

OKING THOUGHT AND ENCOURAGING DIALOGUE ABOUT THE WORLD

Foundation

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# Securing All Nuclear Material

Prioritizing Nuclear Security Bombmaking 101 S Nuclear Security Summit Z Stemming Proliferation

# Normal Securing the Material, Eliminating the Threat Why it must remain a top priority

for world leaders

when thinking of the implications of such an act. The world's leaders say nuclear terrorism is the greatest threat we face—with good reason.

There are clear indications that Al Qaeda has been actively seeking nuclear weapons for years. There's ample evidence, including a statement from the man himself, that Osama bin Laden sought and was prepared to use a nuclear weapon. We also know that Pakistani scientist A.Q. Khan and his network sold nuclear secrets worldwide. There are regular media reports about smuggling incidents that seem to indicate a black market for weapons-usable nuclear material.

The explosion of one crude nuclear bomb in any major city would change the world forever. Not only could it cause death on a mass scale, but it could also trigger global economic disruption, environmental degradation, and a wider conflict requiring a military response. According to nuclear security expert Matthew Bunn at Harvard University, "a 10-kiloton bomb (equivalent explosive power to 10,000 tons of TNT and modestly smaller than the Hiroshima bomb) detonated in midtown Manhattan in the middle of a workday could kill half a million people and cause \$1 trillion in direct economic damage."

Admittedly, experts don't agree on how high the odds are that a nuclear terrorists bomb will be detonated in the next ten years. Some say it's as low as 1 percent and others say it's as high as 50 percent. But even if there's little chance of it, working to eliminate the threat is an investment well made by world leaders.

The easiest way to prevent a nuclear attack by terrorists is to make sure they don't acquire weapons-usable nuclear material. Securing these materials is crucial because once terrorists have acquired enough, then it becomes significantly more difficult to stop them from using the material in a bomb. In this issue of *Courier*, you'll find an overview explaining the nuclear material of concern, where it is in the world, and how feasible it is that terrorists could build a bomb with the material.

Shortly after his election, President Obama made preventing nuclear terrorism a top policy priority. In a public speech in Prague in April 2009, he declared that the United States would lead a global effort to secure all materials in four years. A year later in April 2010 Obama

Lock Down. A policeman stands guard near a container of highly enriched uranium being shipped by train after removal from a research reactor near Warsaw, Poland. Since a summit in 2010, world leaders have put renewed emphasis on securing weapons-usable nuclear material to prevent it from falling into the wrong hands. (NNSA photo) hosted 47 world leaders at the first ever Nuclear Security Summit in Washington, DC.

All nations attending the Nuclear Security Summit last year agreed to take measures to keep terrorists from acquiring nuclear material and most made specific pledges to take action. In an article by Michelle Cann, research analyst at the Partnership for Global Security, you'll find an analysis of the progress made toward these commitments. Next year world leaders will come together once again for a second Nuclear Security Summit in Seoul, South Korea.

The United States cannot solve this problem alone. Nor can governments. Only truly global cooperation across all sectors can prevent nuclear terrorism. Also in this issue, the foundation's director of policy and outreach Keith Porter takes a look at a "whole of society" approach to addressing the problem.

There has been a serious effort to scoop up and lock down the world's nuclear materials since the end of the Cold War. Yet nearly 20 years later, we are far from having all of the materials secure. And we are at risk of them falling into the wrong hands.

Almost three years ago the Stanley Foundation began a programming effort focused on the security of weaponsusable nuclear materials. From our point of view, preventing a nuclear terrorist attack from taking place anywhere is an

From our point of view, preventing a nuclear terrorist attack from taking place anywhere is an achievable and common sense goal.

achievable and common sense goal the world's governments can agree on. The stories in this edition demonstrate how securing the material eliminates the threat.

> —Jennifer Smyser Program Officer, The Stanley Foundation

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## "Doesn't Take a Manhattan Project"

A nuclear terrorist attack is plausible, but it's also preventable

Smuggler's Paradise. A simple Russian army checkpoint marks a border crossing between Moldova and Transnistria, a breakaway territory of the

former Soviet Union through which authorities say weapons-usable uranium was recently transported to a possible buyer in North Africa. (Photo by Samuel Aranda/Corbis)

Tucked between Moldova's Dniester River and the western border of Ukraine is a narrow strip of land seemingly frozen in time following the collapse of the Soviet Union: the breakaway territory of Transnistria.

Its independence is only recognized by three non-UN members, including other breakaway republics like South Ossetia. It has its own parliament, its own small army, and its leaders pine for the old days of Soviet power.

It's also a smuggler's playground: A place where borders aren't monitored, authorities are easily bribed, and air travel in and out of the region can go undetected. And it's precisely the place that Moldovan authorities say 2.2 pounds of weapons-usable uranium may have been recently transported by traffickers trying to connect with a North African buyer.

While that amount of uranium is minor—you need about 60 pounds of highly enriched uranium (HEU) to construct an improvised nuclear device—more worrisome is the implied confirmation that a buyer for the material exists. That's because building a nuclear bomb isn't really the hard part. The real challenge is in creating or obtaining the fissile material needed for a bomb.

"Repeated government studies have concluded that it doesn't take a Manhattan Project to make a nuclear bomb," said Matthew Bunn, associate professor at Harvard University's John F. Kennedy School of Government and co-principal investigator for the Project on Managing the Atom. "Making the actual nuclear material was 90 percent of the Manhattan Project. So if a terrorist group got a hold of the uranium or plutonium it needed it could make a crude nuclear bomb."

## Assembling a Weapon

There is fissile material spread throughout hundreds of locations in dozens of countries around the world enough to build more than 100,000 additional weapons, according to the Fissile Material Working Group (FMWG), a coalition of nuclear security experts.

So if a terrorist group bent on detonating such a device got their hands on the material, how could they actually create a nuclear explosion? Unfortunately, in the case of HEU, it's as simple as slamming two well-machined pieces of the metal together at a high velocity using conventional explosives, Bunn said.

The simple "gun-type" design was used in the bomb dropped over Hiroshima, Japan. And replicating it isn't difficult. Bunn says a terrorist group would need only a small team to assemble a weapon: someone capable of casting and machining a metal like uranium, a conventional explosives expert, an electrician, and a general technician.



And transporting such a weapon isn't difficult either. It's not that radioactive, and it is safe to handle. And with the proper casing, it would likely not be picked up by radiation detectors at a border or port facility.

"It's hard to make a safe, efficient, reliable nuclear weapon that can be delivered from the air or by missile," he said. "Making a crude, unsafe nuclear bomb that might fit in the back of a van is much, much easier."

## So How Do We Stop It?

The key to preventing a nuclear terrorist attack lies in properly securing fissile material like HEU wherever it exists in the world. That's actually the only sure way to prevent such an attack, Bunn said, because once enough material to make a bomb falls into the wrong hands, stopping an attack may be impossible.

"The reason nuclear security is so important is that while the material is in a place where you know where it is you can take measures to keep it from being stolen," he said. "Once it's out the door, it could be anywhere. And all the variations of defense from that point are variations of looking for a needle in a haystack. So once it's out there, looking for wherever it might be is a very, very difficult problem."

The good news is, despite the Moldovan smuggling incident, there are few cases of known theft or loss of fissile material—18 to be exact, according to the International Atomic Energy Agency. And almost all of those involve people who somehow obtained the material and were duped by authorities while looking for a buyer.

"Anyone trying to sell material has a huge problem because they have to figure out whether the person they're trying to sell it to is a government agent or a scam artist," Bunn said. "Al Qaeda has been reportedly scammed on multiple occasions. And a number of smugglers have fallen prey to government sting operations."

"The more we can weaken that market, the harder it will be for real buyers and real sellers to connect with each other."

> —Sean Harder Program Officer, The Stanley Foundation



The Road to Seoul Summit process shines spo terrorism Summit process shines spotlight on nuclear

here are few photo ops in the fight against nuclear terrorism. Typically, a small, committed group of government officials and international experts quietly negotiate agreements and take actions outside of the public's view to reduce the risk of plutonium and highly enriched uranium (HEU) from falling into the wrong hands. However, citizens around the world received a rare glimpse into what exactly is being done to keep us safe when President Barack Obama convened the largest ever gathering of world leaders in Washington, DC, in April 2010 for an unprecedented Nuclear Security Summit (NSS). Two years later, world leaders and international organizations will reconvene in Seoul, South Korea, for a second NSS where they will assess how well they have fulfilled commitments made in Washington and take new steps to strengthen global nuclear material security.

A principal achievement of the Washington summit was gaining agreement among all 47 nations in attendance that nuclear terrorism is among the top global security challenges of our time. Reasoning that strong nuclear material security measures are the most effective way to prevent nuclear terrorism, they launched a global effort to secure all vulnerable nuclear materials around the world in four years. This ambitious goal was written into the summit's communiqué alongside a number of related pledges that support compliance with the existing nuclear materials security regime. The communiqué was accompanied by a more detailed work plan that provides guidance on the implementation of the political commitments made at the summit.

#### Measurable Progress

While these consensus documents were important for demonstrating broad support for nuclear terrorism prevention as a global issue-rather than a paranoid US obsession-the commitments they contain are nonbinding and heavily caveated. The interpretive wiggle room that countries left for themselves makes it difficult to Security Sumitry. President Barack Obama talks with President Nursultan Nazarbayev of Kazakhstan, center, and President Dmitry Medvedev of Russia at the April 2010 Nuclear Security Summit, a first-of-its-kind gathering of 47 world leaders where commitments were made to better secure weapons-usable nuclear material around the world. (White House photo by Pete Souza)

track the degree to which communiqué and work plan commitments have been fulfilled, especially when relying solely on open sources. However, many countries also made national commitments to take specific measures to improve nuclear security. Efforts to fulfill these national commitments represent some of the most farreaching and concrete results of the 2010 summit.

Approximately 60 percent of the national commitments made in Washington have been completed with notable progress made on an additional 30 percent. Important examples include: Chile removing all HEU from the country, Kazakhstan eliminating 33 kilograms of HEU, and Russia ending its production of plutonium. A number of countries ratified the foundational international conventions governing nuclear material security, joined international initiatives, and committed millions of dollars to support the International Atomic Energy Agency's Nuclear Security Fund and other targeted projects to convert HEU reactors, prevent smuggling, and secure materials.

## New Concerns Arise

The 2012 Seoul summit is expected to maintain a primary focus on nuclear material security. In particular, countries will report on progress implementing their 2010 commitments, assess progress toward the fouryear goal, and issue a second communiqué. Countries are also being urged to again make national commitments at the summit. However, the summit's scope is expected to slightly expand into the related realm of nuclear safety.

The Seoul summit will take place approximately one year after an earthquake and tsunami caused a devastating accident at the Fukushima Daiichi nuclear power plant in Japan that exposed the local population to radiation. There are other international forums directly addressing the nuclear safety lessons and implications of Fukushima, but leaders at the 2012 NSS are expected to rightly draw attention to the intersection of nuclear safety and security. Nuclear safety differs from nuclear security in that it seeks to prevent accidental, rather than intentional, releases of radioactive material. Successfully integrating and implementing robust nuclear safety and security measures is an important aspect of protecting citizens and rebuilding public confidence in our ability to manage nuclear power's risks.

The 2012 summit may also increase its focus on securing radiological materials. The 2010 NSS referred to states'

responsibilities to secure radioactive sources, but it purposely did not go into much detail in order to preserve the summit's focus on nuclear materials. However, radiological materials are located in nearly every country around the world and used for medical, commercial, and industrial purposes. Most sources are low intensity and not suitable for a terrorist weapon, but high-intensity radiological sources like cesium-137, americium-241, and cobalt-60 could be fashioned into "dirty bombs" that disperse radiation. While few neighborhoods are home to nuclear power plants and research reactors using HEU and plutonium, many around the world include hospitals where highintensity radioactive sources are used for lifesaving treatments and therapies. This reality localizes the potential threat of radiological terrorism for global citizens.

## Engaging Industry, Civil Society

In addition to government officials heading to Seoul, the heads of nuclear power companies and experts from the nongovernmental and academic communities will also attend their own summits on nuclear security. Similar side-summits took place in Washington in 2010. These events demonstrate that responsibility for nuclear material security extends beyond governments into private industry and civil society.

While "strengthening the global nuclear material security regime" is not something that makes it on to most people's daily "to do lists," the global community has a major stake in its continual development and adaptation. In addition to avoiding the dramatic economic, political, and human consequences of nuclear terrorism, the future of nuclear power relies on robust safety and security measures to mitigate radiation risks. Today, 433 nuclear reactors generate 367 gigawatts (GW) of electricity, and the International Atomic Energy Agency projects an additional 90 reactors or more will come online by 2030 for a total of 501 GW. This low-carbon energy source is needed to help countries meet projected energy demand increases to fuel economic growth and raise standards of living, particularly in Asia.

Though the future of the NSS process beyond Seoul is not entirely clear, it would be a major loss if terminated prematurely. A nuclear terrorist incident would impact all aspects of the global economy. The NSS process has succeeded in focusing top-level attention on this issue, and its continuation holds the potential for advancing the nuclear material security regime on an unprecedented scale. Leaders, therefore, should continue to shine the spotlight on the value of nuclear terrorism prevention in protecting the global community.

> —Michelle Cann Research Analyst at the Partnership for Global Security

## www.stanleyfoundation.org

Nuclear and WMD Security and Summit Diplomacy-Leveraging Top-Level Engagement



# A "Whole of Society" Approach

## Experts Look to the Past for New Success

ur world has been revolutionized by globalization. The volume and speed of global trade has reached unprecedented levels. Globalization has led to the transfer of more technologies into more hands in more countries and regions of the world than in any other point in human history.

There are many reasons to celebrate these trends and many reasons to be cautious. For security specialists, particularly those focused on controlling the materials needed for weapons of mass destruction (WMD), globalization provides a whole host of new challenges.

Globalization means the materials and technologies associated with nuclear, biological, radiological, and chemical WMD can now move easily into the weak and fragile states that provide safe haven to terrorists. Enhanced world trade also means new private sector actors have the ability to directly (or even accidently) facilitate proliferation. More than ever, the fight to contain WMD is complex and constantly evolving.

The good news is the United States has a long and successful history of implementing all kinds of nonproliferation work. And there are significant international tools including resolutions of the UN Security Council and the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction to help strengthen global nonproliferation efforts.

There is, however, still much to be learned. Back when the Soviet Union collapsed there was a sense of urgency about controlling WMD materials in the post-Soviet states so they didn't fall into the wrong hands. The United States engaged in innovative and urgent responses to this very clear and present threat. The people charged with implementing the plan were given broad leeway to be creative in achieving their goals.

## Post-Cold War Lessons

A lesson learned in that period of early nonproliferation success was how important it is to get the host country to cooperate and accept the importance of the nonproliferation mission. Today's efforts still need this kind of host country buy-in, but achieving it isn't easy. The trick is getting states to understand how progress on nonproliferation can also help them meet some of their own security and development goals.

A recent Stanley Foundation conference brought together experts and policymakers to talk about how we can use nonproliferation assistance and other foreign aid to meet ◀ Securing the Globe. Globalization has created a vast network of trade and communication that makes it easier than ever to distribute technologies and share information. That also makes it more difficult to prevent proliferation of dangerous materials such as chemical and nuclear materials. Engaging all aspects of society—from government, law enforcement, industry, and more—is necessary to prevent proliferation. (Wikipedia photo by Garitzko)

▶ Involving Industry. Medical personnel at K Hospital in Hanoi, Vietnam show a radiation cancer treatment procedure using a linear accelerator. Bringing a "whole of society" approach to stem proliferation will require involvement not only of governments but private technology makers, the medical profession, and more. (IAEA photo)

American security objectives while also helping host countries build their own capacity—an approach often referred to as "whole of government" or even "whole of society."

In a nutshell, these approaches have developed countries' funding projects, such as improving port and border security or the building of sophisticated medical labs, which have a direct benefit to nonproliferation but which also add needed value to the developing country being served.

Following the Cold War, the countries of the former Soviet Union were very interested in nonproliferation strategies. For the most part, they welcomed help in locking down or getting rid of WMD items. But today's new partners are less likely to prioritize nonproliferation, particularly in the face of other more immediate challenges to their economic development and human security.

Initiatives must be made relevant to the priorities of these countries. They must address real needs on the ground.

## Widen the Circle

At the conference the group came up with some important recommendations to strengthen this approach. The first was that US government coordination on nonproliferation should go beyond the typical circle of the US State, Defense, and Energy departments to also include the US Agency for International Development, the departments of Agriculture and Homeland security, the Centers for Disease Control and Prevention, the Nuclear Regulatory Commission, the National Academy of Sciences, the National Defense University, the FBI, and others.

Of course, these "whole of society" approaches to nonproliferation cannot be done by the United States alone. Partnerships should also be forged with a number of international, regional, and even local groups. These include the World Customs Organization, the World Trade Organization, the International Atomic Energy Agency, Interpol, regional and subregional organizations, and others.



To make this truly a "whole of society" effort, private interests must be incorporated, particularly those that can either directly or indirectly facilitate proliferation including private technology innovators, manufacturers, shipping companies, finance and insurance interests, and more. Nongovernmental actors should also be involved.

Another recommendation involves creating a global catalog or map of all international assistance programs not only the ones dealing with nonproliferation but also in the interconnected areas of those trying to stop the trafficking of small arms, drugs, humans, and counterfeit intellectual property. All of these threads could be brought together for a more broad-based—and, therefore, more effective—international effort to stop the proliferation of WMD materials.

Finally, conference participants said we need to better sell this "whole of society" approach as well as past accomplishments to those on Capitol Hill and in the broader public. US nonproliferation programs are perhaps the most successful US foreign policy initiatives of a generation. Now the need is to better highlight the remarkable value these initiatives can give to local conditions, US national security, and ultimately global stability.

> —Keith Porter Director of Policy and Outreach, The Stanley Foundation

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## Now Showing: Radioactive Challenge

This event-in-a-box toolkit examines the challenge of securing all vulnerable nuclear materials globally. It aims to encourage discussion of the complexities of the "world's greatest security challenge," keeping nuclear material out of the hands of terrorists.

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## NUCLEAR MATERIAL SECURITY

Nuclear and WMD Security and Summit Diplomacy-Leveraging Top-Level Engagement As governments gear up for the second Nuclear Security Summit (NSS) in Seoul, the Stanley Foundation convened a group of experts and officials at its 52nd annual Strategy for Peace Conference to assess achievements made thus far as well as the work that remains. Engagement from the highest levels of government has been instrumental in spurring action, but there are important questions about whether there should be additional summits or if there are ways to reconfigure international nuclear security efforts. November 2011 policy dialogue brief.

## Planning for Success at the 2012 Seoul Nuclear Security Summit

The 2010 Washington Nuclear Security Summit offers both procedural and substantive lessons for making the most of the follow-on meeting scheduled for Seoul in 2012. William Tobey, senior fellow at Harvard's Belfer Center for Science and International Affairs, offers specific suggestions for how to improve the chances for effective action resulting from next year's summit. June 2011 policy analysis brief.

## 1540 in Practice: Challenges and Opportunities for Southeast Asia

This brief by Togzhan Kassenova, a senior research associate at the University of Georgia's Center for

International Trade and Security (CITS), explores the challenges and opportunities to implementing robust proliferation controls in Southeast Asia and discusses broader development and security benefits that implementation of United Nations Security Council Resolution 1540 can bring to the region. May 2011 policy analysis brief.

## Next Generation Nuclear Security:

Measuring Progress and Charting the Way Forward On the one-year anniversary of the Nuclear Security Summit panelists and participants discussed progress on meeting the commitments made at the 2010 summit, Eurasian regional nuclear security efforts, education and training in nuclear security, and the role the International Atomic Energy Agency is playing in advancing nuclear security. April 2011 conference report.

## **GLOBAL LEADERSHIP**

#### Beyond Blocs: The West, Rising Powers, and Interest-Based International Cooperation

Do the West and the Rest share interests? Much hinges on the question of interests and whether states will be able to manage our globalized world, or instead preside over the costly erosion of a liberal international order that has served as the foundation of the last six decades of economic growth and the avoidance of war between great powers. New York University's Bruce Jones finds there is still room to forge a more peaceful and prosperous international order. October 2011 policy analysis brief.

## PREVENTING GENOCIDE

## The Responsibility to Protect: Challenges and Opportunities in Light of the Libyan Intervention

With contributions from many of the world's most respected R2P experts and practitioners, this compendium of pieces from e-IR attempts to draw attention to the major points of contention that have been highlighted by the Libyan intervention.

Stanley Foundation program officer Rachel Gerber has authored one of the pieces, "Prevention: Core to the Responsiblity to Protect." November 2011 online collection.



The phrase *never again* has been used for decades as a symbol of international resolve to never allow an abomination like the Holocaust to happen again. That resolve has been tested many times, and too often it has failed.

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# Nuclear Security Group Launches New Web Site, Media Resources



heck out *www.fmwg.org*, the new Web site for the Fissile Materials Working Group (FMWG), a nongovernmental coalition of more than 60 US and international organizations working to provide action-oriented policy solutions to keep the world safe from nuclear terrorism.

The site includes interactive features, video, a wealth of resources and information on how citizens can take action to help secure nuclear material. Learn more about the international threat that President Obama has called the "most immediate and extreme threat to global security," and find out what actions are being taken to ensure that nuclear material remains protected and accounted for.

