuperscript{71} The dramatic increase in organizations conducting intelligence functions has resulted in inundating the system and negatively affecting the flow of information. The Department of Defense is responsible for the majority of the individual counter-terror programs. Within Defense, there are only a limited number of senior officials that have knowledge and access to most of its activities. Speaking off the record in interviews, some of those officials admitted it is impossible even for them to know the

\textsuperscript{69} Ibid.


full extent of the programs that are being run. In the broader intelligence community, each year analysts publish around 50,000 reports. Such a staggering amount means that some very good analysis is being overlooked.

Another problem with the intelligence process has been the amount of spending over the last decade. Leon Panetta, the Director of the Central Intelligence, admitted last year in an interview with the Washington Post that the current levels of spending by his agency were unsustainable. His reaction was to implement a five-year plan so the CIA would be prepared in case of spending cuts. Other agencies are also at risk because of their overspending. The U.S. government has essentially written a blank check when it comes to national security. Last October the government disclosed that it had spent $80.1 billion last year on intelligence activities and $42.6 billion on Homeland Security. Those figures reflect twice the amount than was spent prior to the attacks in 2001. The efficacy of these appropriations is questionable, because putting more money into expensive defense programs does not equal greater security. With that in mind, policymakers in Washington should not always look at the most elaborate or expensive option. Many other possibilities exist that can reduce the threat of nuclear terrorism.

72. Ibid.
73. Ibid.
74. Ibid.
75. Walter Pincus, “Intelligence Spending at Record $80.1 Billion in First Disclosure of Overall Figure,” Washington Post, October 28, 2010.
76. Ibid.
Summary

The departments and agencies described in this chapter are the principal ones tasked with the core areas of nuclear security. Accountability, detection, and intelligence are vitally important in preventing a nuclear attack. Structurally, the National Nuclear Security Administration and Global Threat Initiatives provide the first layer in our defenses. It is their duty to secure and protect the global supply of fissile material, making sure that it does not get into the hands of non-state actors. The IAEA also plays a part by coordinating with member countries of the Non-Proliferation Treaty, providing accountability and verification for their nuclear stockpiles. As mentioned, the Global Threat Reduction Initiative has made a tremendous impact on the overall vulnerability of worldwide nuclear material. The program has been instrumental in helping many countries consolidate, or even eliminate their weapons-usable material. Materials protection is the most essential element for American security. It is simply impossible to build a nuclear device or even a dirty bomb without having a radioactive source.

While the U.S. has made great improvements in securing existing stockpiles, the next step needs to involve creating global support for eliminating the production of new fissile material. A Fissile Material Cut-Off Treaty is not universally popular with policymakers because of the large budgetary requirements that it would have. However, this is exactly what should be done. Nuclear security depends on the ability to properly account, secure, and verify the material countries possess. Producing new material only adds to the financial burden by having to increase the number and size of storage facilities. Furthermore, new material increases the odds of it falling into the hands of
terrorists. The FMCT is an absolute necessity for the prevention of nuclear terrorism. In the end, the long-term expenditures associated by not adopting that treaty would be greater.

The next layers of defense are what I like to call passive and active protection measures. If a terrorist group does succeed at circumventing all security measures, these procedures are designed to catch them prior to carrying out their plots. Passively, detection is the ability to monitor ports of entry for persons and/or cargo that could potentially be smuggling nuclear material into the United States. Headed by the Domestic Nuclear Detection Office (DNDO), this method is the less aggressive strategy that lets technology do the job. However, monitoring for suspicious people or cargo needs to be conducted at a very high accuracy in order to reduce costly delays. The Radiation Portal Monitors (APMs) and the Advanced Spectroscopic Portal monitors (ASPs) have proven to give high false-alarm rates because of the high levels it must be set to catch sources hidden inside cargo. Uranium can be effectively shielded by lead, and so can many other radioactive sources. Therefore, any small trace sets off the alarm and causes delays while agents search the entire container. I believe portal detectors are a necessary line of defense for preventing nuclear smuggling, although the accuracy of the technology needs to be refined before it can be reliable deterrent.

More active security actions are aimed at engaging the intelligence community and law enforcement agencies to aggressively pursue those who seek to carry out nuclear terrorism. Within this category there are proactive and reactive measures that are devised
to disrupt terrorist networks or respond to incidents of nuclear theft. The National Counterterrorism Center is the primary consolidator of information for the intelligence community. The primary deficiency with their job is the scale of information that must be processed daily. Despite the enormity of the U.S. security infrastructure, the system cannot keep up with the amount of information that is collected. An even when it does flow properly the information may reach decision-makers too late. Lastly, Nuclear Emergency Support teams are one of the final levels of defense. If all else fails they are called in to recover stolen material and to make sure that it is properly handled to prevent any accidental dispersal. Their job relies on timely and accurate intelligence so that any missing radioactive material can be pinpointed. Without that information their job is a lot harder to accomplish. They do possess equipment that can scan areas for traces of radiation, but the problem is many natural sources can trigger their monitors. Thus, the success or failure of NEST largely depends on knowing where to look ahead of time.

Accountability, detection, and security provide a phased approach for preventing nuclear terrorism. Each stage relies on the other so that many opportunities exist to catch terrorists prior to a nuclear attack. The United States already has in place the agencies needed to succeed, but there is still work that needs to be done to improve their shortcomings. Policy choices made by the United States will have a huge impact on the success or failure of global efforts to curb the nuclear threat. Some encouraging policies have recently been passed that reveal the Obama administrations’ commitment to nuclear security. Passing the new Strategic Arms Reductions Treaty (START), is a positive move that incorporates a secure fissile material removal plan. Also, the President has
pledged to secure all worldwide fissile material in four years, which is a step in the right
direction. And passing a Fissile Material Cut-off Treaty (FMCT) would further efforts by
not allowing any new material to be produced. That way securing and accounting for
existing inventories would be within reach. The nature of nuclear terrorism is such that
overseas security of nuclear material is just as important to U.S. security as is our ability
to defend against the threat. Global cooperation is required to prevent a nuclear
catastrophe and our willingness to work together will be a determining factor for
American security. Therefore, I will now compare U.S. policy with the major arms
control and non-proliferations agreements in order to assess their viability in preventing
nuclear terrorism.
CHAPTER 3
THE IMPLICATIONS OF U.S. POLICY ON GLOBAL SECURITY

Nuclear terrorism is not only a threat to United States security, but also for the entire international community. It is a global danger that requires solutions that extend beyond the political interests of any single nation, because it will involve the broader international community working together to combat this threat.¹ Therefore, U.S. policies should take into account the political situations in other countries and use that knowledge to tailor solutions that increase the effectiveness of nuclear security around the globe. The United States cannot afford to alienate other countries with its political preferences. Our country has immense resources that can help mitigate the threat, but we need to maximize its potential by working alongside other nations so that everyone is working on improving security.²

There are two main tracks of U.S. foreign policy that I would like to examine. The first is arms control and nonproliferation policy, specifically relating to the agreements and treaties that have resulted from negotiations. The second is a look at policies concerning nations that have defied the international community by not abiding those international agreements. Particularly, I am interested in case studies of North Korea, Iran, and Pakistan. These nations trouble me because of their unwillingness to obey international law by pursuing nuclear programs outside of safety and verification


². Ibid., 152.
standards. They have offered little access and transparency about their programs and have routinely impeded inspectors from being able to monitor their facilities. What good are agreements when countries can openly disregard its provisions? So far, sanctions and other forms of punishment have not been enough to deter them.

The Nuclear Non-Proliferation Treaty is the main international agreement holding states accountable for their nuclear programs. The NPT is the backbone of the global effort to curb the expansion of weapons and technology and to facilitate disarmament.3 There are 189 signatories to the treaty, comprised of declared nuclear states and those without programs of their own. Under Article I each nuclear-weapon state promises not to transfer weapons or technology to any non-weapon state, and does not help or encourage them to pursue a nuclear program as well. Article II states that non-weapons states cannot receive transfers of weapons and related technology, nor can they receive any assistance in the manufacturing of a weapon. The problem with the NPT is it creates a gap among countries allowed to continue pursuing weapons programs, at the same time restricting those who do not have one. This discrimination is pointed out by one critic of the treaty. He says that rebellion is the result of being denied access to nuclear technology.4 Consequently, the solution for non-weapons states has been to disregard agreements and create programs of their own. Furthermore, he believes atomic inequality was created by the United States viewpoint that it is superior and excused

3. “Nuclear Non-Proliferation Treaty,” March 5, 1970, Treaties and International Agreements Registered or Filed or Recorded with the Secretariat of the United Nations 729, I-10485.

from adhering to the same sets of standards given to non-weapon nations. That conviction has leaked its way into U.S. nonproliferation policy, thereby influencing efforts to protect our country. The case studies will show how detrimental that division has been to U.S. security.

One particularly good example of why cooperation is important is the negotiations for a Fissile Material Cut-Off Treaty. Although no resolution has been agreed upon to date, the treaty would seek to limit or prohibit the production of new fissile material. Such an agreement would have two consequences for nuclear terrorism. Foremost, it would curtail production so that there is less nuclear material available for terrorists. Secondly, it makes securing existing stockpiles more manageable because all material will be accounted for. As a result, the FMCT would be very beneficial for the U.S. because it would reduce the overall costs associated with accountability, detection, and intelligence. The Obama administration has expressed interests in pushing forward with negotiations. Rose Gottemoeller, Assistant Secretary of State for Arms Control, Verification, and Compliance says it is the administrations’ policy to achieve a cut-off treaty very soon. Ultimately, the success or failure of the FMCT will be determined by the policies and strategies the U.S. uses at the bargaining table. In this chapter, the policies of the United States will be analyzed to determine how committed we are to achieving this goal.

5. Ibid.

The Politics of Proliferation

North Korea

U.S. policies regarding the Democratic People’s Republic of Korea’s (DPRK) nuclear program have included both incentives and coercive diplomacy. Nonetheless, Pyongyang has been uncooperative in revealing the full scope of its nuclear weapons programs. They continue to secretly enrich nuclear material with minimal verification of their activities. Consequently, commitments made by North Korea have been disregarded as they continue their nuclear activity. For instance, the 1994 Agreed Framework was formed to provide an extensive political and economic agenda to help the country dismantle its nuclear weapons program. The agreement included provisions to help the North acquire a light water reactor for energy purposes. Also, the U.S. agreed to full normalization of diplomatic relations along with economic aid. Instead of complying, North Korea has used its civilian nuclear plants to reprocess spent material for use in a nuclear weapons program.

Another approach used to try and influence North Korea to denuclearize has been the Six-Party Talks. After their abrupt withdrawal from the NPT early in 2003, the United States proposed multilateral talks that intended to completely dismantle the DPRK’s weapons program. This strategies purpose was to put international pressure on the North to comply. Initially the regime agreed to complete denuclearization if the


8. Ibid., 107.
United States signed a “non-aggression” treaty in conjunction with a large aid package.\(^9\) The United States insisted on a multilateral resolution and refused to give the North any assistance until dismantling was complete.\(^{10}\) Subsequent Six-Party talks have also had minimal success because the United States insists on preconditions that are rejected before substantial negotiations can begin. The problem exists when neither side will accept the other parties’ conditions. Consequently, conditional agreements proposed by the United States have inflamed the present situation with the North. So, how should the United States deal with a country that has constantly proven its unwillingness to work together on a mutually beneficial solution using sound strategies?

Washington’s response has not been comforting considering how Pyongyang’s intransigence has destabilized the Korean Peninsula. This concern cannot be overlooked and certainly needs to be resolved quickly. In fact, the difficulty in containing their program only grows more complicated over time.\(^{11}\) In contrast, the United States’ position is to use “strategic patience” and sanctions to persuade Kim Jong Il’s government into submission.\(^{12}\) While the U.S. waits, they continue working on developing nuclear capabilities. Presently, multilateral negotiations have been set aside in favor of the approach mentioned above. Could this policy be responsible for an


\(^{10}\) Ibid.


\(^{12}\) Ibid.
emboldened North? Over the past year the regime has become increasingly hostile by sinking a South Korean warship, opening fire on civilians in the South and their typical response of threats of war for exercises carried out by the U.S. and South Korea military. The cessation of talks has alienated them from any meaningful discourse that could help resolve the nuclear crisis. The consequences have been very detrimental to nonproliferation efforts by limiting the knowledge we have on their nuclear activities.\(^\text{13}\) Even though the North Korean government has not always been forthcoming, the only way to combat nuclear proliferation is to resume dialogue so we get a clearer picture of what is going on inside the country. Secretary of State Hillary Clinton recognizes an open dialogue is an important function of diplomacy and that hard-line approaches have limits.\(^\text{14}\) So far, the U.S. government has been unable to get Pyongyang to comply with any renewed talks.

The most serious part of the situation is the fact that without any diplomatic exchange it is impossible to understand Pyongyang’s true intentions. Ever since their 2003 withdrawal from the NPT, there have been no enforcement methods to substantiate their weapons declarations. This is particularly troublesome when compared to their proliferation activities with other countries. North Korea has given technical assistance for ballistic missile programs to Iran and Syria.\(^\text{15}\) They are also to blame for the


\(^{14}\) Ibid.

escalation of many nuclear programs across the Middle East that could be destabilizing for the entire region. Without a clearer picture of their activities the U.S. will be left in the dark while they continue to expand their weapons program and trade related technology.

One option is to increase pressure on countries that support the regime. China has been a long-time supporter of Pyongyang and their influence would be instrumental in resolving the impasse with the United States. China has been reluctant because of its own political concerns, but getting their cooperation will be key part of a resolution designed to stabilize the Korean Peninsula. Recently, this message was conveyed by President Obama during Chinese President Hu Jintao’s state visit. Among other issues, the two leaders discussed strategies on preventing a nuclear standoff with the North. Working with China to apply pressure on North Korea will require consistency on our part. One of the primary problems with U.S. policy has been a failure to sustain pressure on the regime. Inconsistency on our part only fuels proliferation because they are not fearful of serious reprisal. For example, during the Bush administration $25 million in North Korean funds were frozen in an overseas bank in Macao. But the sanctions were lifted when the U.S. sought a diplomatic solution instead. The inconsistency in policy has led Kim’s regime to not take sanctions more seriously.


17. Leddy, “Tackling Pyongyang’s Proliferation Trade,” 42.

18. Ibid., 39.
Persuading North Korea to voluntarily give up its nuclear weapons program definitely needs to include negotiations that have force behind them. Pyongyang must realize that the U.S. and the international community will not tolerate their behavior. The reason why this has been so difficult is how the United States approaches the problem. As mentioned, many opportunities have failed because of pre-conditions that have prevented negotiations from happening. As a result no discourse puts Washington decision-makers in the dark over the full scope of North Korean activities. Strategic patience is a flawed strategy and has hurt U.S. nonproliferation goals.

In order to move forward there must renewed dialogue among the members of the Six-Party talks. Proliferation will continue to get worse as the amount of material increases at the North’s facilities. Continuing on the present course will only exacerbate the problem and increase the chances for nuclear terrorism. For a country concerned with regime survival, they are not likely going to give up their nuclear capability. Therefore, focusing on limiting their capability should be supplanted by paying more attention to the spread of that material and technology to other nations. Gaining access to their nuclear installations should be a primary policy concern so that any diversion can be detected by verification and safeguard standards. Then we will be able to assess the full nature of their program which will help promote better security at their installations. Being successful will require a strategy that is non-threatening to their survival. If we show that nonproliferation is our main goal, there is a chance for success.

Iran

Iran is another country that has defied international protocols in pursuit of its nuclear ambitions. The biggest challenge for policymakers is the fear that a nuclear Iran could destabilize the region, sparking a nuclear arms race in surrounding countries. Neighboring states that wish to counter the Iranian threat could potentially seek weapons for their own protection. This raises the question about Tehran’s intentions for having its own nuclear program. Under Article IV of the NPT, states are allowed to pursue nuclear energy for civilian purposes. This has been Tehran’s officially stated declaration for its nuclear program. They have maintained their right under the NPT to have a peaceful nuclear program. So, should Iran’s neighbors fear a country who officially says their only motive is to have a source of nuclear energy?

Iran’s actions have not coincided with its legal obligations under the NPT or its declarations. The United Nations over the years has issued Security Council Resolutions and imposed sanctions on Iran for not submitting to verification and monitoring. The treaty requires they obey certain restrictions on the production of material as well as allow inspectors to affirm their declarations. Their failure to comply with IAEA inspections and safeguards has only added to suspicions about Iran’s true intentions. The pattern of Iran’s behavior has many U.S. officials worried about the consequences of

21. “Nuclear Non-Proliferation Treaty.”
22. Ibid.
23. Caravelli, Nuclear Insecurity, 117.
what a nuclear Iran would do to stability in the region. The gap between Tehran’s rhetoric and their actions has everyone guessing about how to handle the situation. In addition to regional stability, some troubling unknowns include the linkage Tehran would make between nuclear capability and political objectives, which has major implications for Israeli security. More benign concerns about material security are not known unless the IAEA can access its facilities. These are some of the issues confronting U.S. policymakers who are planning strategies for many possible scenarios with Iran. Those policies need to encourage cooperation with Tehran, while also keeping regional actors from pursuing nuclear programs of their own.

One possible explanation for Iran’s pursuit of nuclear weapons is a hedge against American supremacy in the region. The wars in Iraq and Afghanistan have brought hundreds of thousands of U.S. troops within very close proximity to Iran. U.S. warships transiting to the Persian Gulf must pass through the Straits of Hormuz, which Iran shares a border with. Therefore, American presence in the region certainly is a strategic factor for Iran’s leadership. As early as 2000, the United State has threatened Iran with preemptive military strikes against its nuclear sites. Iran has taken that warning to be credible because of the large American military presence in the region. Much like North Korea, Tehran is concerned with regime survival. They view U.S. bases in the region as a very direct danger to their continued existence. Regime survival is a powerful

24. Ibid., 95.
25. Ibid., 119.
motivator that needs to be addressed in U.S. policy. Consequently, policies since the 2003 invasion of Iraq have put Iran on the defensive. Diplomacy has faltered because of the lack of information we have about their country. There is a deficiency of understanding in Washington about many aspects of the country that are relevant for planning purposes. Intelligence on their domestic political and economic situations could provide U.S. decision-makers with more insight into ways to approach them. Unfortunately, for the past decade we have adopted a confrontational policy that has led to decreased interaction between our governments.

Like the previous case study, dialogue is going to be fundamental to the outcome of the situation. Politically charged statements that encourage war should be not be used in announcements concerning Iran’s nuclear program. The problem with issuing harassing statements is eventually you might have to follow through on your word. War might break out simply because the U.S. is committed to a policy that only has one solution for handling a nuclear Iran. Furthermore, back peddling would be detrimental to any further negotiations if the U.S. did not follow through on its policy choices. The division between Washington and Tehran has cost the U.S. the ability to influence Iranian leaders and their policies. Now there is little that we can do to stop them from continuing their program. Our policies have alienated Iran from working cooperatively because they fear U.S. hegemony and its implications for their nation. Our future ability

27. Ibid., 320.

28. Ibid.

29. Caravelli, Nuclear Insecurity, 126.
to engage Iran will center upon a renewed strategy that reduces the uncertainties they have about our purpose in the area. It will also need to consider the potential for a nuclear arms race in the region. The two most important factors that could destabilize the region are poor decision making and their weapons program. If we were to preemptively attack Iran, the consequences could undermine regional security. Additionally, their nuclear program could also have the same effect by increasing proliferation in other countries seeking to counter Iran. Both scenarios are equally troubling, therefore interaction with Iran and its neighbors must be an integral part of the strategic calculus and one that should not be taken lightly.

What do Iran’s neighbors say about its nuclear ambition? Their proximity puts them in much more danger than the U.S., a fact not lost on surrounding nations. Some of the Arab countries welcome U.S. intervention in Iran to prevent them from using nuclear weapons for regional supremacy.\(^\text{30}\) Their concern is whether Tehran will use its influence as a nuclear power state to exert political, economic, or military influence. The Arab countries think so, prompting many of them to take measures to ensure their future security.\(^\text{31}\) In the past couple of years many Arab countries have announced plans to start civilian nuclear programs.\(^\text{32}\) Despite what they say, it is easy to imagine many countries are beginning their own nuclear programs as a response to Iran. If viewed in context of


\(^{32}\) Ibid.
the historical animosities that exist between some of these countries, it is evident that a nuclear arms race in the Middle East would be devastating.

Cairo and Riyadh have been the traditional power centers of the region. Clearly the differences between Sunni Arab states and a nuclear Shi’a Persian state would be cause for concern. Other problems would involve Iran’s attitude towards Israel. Iran is very clear on its stance towards Israel and any provocation might have the potential to escalate into a nuclear exchange. In other words, regional stability could be unhinged by a nuclear arms race as well as through policies Tehran adopts after becoming nuclear. Although we cannot predict the political decisions Tehran will make by having nuclear weapons, there is clear evidence that an arms race is developing in the region. Defense spending in the Middle East has increased 40 percent in the last decade. Even though the expenditures only partially reflect money spent on nuclear programs, this trend is something that needs to be watched closely. So, how should the United States engage a country it has had little direct diplomacy with? The answer is through multilateral negotiations that seek to open up communication.

U.S. policymakers should note that talking is far better than the alternative. Very rarely do negotiations result in war merely from disagreements at the bargaining table. On the other hand, not talking often leads to misunderstandings in policy. If the United States is serious about global security and nonproliferation it should not let differences get in the way of substantial talks with Iran.

33. Ibid., 10.

34. Ibid., 11.

Pakistan

Unlike the previous two case studies, there is no ambiguity about Pakistan’s nuclear intentions. The country has been recognized by many policymakers to be the intersection of nuclear weapons and terrorism. The reason for this conclusion is the region between Pakistan and Afghanistan, called the Federally Administered Tribal Areas (FATA). Al Qaeda is suspected to have created a safe haven in the FATA to rebuild its organization. To put this in perspective, Pakistan is a declared nuclear country with best estimates of their stockpiles at around 85 nuclear weapons. Having a large arsenal in close proximity to a terrorist network is very serious for the prospect of nuclear terrorism. This puts nuclear material within reach of Al Qaeda, a situation that must be addressed in U.S. policy with Pakistan.

Diplomatic relations between our countries has to reflect a willingness to discuss the issue of harboring terrorists. Open discussion with Islamabad is a little easier than the aforementioned countries because they are traditionally an ally. United States policy should promote better cooperation with Pakistan in handling non-state organizations operating inside of its borders. One aspect of countering nuclear terrorism is denying actors the ability to operate and plan operations. If we are able to destroy safe havens then the threat will be greatly reduced. Therefore, U.S. policy should strongly press Islamabad to seek out and remove terrorists from its country.

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37. Ibid.

38. Ibid., 67.
Additionally, another concern is the size of Pakistan’s nuclear arsenal. Analysts have estimated they are on track to surpass Britain as the fifth largest nuclear power.\(^{39}\) Since 2008, intelligence has determined their stockpile has increased to around 90-110, up from the previous estimate.\(^{40}\) Furthermore, Pakistan is opposed to a fissile material cutoff treaty because of their rivalry with India. Officials in Islamabad believe that restricting further production of nuclear material would give India a nuclear advantage.\(^{41}\) Their objections have stalled negotiations on a treaty that would be beneficial for curbing proliferation.

The implications for nuclear security in Pakistan are stark. Its buildup has created more fissile material, which increases the probability that terrorists could acquire nuclear material. A fact that should have policymakers worried because of the reported terrorist hideouts in northwest Pakistan. Their inability to eradicate non-state actors from operating inside their borders has put a real strain on relations with the United States. Even though Pakistan’s nuclear weapons are a counter to neighboring India, U.S. policy cannot ignore the fact that extremists are operating very close to those stockpiles. That is why the United States must act to prevent any material from being stolen or transferred to terrorists. There are two possible policies the U.S. can choose to confront terrorism inside Pakistan. The choices are unilateral military action or economic assistance.


\(^{40}\) Ibid.

Washington seems to have chosen the military route. Predator strikes inside of Pakistan are increasing, becoming an important part of United States counterterrorism strategy. This strategy is an indication by policymakers in Washington that Pakistan’s government has not done enough to remove extremists from its country. This policy also highlights another part of the overall U.S. nuclear security strategy, which is our ability to disrupt terrorist networks to prevent them from planning and organizing. So far Pakistan has been reluctant to do so, therefore the U.S. has increased its assault on what it believes is a breeding ground for terrorism. Even though the focus is on combating Al Qaeda and the Taliban, policymakers in Washington have not forgotten the lessons from A.Q. Khan’s former black market enterprise.

His network facilitated the proliferation of nuclear technology around the globe. The damage to nonproliferation efforts can be seen in the nuclear programs of Iran and North Korea, both of those countries had ties to Khan’s black market. Although Khan has been stopped, how do we know if there are more insiders looking to make a profit? Khan had a group of scientists working for him and any one could potentially start their own business. The “intersection” of nuclear terrorism resides inside Pakistan’s borders and should be one of the most visible aspects of U.S. policy.


44. Caravelli, Nuclear Insecurity, 91.

45. Ibid., 92.
The United States has also tried giving economic assistance to Pakistan. Further policy recommendations include ways to change the anti-American sentiment in Pakistan and elsewhere.\textsuperscript{46} The purpose of these policies has been to combat the roots of terrorism by changing the way America is perceived and to provide economic aid to Pakistan.\textsuperscript{47} However, the United States has failed in the implementation by adopting strategies that only serve to instigate animosities in the Pakistani people.

Many in Pakistan believe that ordinary citizens are paying the price for the previously mentioned drone attacks.\textsuperscript{48} Acting unilaterally inside another country can be viewed as an assault on their anonymity. The effectiveness of the drone program should not be the only thing U.S. policy considers. The New America Foundation, which tracks the C.I.A. program, has estimated that from 2004-2011 a total of 2,189 people have been killed as a result of drone attacks.\textsuperscript{49} Despite the precision involved in the strikes, not all were militants. Collateral damage, no matter how little, has hurt America’s image. The U.S. can really reduce terrorism in the long term if we address what breeds terrorism. Poverty and hopelessness factor into personal decisions to become a holy warrior. Tackling these areas will have more success than a controversial program designed to kill people. This will help America regain its credibility in a very volatile region.

\textsuperscript{46} Graham, \textit{World at Risk}, 69-71.

\textsuperscript{47} Ibid.


The case studies illustrate some of the difficulties associated with promoting counter-proliferation. Unfortunately, these issues are not specific to any particular country, but are part of a larger problem with U.S. nuclear strategy. The 2010 Nuclear Posture Review advocates that nuclear proliferation and terrorism are major threats to national security.\textsuperscript{50} To support the initiative, new funding was authorized by the administration to promote nuclear security around the world. The National Nuclear Security Administrations Fiscal Year 2012 budget requests $11.8 billion to invest in nuclear security, although this amount will be decreased because of the budget crisis.\textsuperscript{51}

The contradiction in U.S. policy does not stem from how much money the U.S. appropriates towards nuclear security. Money alone cannot cure the threats of nuclear terrorism and proliferation. It comes from the policies that are directed towards other non-nuclear states. The United States still adheres to the belief that the Nuclear Non-Proliferation Treaty is the cornerstone of the non-proliferation regime.\textsuperscript{52} The U.S. retains its nuclear superiority, while other countries have been put under strict international controls regarding their programs.\textsuperscript{53} The discrimination has given many countries reason to ignore international controls and pursue nuclear programs of their own. On the one

\begin{itemize}
\item \textsuperscript{53} Falk and Krieger, \textit{At the Nuclear Precipice}, 84.
\end{itemize}
hand, the U.S. has limited the nuclear aspirations of countries that it considers irresponsible and at the same time accepts nuclear programs in states like Israel, India, and Pakistan.\textsuperscript{54} The inconsistency has encouraged many nations to set aside U.S. policy altogether, because they have energy and security needs of their own.

The Non-Proliferation Treaty is an integral part of this dichotomy. The treaty permits non-weapon states to obtain peaceful nuclear programs, so long as they forego developing nuclear weapons. However, the technology used in civilian facilities lays the foundation for weapons capabilities.\textsuperscript{55} In exchange, nuclear powers such as the United States promised to substantially reduce their arsenals. Although cuts have been made, by no means does it put the non-nuclear states on a level playing field with the nuclear powers. The term used to describe this discrepancy is nuclear apartheid.\textsuperscript{56} It is a system that has labeled countries as either trustworthy or incapable of possessing nuclear weapons. Therefore, nuclear disarmament under the NPT allowed the superpowers the ability to retain their arsenals, while limiting others from joining the club.\textsuperscript{57} Instead of abiding by the NPT, nations that felt left out decided to pursue their own programs by converting civilian technology into nuclear ones. I used the previous case studies to illustrate my point about the various statuses placed on them by the superpowers. North

\textsuperscript{54} Ibid.


\textsuperscript{56} Maddock, \textit{Nuclear Apartheid}, 1.

\textsuperscript{57} Ibid., 9.
Korea, Iran and Pakistan have all been treated differently by the United States, which has sent mixed messages about exactly what U.S. policy stands for.

Labeled as a rogue state, North Korea withdrew itself completely from the NPT, resulting in the ability to expand their nuclear weapons program beyond previous known levels. More troublesome is the fact that being outside of any verification measures puts the world in the dark in regards to its capabilities and intentions. Pressure by the United States to halt its program resulted in a situation that has ultimately hurt nonproliferation efforts. Without inspections and verification there is little that can be done to ascertain the scope of their program. Certainly the international community does not want to increase the number of nuclear states, but it can do little to stop them if knowledge about their program is scarce.

In comparison, Pakistan is a nuclear capable country that remains an important ally with the United States. They are not a member of the NPT, yet remain unpunished for its increase in weapons and fuel production. They harbor extremists inside of their borders and do little to confront the issue, and the true extent of the damage done by A.Q. Khan’s network is unknown. Interestingly, Washington has ignored much of this activity in exchange for cooperation in the war on terrorism. Islamabad has been willing to cooperate just as long as economic aid is being funneled its way. Yet, they are not interested in actively disrupting the safe havens themselves. Drone attacks have created anger in a region that already does not view America favorably. The reaction of its citizens to these unilateral moves is a harbinger for U.S. nuclear strategy. The
relationship between the capitals is already shaky and any disruptions of the status quo could sever that partnership and leave a country that possesses nuclear weapons in a violent intersection with militant extremism and domestic unrest.

Iran is the last example of U.S. nuclear policy mistakes. They are a member of the NPT, yet chose to loosely obey the requirements that come along with being a member. Tehran has recognized they can skillfully avert severe international penalties by diverting the material used for its civilian program under Article IV to build a latent nuclear capability. Sanctions that have been imposed have not seriously hindered their resolve, nor have they been effective in pressuring them to stop. Therefore, they maintain the right to build a civilian nuclear program, while the foundation for a nuclear weapons program is laid. The U.S.’s response has been to threaten them with military action and from their viewpoint they see American presence in the region as a direct threat to their survival. U.S. policy cannot afford to distance itself from Iran due to regional actors seeking a deterrent to an Iranian bomb. A regional nuclear arms race would exponentially increase the threat of nuclear terrorism.

Summary

These countries represent the largest nuclear threats to the U.S. and the world. They are some of the hotspots the Obama administration must seek to contain in order to prevent the spread of nuclear weapons and technology.\textsuperscript{58} To accomplish this goal U.S. policy must be consistent and the same standards must apply to every country. Otherwise

our policies lose credibility because we say one thing and do another. The case studies perfectly demonstrate the point I want to make regarding nonproliferation. North Korea, Pakistan, and Iran are exploiting the inconsistencies in our policy to their advantage. Each time they defy international sanctions and protocols, what kind of signal does that send to the rest of the world? It shows the flaws built into the nonproliferation regime by allowing some countries to keep nuclear weapons, while restricting other from possessing them. Pakistan is not a member of the NPT, yet they are allowed to keep an arsenal without any form of punishment. Iran is a member but not allowed to seek weapons under the treaty. And North Korea unilaterally withdrew itself from the treaty with little forewarning. This is hardly the picture of a functioning nonproliferation regime. If nations are held to different sets of standards, then it entirely undermines nonproliferation efforts. U.S. policies should focus on decreasing the desire for nuclear weapons by showing a commitment to significantly cutting its own arsenal. Doing so would reduce the disparity among nuclear and non-nuclear states and lend more authority to nonproliferation efforts.

The continued focus of nuclear weapons in United States security strategy furthers the image that they are legitimate forms of power. Countries seeking a boost in power and prestige need to be discouraged from seeking nuclear weapons as a means to increase their international standing. Instead, when countries see that a superpower still considers them an integral part of its security strategy, it tends to weaken attempts to persuade them not to pursue weapons themselves. Therefore, the United States should be seeking to delegitimize nuclear weapons by committing itself to a substantial decrease in
its own arsenal. This would have a stronger effect on countries rather than the
confrontational approach favorable in Washington. Preventing nuclear terrorism should
not rely on failed policies because the risks are too great. Our goal should seek a renewed
nonproliferation regime mindful of the messages our policies send.
After a thorough study of the United States security environment and foreign policies relating to curbing proliferation I find that the United States is not prepared for the threat of nuclear terrorism. This outcome was taken from the conclusion that technological mechanisms to prevent nuclear terrorism must support sound policies. In other words, I believe the countries layered security infrastructure is somewhat adequate for combating the danger. Yet, U.S. policies have endangered the world by encouraging proliferation to a point that defensive measures cannot keep up. The global spread of nuclear weapons has increased exponentially due to a failure to contain it from spreading. Poor security increases the probability that terrorists could acquire nuclear material, but failed nonproliferation policies have allowed that to occur by increasing the number of countries possessing nuclear weapons. Therefore, our level of preparedness must be measured by the policies aimed at controlling proliferation.

One of the primary insights I found during my research was the motivations and disincentives of perpetrating nuclear terrorism. It is unknown what would actually motivate a terrorist organization to switch from conventional attacks to nuclear ones. Most likely going nuclear would involve a long process of escalation in the scope of their attacks. Also, aspects of their organizational culture and capabilities would be instrumental in determining their intention to seek nuclear weapons. Disincentives include the time and resources required for constructing a bomb, in addition to fearing reprisal for using nuclear weapons. My study found that many citizens think terrorists are
illogical and do not exercise discretion when planning and conducting operations. This is simply not true because many considerations have to be taken into account before planning an attack of any magnitude. Most operations are well thought out and executed with a high degree of competency. Thus, it is a mistake to think that terrorists do not recognize their own capabilities and limits. Interestingly, I found a small amount of scholarship relating to the social dynamics of a terrorist group. There is plenty of research on the actual structure of some groups, but knowledge about their social interactions is lacking. Analyzing the motivations and disincentives suggests that not every group capable of nuclear terrorism would go ahead and seek nuclear capabilities. Even though some scholars believe the threat of nuclear terrorism is overblown, U.S. policy must reflect that some groups desire to make nuclear bombs. And further efforts should be made to better understand terrorist organizations so that those with the intentions to become nuclear are stopped well in advance.

The United States response has been to create a large security apparatus to handle counterterrorism and nuclear security issues. These organizations cover the main danger areas stemming from nuclear smuggling. The National Nuclear Security Administration handles radiological accountability and safekeeping. That agency even has outreach programs to aid other countries to secure their material. Additionally, the Domestic Nuclear Detection Office is responsible for detecting smuggled material at points of entry into the United States. And the intelligence community is tasked with attempting to disrupt terrorist networks so the threat is diminished by removing their capability to plan and conduct operations. Overall, this approach is good as long as the intelligence
community can keep pace with the amount of information that it receives. The problem arises when there is so much information coming into the system that it cannot be properly processed and disseminated. This has implications for nuclear detection because intelligence works in concert with detection technology. The equipment used at U.S. borders is not entirely accurate. There is the possibility for material to be shielded and smuggled past detection equipment due to the vast amount of cargo passing through each day. Most interceptions have been the result of information received about stolen material from specific places. Additional detection measures can be implemented if border security knows where and what to look for. Without that knowledge it is very difficult to intercept nuclear material. The vast national security system of the U.S. only serves to complicate the timely flow of information that is critical for nuclear detection. The focus of U.S. policy over the past decade has been to rely on expensive technologies and an inefficient bureaucracy to mitigate the threat of nuclear terrorism. Unfortunately decision makers have neglected policies that would better secure our nation and would be far cheaper than our present strategy.

The most troublesome feature of U.S. strategy is the inconsistencies of our policies relating to nuclear proliferation. Each of the case studies showed that some countries are treated differently leading to the effect of fueling the nuclear arms race around the globe. For example, if one country decides that it would like to pursue a civilian nuclear program they are allowed to under the nonproliferation treaty. Consequently, that same technology can be used to enrich material into weapons-grade form and make nuclear bombs. Surrounding countries that fear a nuclear neighbor
respond by pursuing a program of their own, creating a domino effect. The United States has responded by acknowledging countries like Pakistan and Israel’s right to pursue nuclear programs, while trying to stop others from obtaining any capability. Nuclear weapons programs are costly and time-consuming projects and use considerable national assets to build and maintain that capability. I truly believe that countries seek nuclear weapons because they perceive a threat to their country by other nuclear states. Having power over another nation is a huge advantage that surrounding states seek to prevent. The United States has allowed this to occur because the legitimacy of nuclear weapons has not been diminished. Consequently, the main nonproliferation regime has been damaged by the reliance of a nuclear deterrent so ingrained in American military strategy.

Without sound policies, the spread of nuclear weapons and technology goes on unabated. Defensive measures will never be able to keep up with a flawed system that allows more nuclear material to be made and transferred without any controls. Technology is an important part of a comprehensive strategy on nuclear terrorism, but more effort should be placed on reshaping diplomacy. Under no circumstances should disagreements inhibit the ability to negotiate, because such instances allow us to better understand the intentions of other nations. And lastly, more countries would take us seriously if the U.S. abided by its treaty commitments and made drastic cuts in its nuclear arsenal. Such a gesture would renew credibility in counter-proliferation efforts by reducing the discrimination that has plagued the NPT since its inception.
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