

VISION AND ACTION FOR A SAFER WORLD



NUCLEAR THREAT INITIATIVE ANNUAL REPORT 2007

About the cover:

Nuclear technology embodies both promise and peril. The same technology used to enrich uranium for medical or energy purposes can also be used to enrich uranium for nuclear weapons.

The images on the front and back cover represent both the challenges of nuclear technology and successful progress in reducing nuclear dangers.

The front cover shows a nuclear research reactor that was converted from using highly enriched uranium, which can also be used to make a bomb, to using low-enriched uranium, which cannot. The image that begins on the front and continues on the back is an array of nuclear centrifuges used to enrich uranium.

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LETTER FROM THE CO-CHAIRMEN

In October of 2001, top U.S. government officials received a highly classified intelligence report, warning that terrorists had acquired a 10-kiloton nuclear bomb and planned to smuggle it into New York City, where it could—if detonated—destroy much of lower Manhattan and kill hundreds of thousands of people.

This intelligence report was later judged to be false. But it was never judged to be implausible.

In November of 2007, four armed men broke into a nuclear facility in South Africa that housed enough weapons-usable uranium to build 25 nuclear bombs. The intruders deactivated key elements of the security system, then broke into the emergency control center. When an off-duty security officer triggered an alarm, the four men fled.

Significant unanswered questions remain about this incident, but it tells us that the threats from nuclear weapons and materials remain real and credible.

In August 2007, six American cruise missiles armed with nuclear warheads were unknowingly and mistakenly loaded from storage and put onto an Air Force plane. The weapons were flown across the country and unloaded, and for 36 hours, no one knew where the warheads were or even that they were missing from storage.

This was the kind of mistake that most military experts had said never could happen, but it did.

For decades, the United States saw the Soviet Union as the center of the nuclear threat, and the Soviet Union saw the same threat from the United States. Today, no matter what your political perspective, the nuclear threat cannot be contained in any particular country

or region. The nuclear threat is global and resides anywhere there are nuclear weapons or the capacity to make them.

The materials needed to build nuclear weapons can be found today in approximately 40 countries. More than a dozen countries already have the ability to produce this material on their own. As demand for nuclear power grows with rising energy needs and concerns over climate change, more countries are seeking to develop nuclear power. These countries may legitimately want fuel for their nuclear reactors. But enriching uranium to run a nuclear reactor is the same process as enriching uranium to build a nuclear weapon.

In a world where there are many more nuclear players—some animated by regional conflicts, religious hatred and stoked by extremist elements—the chances of making it through another generation without a nuclear attack will be diminished. Deterrence—the strategy that helped us get through the Cold War without a nuclear attack—is far less likely to prevent a nuclear explosion in a world where there are more nations with nuclear weapons, more nations seeking nuclear weapons and more terrorists who have no return address and likely cannot be deterred.

The spread of nuclear weapons and nuclear know-how to more nations directly increases the threat of such an attack by terrorists. It's simple mathematics. The more nations and facilities that have nuclear weapons or materials, the more likely it is that terrorists can penetrate a facility and acquire a nuclear weapon or the materials they need to build one.

It increasingly appears that nuclear weapons, which were created to enhance our security in another age, increasingly imperil our security in this age. We need to change direction, galvanizing global action to reduce nuclear dangers and build support for reducing reliance on

nuclear weapons, avoiding their spread and ultimately ending them as a threat to the world.

This view was expressed this year in *The Wall Street Journal* in an opinion piece written by former Secretary of State George Shultz, former Secretary of Defense William Perry, former Secretary of State Henry Kissinger, and former Senate Armed Services Chairman and NTI Co-Chairman Sam Nunn.

The op-ed argued that global leadership would be required and urged the leaders of countries with nuclear weapons to work intensively to turn the goal of a world without nuclear weapons into a joint enterprise. It then outlined ten concrete steps for reducing nuclear dangers.

According to *The New York Times*, the opinion piece “sent waves through the foreign-policy establishment.” A surge of support among experts of wide-ranging backgrounds immediately followed: from commentators, to advisors to Republican and Democratic Presidents, to a former Chairman of the Joint Chiefs of Staff, to prominent leaders of President Reagan’s arms control negotiation teams. The vision and action concept now has the support of more than two-thirds (a supermajority) of the living former Secretaries of Defense, State and National Security Advisors, the explicit support of a number of governments and the embrace of a growing number of international security leaders.

This opinion piece led to the creation of the Nuclear Security Project. The Nuclear Security Project is guided by the four authors, with NTI coordinating the work and managing the implementation of the Project in cooperation with the Hoover Institution.

The Nuclear Security Project is designed to galvanize governments to rethink their policies, to change direction, and to take the steps that will reduce the risk of a nuclear weapon being used. We will pursue these goals with direct outreach to governments and to the key people

**IN SEVEN YEARS,
WE HAVE PROVED THAT
THERE ARE MANY PATHS
TO PERSUASION.**

who help shape the thinking and action of governments—security experts, academic leaders, business leaders, the media and interested citizens.

The steps outlined in the Project—especially efforts to change Cold War nuclear postures, reduce nuclear forces, lock down weapons and materials, and limit the spread of uranium enrichment facilities—are all areas where NTI has already been working diligently through our direct action projects. We now have a large number of leaders in the U.S. and around the world expressly supporting the agenda we have been pursuing.

As NTI works in the coming months to influence the vision of governments around the world, we will continue and accelerate the direct action projects that have made us a distinctive force in reducing threats from weapons of mass destruction:

Global Cleanout: In 2002, NTI played a key role in removing 2½ bombs' worth of highly enriched uranium from a nuclear reactor outside Belgrade. Later, we led an international effort to permanently remove and eliminate up to two dozen nuclear bombs' worth of material from a nuclear power reactor in Aktau, Kazakhstan. We will soon start an additional project in Kazakhstan at the Alatau research reactor. With the timely and generous support of gifts from Peter G. Peterson and Warren Buffett, we will also work in Russia to help develop a blueprint for action for reducing nuclear dangers associated with Russian research reactors. We will continue to seek targeted opportunities to help specific facilities secure or eliminate nuclear materials, including possible projects to remove weapons-usable nuclear material from sites in Africa and Europe.

Nuclear Fuel Reserve: In the fall of 2006, NTI announced that we were prepared to contribute \$50 million to help create a low enriched uranium stockpile owned and managed by the International Atomic Energy Agency. This commitment, backed by NTI advisor Warren Buffett, could help guarantee a “last resort” fuel reserve for nations that do not have the capacity to enrich uranium and would accept a guaranteed international supply of nuclear fuel as a cheaper and safer

alternative to building the capacity to make it. In late 2007, the U.S. government appropriated \$50 million to the fuel bank concept, and the government of Norway has pledged an additional \$5 million and committed to help raise the remaining \$45 million. We also believe that our proposal has helped catalyze other fuel assurance concepts which potentially can create layered assurances to help avoid a proliferation of enrichment capacities.

WINS: NTI is working to launch a new global initiative to strengthen security for nuclear materials around the world—the World Institute for Nuclear Security (WINS). WINS is the best hope for rapidly increasing security at nuclear facilities and fills dangerous gaps in existing government and international regulatory efforts. WINS will bring together practitioners—the professionals responsible for on-the-ground security practices—to collect the world's best practices in nuclear materials security and to share that information with facilities that are responsible for protecting the world's most dangerous nuclear materials and prevent these materials from getting into dangerous hands. The people involved in WINS are on the front lines, and they are in the best position to know where the vulnerabilities are, how to improve security for nuclear materials and to see that security improvements are implemented quickly and effectively. The WINS concept is building broad international support from nuclear security experts, the nuclear industry, government officials and international organizations. WINS' initial focus will be on security for the most dangerous materials—plutonium, mixed oxide fuel and highly enriched uranium.

Fighting Bioterrorism: NTI's Global Health and Security Initiative (GHSI) is working around the world to improve the global capacity to prevent and respond to biological threats. Our focus is on preventing bioterrorism, but the essential elements of an effective response are the same whether a disease is naturally occurring or intentionally caused: (1) detect the outbreak, (2) diagnose the disease, and (3) take effective measures to contain it. NTI has helped build two regional disease surveillance networks in challenging regions of the world—the

Middle East, where the network includes Israel, the Palestinian Authority and Jordan, and Southeast Asia, where the network includes Thailand, China, Laos, Myanmar, Vietnam and Cambodia. We are currently launching a third network in South Asia that will include Pakistan, India, Bangladesh and Sri Lanka. These collaborations have the added value of building trust and confidence in areas of high endemic disease, with limited resources. These are also politically volatile parts of the world. We also plan to connect these networks, and others, to share best practices and technical developments that will make us all safer from the threat of infectious disease.

NTI has also helped to establish the International Council for the Life Sciences (ICLS)—a non-profit organization that aims to enhance global biological security and safety by establishing international standards and sharing best practices. The ICLS brings together experts from around the world in the public and private sectors of the life science community to identify critical biological risks to public safety and security, and to help ensure that the extraordinary advances in biotechnology over the past decade that are bringing great benefits to society are not misused to cause harm. As it builds its global presence, the ICLS set up an International Advisory Group on biosafety and biosecurity in partnership with the I.M. Sechenov Moscow Medical Academy. The Advisory Group includes experts from the leading life science institutions in Russia and Central Asia. They meet regularly, and pursue cooperative projects, with counterparts from the U.S., Japan, UK and other European countries to counter, in common cause, biological threats. With partners in the United Arab Emirates (UAE), the ICLS has initiated a project to develop a regional biosafety and biosecurity strategy for the Gulf, Middle East and North Africa, including the setting up of regional training centers in Jordan and the UAE.

GHSI and ICLS are now working in partnership and together are becoming an increasingly influential force in the global effort to make us safer from infectious disease threats whether their origin is natural or deliberate.

When we launched NTI seven years ago, we knew that our goal of reducing the threat from weapons of mass destruction was audacious. We were working in an area, after all, in which the levers of power are in the hands of government, and policy is often cloaked in secrecy and not prone to change.

Since we knew that governments alone have the resources and authority for the large-scale work of threat reduction, we recognized that our success hinged not just on what we could do, but on what we could persuade governments to do.

In seven years, we have proved that there are many paths to persuasion. It can come through the success of smaller direct action projects, which we then prevail on governments to replicate and expand. It can come from hearing the views of experts. It can also come through the force of public opinion. That's why we are calling on individuals to get involved—because individuals, by helping to fund this work and publicize it, can advance and support all three angles of persuasion.

In the past, when citizens and activists learned about the threats from weapons of mass destruction, they were concerned—but many didn't believe they could have an impact, so they tuned out and moved on. Today, those who are worried about weapons threats have a place to go and a partner to support if they want to work for a safer tomorrow.

Log on to saferworld.org. Join the Safer World Action Network. Become part of our movement. You can help prove that private citizens don't have to be spectators in matters that affect our future.

Ted Turner
Co-Chairman

Sam Nunn
Co-Chairman





ABOUT NTI

The Nuclear Threat Initiative is a nonprofit organization working to reduce the global threats from nuclear, biological and chemical weapons. Nonpartisan and non-ideological, NTI is a place where people with different views from all parts of the world work together to develop and implement a carefully thought out, well-organized global response to dangers that affect all of humanity. NTI is a global initiative with offices in Washington, D.C. and Moscow. Its activities are conducted so as to be fully transparent to the U.S. and other governments.

Co-chaired by philanthropist and CNN founder Ted Turner and former U.S. Senator Sam Nunn, NTI is governed by an expert and influential Board of Directors with members from the United States, Japan, India, Pakistan, China, Jordan, Sweden, France, Russia and the United Kingdom. Board members include a former U.S. Secretary of Defense, members of the legislative bodies of the United States, France and the United Kingdom, a member of the Jordanian royal family, a Nobel prize-winning economist, a world-renowned nuclear

NTI'S MISSION IS TO STRENGTHEN GLOBAL SECURITY BY REDUCING THE RISK OF USE AND PREVENTING THE SPREAD OF NUCLEAR, BIOLOGICAL AND CHEMICAL WEAPONS AND TO WORK TO BUILD THE TRUST, TRANSPARENCY AND SECURITY WHICH ARE PRECONDITIONS TO THE ULTIMATE FULFILLMENT OF THE NON-PROLIFERATION TREATY'S GOALS AND AMBITIONS.

IAEA inspectors visiting the Vinca nuclear research reactor to inspect the spent fuel. In 2002, NTI gave \$5 million to help catalyze the removal of highly enriched uranium to a more secure location.

NTI'S FOCUS IS ON **LEVERAGE**— COMBINING ITS INFLUENTIAL VOICE WITH DIRECT ACTION PROJECTS TO CATALYZE GREATER, MORE EFFECTIVE ACTION BY GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS.

physicist, the former commander of U.S. strategic nuclear forces and other international security experts. The foundation's activities are directed by NTI Co-Chairman Sam Nunn and NTI President Charles B. Curtis.

Advisors to the Board of Directors include leading figures in science, business and international security. NTI is staffed by experts in nonproliferation, international affairs, communications, public health and medicine who have operational and international experience in their fields.

Recognizing that governments have most of the resources and authority in the large-scale work of threat reduction, NTI focuses on leverage—combining its influential voice with direct action projects to catalyze greater, more effective action by governments and international organizations.

While NTI's basic goals are clear and certain, the organization's activities evolve as the nature of the threats change and as new ideas emerge on how best to combat the threat of weapons of mass destruction. NTI as an organization continues to learn and improve.

REDUCING NUCLEAR DANGERS

NTI realizes that the danger of nuclear weapons use is multi-faceted and must be combated in complementary and coordinated ways. NTI's objectives in this arena include improving the security of highly enriched uranium stockpiles, discouraging states from establishing their own nuclear fuel cycles and creating alternative employment for displaced nuclear industry personnel in Russia and the New Independent States.

Redirecting Russian Nuclear Expertise

As Russia cuts the size of its nuclear weapons complex, thousands of jobs are being eliminated. To reduce the risk that nuclear scientists and engineers may use their skills in ways that promote proliferation or even terrorism, NTI is working with Russian authorities and enterprises to redirect key personnel toward employment in the non-weapons, civilian economy. A promising pilot project in Sarov has established a revolving loan fund, a contract research organization and a "technopark" to foster alternative employment opportunities.

Nuclear Fuel Bank

To help prevent the spread of uranium enrichment technology to countries around the world, NTI has pledged \$50 million, backed by Warren Buffett, to the International Atomic Energy Agency (IAEA) to help create a low-enriched uranium stockpile. NTI's funds will be released if the IAEA takes the necessary steps to set up the fuel bank and other nations provide \$100 million in matching funds. In December 2007, the U.S. Congress approved \$50 million toward this effort, giving the project a substantial boost, and in March 2008 Norway pledged \$5 million.

World Institute for Nuclear Security (WINS)

NTI is working with the Institute of Nuclear Materials Management to establish a new international organization of nuclear facilities operators. Its principal goal: to disseminate best practices so that nuclear materials are kept secure and out of the hands of terrorists. The new organization, which will be named the World Institute for Nuclear Security, will encourage practitioners to share information on best practices that can be widely replicated, especially concerning potentially dangerous nuclear materials such as HEU. A coordinating committee is seeking support from governmental and private entities to make WINS operational in 2008.

Global Cleanout and Secure

Highly enriched uranium (HEU) can be found in 40 countries around the world. NTI is working to leverage greater action by governments to secure and remove HEU and help reduce the use of HEU in commerce.

- 8 **Securing and Eliminating Nuclear Weapons Materials:** NTI worked with the governments of Serbia, the United States and Russia to remove poorly secured HEU from the Vinca nuclear reactor outside of Belgrade. The successful NTI action helped spur the creation of a \$450 million U.S. Global Threat Reduction Initiative, aimed at removing and/or securing high-risk nuclear materials and sites around the world. That program has helped transfer nuclear materials from Poland, Vietnam, Germany and the Czech Republic, among others, to safer storage or elimination in Russia.
- 8 **Eliminating Nuclear Weapons Materials in Kazakhstan:** NTI and the government of Kazakhstan eliminated more than a dozen bombs' worth of HEU in Kazakhstan, leading to a decision by Kazakhstan's president to eliminate all HEU in the country. NTI is now helping convert a reactor that uses HEU to run on low-enriched uranium.



Will Tobey, Deputy Administrator for Defense Nuclear Nonproliferation at the National Nuclear Security Administration of the U.S. Department of Energy, listens to comments from participants in a two-day meeting hosted by NTI in September 2007 to discuss WINS organizational and governance issues.

- 8 **Accelerating Reductions of Russian Stocks of HEU:** Working with Russian experts, NTI is preparing options for accelerating the blend-down of HEU.

Reducing Risks of Highly Enriched Uranium in Russian Research Reactors—A Blueprint for Action:

Roughly half of all of the research reactors in the world that use weapons-usable highly enriched uranium (HEU) are in Russia. Working with Russian and U.S. experts, NTI is creating a blueprint for action on the basis of a facility-by-facility survey to consider security requirements, HEU removal, spent fuel management and reactor conversion opportunities in Russia. This project will develop and provide the information that could be the basis for a Russian decision about converting or eliminating these facilities and could serve as a catalyst for Russia to develop an HEU minimization policy.

REDUCING BIOLOGICAL DANGERS

NTI's Global Health and Security Initiative (GHSI) addresses the full range of biological threats, whether those stem from natural pandemics, accidental outbreaks from laboratories or the use of biological agents as weapons. GHSI seeks to improve disease detection and response and to promote safe practices in biomedical science to secure dangerous pathogens and prevent the misuse of biotechnology information.

Promoting Safe Science:

The International Council for Life Sciences (ICLS), an independent, nonprofit, member organization launched by NTI, is working with governments and the biosafety community to improve biosafety and biosecurity standards. With an initial focus on the former Soviet Union, its work has expanded to cover the Middle East and North Africa. ICLS provides a forum to regularly engage the life science community and governments to identify critical biological risks to public safety, and to develop and promote global best practices, standards and training curricula for biosecurity and biosafety.

Developing Regional Disease Surveillance Networks:

GHSI is working in some of the most complicated regions of the world to develop regional disease surveillance networks that can be the building blocks for a global system.

- 8 **MECIDS:** NTI has supported the development of an infectious disease surveillance system in the Middle East among Israel, Jordan and the Palestinian Authority. The partnership was up and running in the region when the first outbreak of bird flu was detected. MECIDS

enabled rapid communication and coordination of efforts to contain the spread of the disease. The partnership has continued to function and grow, despite political tensions in the area.

- 8 Southeast Asia: In March 2007, GHSI supported a six-country bird flu exercise using techniques similar to those in modern war gaming, involving officials and health experts from Cambodia, China, Laos, Myanmar, Thailand and Vietnam. GHSI is working to expand and build out this multilateral partnership, known as the Mekong Basin Disease Surveillance Network.

ELIMINATING CHEMICAL WEAPONS

NTI is helping with the destruction of chemical weapons in Russia, by joining with the government of Canada to build an 11-mile railway to safely and securely transport the weapons to a modern destruction facility at Shchuch'ye.

RAISING PUBLIC AWARENESS

Raising public awareness is a key part of NTI's mission. NTI, *The Washington Post*, and the Belfer Center on Science and International Affairs at Harvard University, released the 2007 edition of *Securing the Bomb*—including publication of an op-ed and graphic depicting progress toward securing nuclear stockpiles and interactive features on the washingtonpost.com website. This annual report on the state of the nuclear threat continues to be the best single source of information about the U.S. and other governments' efforts to keep nuclear weapons and materials out of terrorist hands and how to accelerate that work.

In partnership with Families of September 11, NTI worked to highlight the risk of nuclear terrorism and encourage individuals and groups to get personally involved in advocating accelerated efforts to secure nuclear weapons materials around the globe.

NTI offers comprehensive information on WMD issues 24/7, through its website, www.nti.org, which includes *Global Security Newswire*, a daily online news service and an online research library with extensive information useful to both experts and laypersons seeking information on nuclear, biological or chemical weapons and materials.



NUCLEAR

THE NATURE OF THE THREAT

Despite significant progress in cooperative efforts to secure nuclear weapons and materials, the risk of a nuclear weapon being used today is growing, not receding. Terrorists are seeking nuclear weapons and there can be little doubt that if they acquire a weapon that they will use it. Materials to create nuclear weapons exist in more than 40 countries, and some of this material is still secured by nothing more than a chain link fence. At the current pace, it will be several decades before this material is adequately secured or eliminated globally.

The number of nuclear weapons states has increased. Iran's nuclear program threatens to spark a nuclear arms race in the Middle East. Until North Korea meets its commitment to dismantle its nuclear weapons program, there is also the potential for a nuclear arms race in Asia.

Interest in nuclear energy is growing and a number of countries are considering developing the capacity to enrich uranium to use as fuel for nuclear energy. However, once any nation has the ability to enrich uranium for energy, they have the capacity to move quickly to a nuclear weapons program if they chose to do so. As of March 2008, nearly 50 countries have contacted the IAEA for help in establishing new nuclear energy programs.

In a world with more nuclear weapons states, the chances of making it through another generation without a nuclear explosion are much reduced. In addition, more countries and facilities with weapons and materials increases the opportunity for terrorists to acquire nuclear weapons or the materials to make one.

Meanwhile, the United States and Russia, which have the bulk of the world's nuclear weapons and materials, continue to deploy thousands of nuclear weapons on ballistic missiles that can hit their targets in less than 30 minutes—a short-warning time, prompt-launch capability that carries with it an increasingly unacceptable risk of an accidental, mistaken or unauthorized launch.

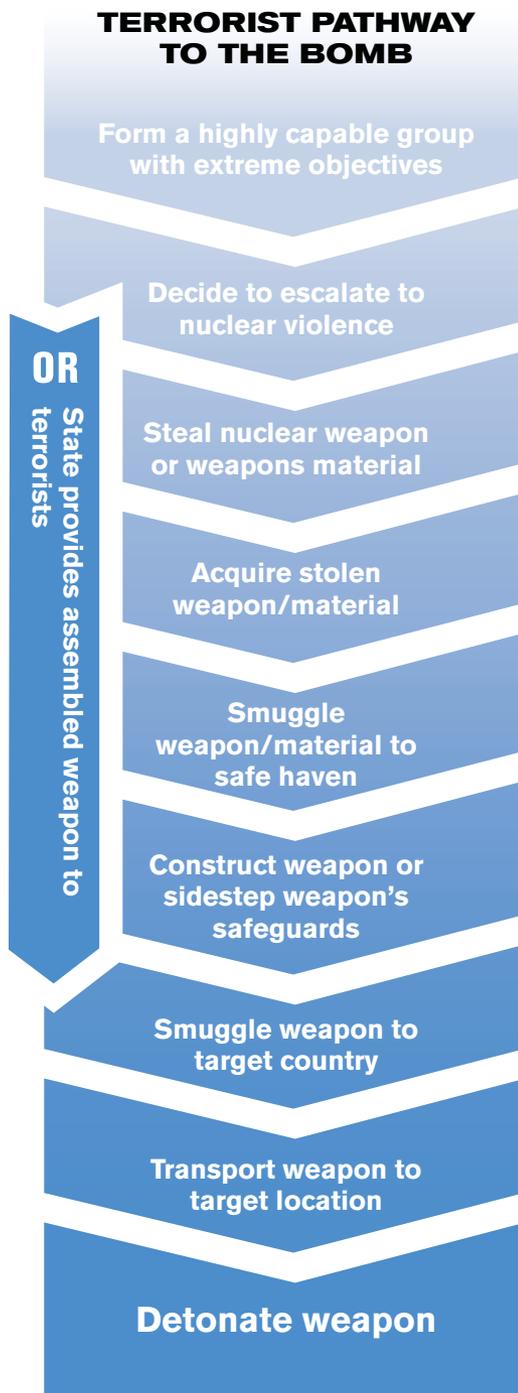
The bottom line: the accelerating spread of nuclear weapons, facilities, know-how and material has brought us to a nuclear tipping point. The world is heading in a very dangerous direction.

“WE ARE STILL NOT MOVING AS QUICKLY AS WE CAN OR WE MUST. THOSE IN THE FIELD DOING THE HARD WORK IN SECURITY AND SAFETY—WHETHER FROM RUSSIA OR AMERICA OR OTHER COUNTRIES—NEED AND DESERVE FOR THEIR LEADERS TO KNOCK DOWN ALL THE OBSTACLES THAT IMPEDE THEIR PROGRESS.”

NTI CO-CHAIRMAN SAM NUNN

The Vinca nuclear research reactor, where NTI acted to catalyze the removal of two and a half bombs' worth of HEU.

STRATEGIES FOR NUCLEAR THREAT REDUCTION



Reducing the risk of nuclear use by terrorists and nation-states requires a broad set of complementary strategies. The strategies should focus on reducing state reliance on nuclear weapons, stemming the demand for nuclear weapons and denying organizations or states access to essential nuclear materials, technologies and know-how. Global nuclear threat reduction requires cooperation among states, international organizations and non-state actors.

No state acting alone has sufficient authority or resources to be entirely certain that it has protected itself, especially from nuclear terrorism. If, however, the United States and Russia were to take steps to de-emphasize their reliance on nuclear weapons, both nations would gain greater standing to encourage other nations to forgo the nuclear option. This is not because their example will inspire Iran, North Korea or al-Qaeda to say “we have seen the light,” but because many more nations will be willing to join us in a firm and vigorous approach to stop the proliferation of nuclear weapons and materials and prevent catastrophic terrorism.

NTI is working on a number of key projects designed to address the most urgent near-term risks, and to take advantage of opportunities in which a nongovernmental organization can leverage greater action from governments. Some are described below.

SECURING, CONSOLIDATING AND REDUCING FISSILE MATERIAL

Producing nuclear explosive material remains the most difficult hurdle in making a nuclear weapon. Therefore control over nuclear materials is the first line of defense in preventing states or terrorist groups from obtaining nuclear weapons. A global approach to removing and securing vulnerable nuclear materials is essential, because the chain of security is only as strong as its weakest link, and vulnerable nuclear material anywhere is a threat to everyone, everywhere.

A necessary focus for reducing and consolidating fissile material is Russia, the home of roughly half the research reactors in the world that use weapons-usable HEU. The Russian government currently does not have a policy for minimizing the use of HEU in civilian facilities, and this severely constrains cooperative work in this vital area.

With support from Peter G. Peterson and Warren Buffett, NTI has initiated a project called “Reducing Risks of Highly Enriched Uranium in Russian Research Reactors—A Blueprint for Action” to help close this gap. The project will advance a facility-by-facility survey to examine

security requirements, opportunities for HEU removal, spent fuel management and reactor conversion opportunities. This information could be the basis for a Russian decision about converting or eliminating these facilities and could serve as a catalyst for Russia to minimize the use of HEU in civil applications.

Since September 11, 2001, in part thanks to NTI's effort to increase awareness of this problem, the U.S. government has put more emphasis on locating HEU stocks around the world and making sure they are as secure as possible. In many instances, the United States, Russia and the IAEA have worked together to return HEU to Russia from the non-Russian republics of the former Soviet Union as well as former Soviet allies.

For example, the United States funded, and together with the IAEA jointly monitored and executed, the repatriation of HEU from the Otwock research reactor facility in Poland in 2006 and 2007 to Russia's Luch Scientific Production Association for downblending. Other nuclear materials have been removed and repatriated from the Czech Republic, Germany and Vietnam, among others.

BUILDING GLOBAL COOPERATION ON SECURITY GOALS

With renewed interest in nuclear power, the inherent risks associated with certain dual-use fuel-cycle technologies must be managed to avoid the proliferation of dangerous fissile materials. To that end, NTI is leading an effort to create a nuclear fuel bank under the auspices of the International Atomic Energy Agency (see sidebar).

In another significant initiative designed to help secure nuclear materials and keep them out of the hands of terrorists, NTI in cooperation with the Institute for Nuclear Materials Management made important progress in 2007 toward the founding of a World Institute for Nuclear Security (WINS). WINS, whose main goal will be to share best practices on nuclear materials security internationally, is expected to begin operations in 2008 (see p.17).

LEVERAGING RESOURCES TO ADDRESS NUCLEAR INFRASTRUCTURE AND HUMAN CAPITAL

As part of restructuring its nuclear complex, Russia is reducing its nuclear weapons workforce and is closing or converting facilities at ten nuclear sites. Many of the people who hold these

HOW NOT TO FUEL PROLIFERATION

The 2006 Report on the UN High Level Panel on Threats said that "...the proliferation risks from the enrichment of uranium and from the reprocessing of spent fuel are great and increasing."

To help prevent the spread of uranium enrichment technology, NTI, with Warren Buffett's backing, has pledged \$50 million to the International Atomic Energy Agency (IAEA) to help create a low-enriched uranium stockpile to support nations that have made the sovereign choice to develop their nuclear energy based on foreign sources of fuel supply services—and therefore have no indigenous enrichment facilities. NTI's funds will be released if the IAEA takes the necessary steps to set up the fuel bank and other nations provide \$100 million in matching funds. In 2007, President Bush signed into law a \$50 million appropriation toward this effort, and in March 2008, Norway pledged \$5 million.

The idea for a fuel reserve is not new; there has been discussion of it, in some form, for several decades, and the International Atomic Energy Agency's statute provides for it. NTI's commitment is intended to help move the discussion from words to deeds in this vital area of nuclear cooperation.

jobs have access to nuclear weapons material or information that could prove useful to terrorists or rogue states seeking nuclear capabilities.

A transition to sustainable civilian employment is critical if workers in the nuclear complex are to avoid temptations to sell access or information before their jobs are lost. Reducing the total population of workers at all levels with access to sensitive materials, facilities or information requires an array of techniques beyond those currently in use.

Since it began in 2001, NTI has supported projects in Russian closed nuclear cities to help prevent the spread of nuclear knowledge. These projects are designed as models to be replicated elsewhere. Their goal is to strengthen nuclear security by re-employing personnel with knowledge of sophisticated weapons design and materials handling practices.

In Soviet times, Sarov was a closed nuclear industrial city, and today is in the midst of losing 4,000 jobs. To help the transition to civilian employment, NTI contributed \$1 million to a revolving loan fund, which in turn has funded 10 companies making a variety of products including ultra-light aircraft, precision equipment for the oil and gas industries, and medical equipment. More than 100 former weapons complex workers have found jobs in the civilian sectors, and the successful enterprises are repaying their loans, allowing the fund to make new loans.

NTI has also invested in SarovLabs, a contract research organization whose clients have included Hyundai, DaimlerChrysler and Russian oil companies. NTI's last project in Sarov entailed providing \$1 million to support Sarov's Open Technopark. The Technopark is located nearby, but outside the fence of the closed city, so that it is open to the public, including international visitors. NTI is partnering with the Russian company AFK Sistema to create an energy efficiency center in the Technopark that will research and build small, energy-efficient power sources.

NTI's experiences in Sarov can provide important lessons for future efforts to redirect nuclear weapons workers into peaceful, viable economic activities. To fully achieve their nonproliferation goals, programs to redirect employment must reach beyond nuclear scientists and include technicians, guards, drivers and any other employees with access to information about nuclear material production and facility operations. If new business enterprises are to succeed, additional investment and training in marketing techniques are required. In this regard, NTI helped SarovLabs hire a Russian, western-trained marketing expert, which led to a significant increase in SarovLabs' client base and revenue. Most important, however, is the desirability of providing alternative, civilian employment—permanently reducing the number of employees in the nuclear complex—rather than merely paying specialists a small maintenance salary to stay in place.



[top] Intel Corporation Building at the Sarov Open Technopark.

Officials speak at opening of Sarov Open Technopark.

THE WORLD INSTITUTE FOR NUCLEAR SECURITY

The World Institute for Nuclear Security will be a new international organization, developed by a unique partnership of NTI, the Institute of Nuclear Materials Management (INMM) and the U.S. Department of Energy, with the participation of the International Atomic Energy Agency (IAEA), to help strengthen security for nuclear materials around the world.

By spreading the best approaches to nuclear security, WINS will help address dangerous gaps in existing international approaches to nuclear security. Today, there are no binding international standards applicable within a state for how to secure nuclear material, and no requirement for international nuclear security inspections. IAEA safeguards inspections are aimed at detecting diversion of material by a state, not whether the material is secured against criminal or terrorist theft—and safeguards do not generally apply in nuclear weapons states.

WINS will be a voluntary organization that brings together the professionals responsible for on-the-ground security practices to collect the world's best practices in nuclear materials security and share that information with others responsible for protecting dangerous nuclear materials. The people

involved in WINS are in the best position to know how to improve security for nuclear materials and to see that security improvements are implemented quickly and effectively.

NTI began developing the framework for WINS in 2005 and the concept now has broad international support from nuclear security experts, the nuclear industry, government officials and international organizations. The WINS concept has been developed in close coordination with the IAEA and will work to complement and supplement the activities of the IAEA's Nuclear Security Program.

In October 2007, the Institute for Energy Technology in Norway hosted a meeting aimed at fostering an exchange of information on best practices in nuclear security and establishing a forum for operators of research reactors, in particular those managing highly enriched uranium. The workshop conclusions indicated that regularizing this kind of dialogue would be a contribution to the field of nuclear material security.

NTI'S work to establish WINS is being supported by gifts from Peter G. Peterson and Warren Buffett.

REVERSING RELIANCE ON NUCLEAR WEAPONS GLOBALLY

The Nuclear Security Project is helping build consensus for reversing reliance on nuclear weapons to prevent their spread and ultimately end them as a threat to the world. The project will close analytic gaps, raise public awareness and build momentum for action by leaders and experts in key countries (see page 38).

PROJECTS APPROVED OR ONGOING IN 2007 **NUCLEAR**

SECURING, CONSOLIDATING AND REDUCING FISSILE MATERIAL

Accelerating Russian HEU Blend-down, Phase II

To build on a previous project to analyze options for accelerating the elimination through blend-down of excess Russian highly enriched uranium. This allows for additional analysis to optimize the options, promote the accelerated blend-down concept in the United States, Russia and Europe, as well as prepare additional data necessary for Russian government decision-making. *Facilities and Institutes of Russian Ministry of Atomic Energy* Moscow, Russia and others Up to \$1,000,000 2005-2007

Removing HEU from Serbia

To contribute to the removal of poorly secured HEU from the Vinca Institute of Nuclear Sciences by supporting the decommissioning of its research reactor and management of remaining spent nuclear fuel. *International Atomic Energy Agency* Vienna, Austria Up to \$5,000,000 2002-2007

Supporting Conversion for Alatau Nuclear Research Reactor

To provide the equipment and incentives for the research reactor at the Institute of Nuclear Physics at Alatau to be converted to use low-enriched uranium fuel by providing a new reactor control and protection system that will improve reactor safety. *Institute for Nuclear Physics* Alatau, Kazakhstan Up to \$1,600,000

Developing Research Reactor Coalitions and Regional Centers of Excellence

To develop research reactor coalitions and regional centers of excellence in order to help secure underutilized research reactors, and incentivize reactor operators to convert from highly enriched uranium (HEU) fuel to low enriched uranium (LEU) fuel. *International Atomic Energy Agency* Vienna, Austria \$390,000 2007-2009

Strategic Master Plan for Russian Research Reactors

To build on a previous successful project to define, at an aggregate level, the challenges associated with the continued use of highly enriched uranium (HEU) fuel at research reactors and related facilities in Russia. This project will create a strategic master plan on the basis of a facility-by-facility survey to consider security requirements, HEU removal, spent fuel management and reactor conversion opportunities for civilian research reactors in Russia. The resulting recommendations will provide necessary input to a comprehensive approach to phasing out HEU use in Russian civilian research facilities. *Foundation for Atomic Energy in the 21st Century* Moscow, Russia Up to \$2,500,000 2006-2008

Developing Nuclear Security Guidelines

The IAEA has been working since 9/11 to strengthen its capacity to support better security of nuclear materials around the globe. This project enables the IAEA to draft, publish and disseminate, for the first time in its history, nuclear security guidelines or "standards" for all countries to use as a basis for securing their nuclear materials. Creation of these guidelines/standards will fill a critical gap in the IAEA's framework for strengthening global nuclear materials security. *International Atomic Energy Agency* Vienna, Austria \$100,000 2006-2007

Planning to Secure and Remove HEU from Soviet-Supplied Research Reactors to Improve Safety and Reduce Proliferation Risks

To evaluate security, safety, regulatory, transportation and cost issues associated with removing fresh and spent HEU fuel from 24 poorly secured research reactors in 17 countries and to develop a comprehensive plan to achieve it. *International Atomic Energy Agency* Vienna, Austria Up to \$260,000 2002-2007

LEVERAGING RESOURCES TO ADDRESS NUCLEAR INFRASTRUCTURE AND HUMAN CAPITAL

Development of Conversion Companies

To contribute \$1 million to the Fund for Development of Conversion Companies, an existing Russian revolving loan fund, established to create permanent, commercially viable civilian businesses in the closed nuclear city of Sarov and provide sustainable employment for former weapons personnel. *Fund for Development of Conversion Companies* Sarov, Russia Up to \$1,000,000 2002-2007

Building Capacity at SarovLabs

To assist SarovLabs in becoming a self sustaining, commercial contract research organization that employs former weapons scientists by providing project management and marketing support. *SarovLabs* Sarov, Russia Up to \$450,000 2003-2008

Strategic Planning for Snezhinsk

To engage local and institute leaders from the closed nuclear city of Snezhinsk in strategic planning to support two key missions of the city over the next five years: downsizing the nuclear weapons facility and staff and securing the remaining nuclear materials at the site. *The Eisenhower Institute* Washington, DC, USA Up to \$230,400 2003-2007

Development of Open Technopark

To support project and infrastructure development in the new Open Technopark, located just outside the closed nuclear city of Sarov and in an area that provides free access to non-Russian companies and investors but still within an easy commute for former weapons scientists and engineers from Sarov. This project will contribute to the creation of new jobs not related to nuclear weapons and accelerate the transition to a smaller, more stable and more secure Russian nuclear weapons complex. *Center for Technologies Transfer "Sistema-Sarov"* Sarov, Russia Up to \$1,000,000 2005-2009

BUILDING GLOBAL COOPERATION ON SECURITY GOALS

The World Institute for Nuclear Security: Developing a Concept for a New Entity to Collect and Promulgate Best Practices for Nuclear Material Security

To gather international input and develop a concept to create a new international organization that would improve nuclear material security worldwide through the collection and dissemination of best practices in physical protection and nuclear material control and accountancy.
Up to \$500,000
2005-2007

India, Pakistan and the Global Nonproliferation System

To convene a series of workshops in India and Pakistan that explore how the United States, India and Pakistan might strengthen their adherence to global nonproliferation norms and practices and build an international consensus around a new understanding of India's and Pakistan's relationships to the international nonproliferation system.
The Henry L. Stimson Center
Washington, DC, USA
\$325,000
2004-2007

Strengthening the Global Partnership

To develop a constituency among and beyond the Group of Eight (G8) leading industrial nations for nuclear, biological and chemical threat reduction programs through partnerships with 21 security organizations from 16 nations. This project promotes the effective and timely implementation of the G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction's commitment to devote \$20 billion to support nonproliferation projects, initially in Russia, over the next decade.
Center for Strategic and International Studies
Washington, DC, USA
Up to \$1,793,152
2005-2007

U.S.-Russian Nonproliferation Working Group

To establish U.S.-Russian working relationships to reinvigorate the U.S. - Russian consensus on nonproliferation objectives and approaches and to create and identify shared interests and cooperative strategies for preventing the spread of nuclear, biological and chemical weapons.
Belfer Center for Science and International Affairs
John F. Kennedy School of Government
Harvard University
Cambridge, MA, USA
Up to \$250,000
2005-2007

Concept Development Grant for Low Enriched Uranium (LEU) Fuel Reserve to be Owned and Managed by the International Atomic Energy Agency

To promote the creation of a low enriched uranium (LEU) fuel reserve, owned and managed by the International Atomic Energy Agency (IAEA), to limit the spread of fuel cycle technology. If the IAEA builds the necessary support for this concept, up to \$50 million will be put toward the initial establishment of such a reserve, to include the first three years of storage costs, the IAEA's management and oversight costs, and the purchase of the initial LEU deposit. An LEU fuel reserve that is buffered from politically motivated disruptions of nuclear fuel supply will add a unique tool to current national and international efforts to significantly reduce the need for new enrichment facilities.

NTI and others
Washington, DC, USA
Up to \$108,000
2006-2007

Promoting Multilateral Approaches to the Nuclear Fuel Cycle in Russia

To promote the NTI fuel bank initiative and related subjects, including the Russian Angarsk international enrichment center project, by initiating a discussion among Russian governmental and non-governmental experts and the media on the future of nuclear energy and the future role of international nuclear fuel cycle initiatives.

PIR Center for Policy Studies in Russia
Moscow, Russia
\$277,100
2007-2008

GENERATING NEW THINKING ON REDUCING NUCLEAR RISKS

Deemphasizing the Role of Nuclear Weapons

To produce a report with practical proposals for removing U.S. and Russian nuclear weapons from Cold War nuclear postures and a follow-on report that explores options for the creation of a new multilateral arms control regime.
School for International Security and World Politics at the Institute of U.S.A. and Canada Studies
Moscow, Russia
\$71,728
2004-2007

Promoting Responsible Nuclear Stewardship in India

To promote responsible government policies and practices related to the safety and security of nuclear weapons and materials in India by developing educational materials for policymakers and facilitating meetings among nuclear experts in India and other nations.

Delhi Policy Group
New Delhi, India
\$230,000
2003-2007

Cooperative Threat Reduction in East Asia

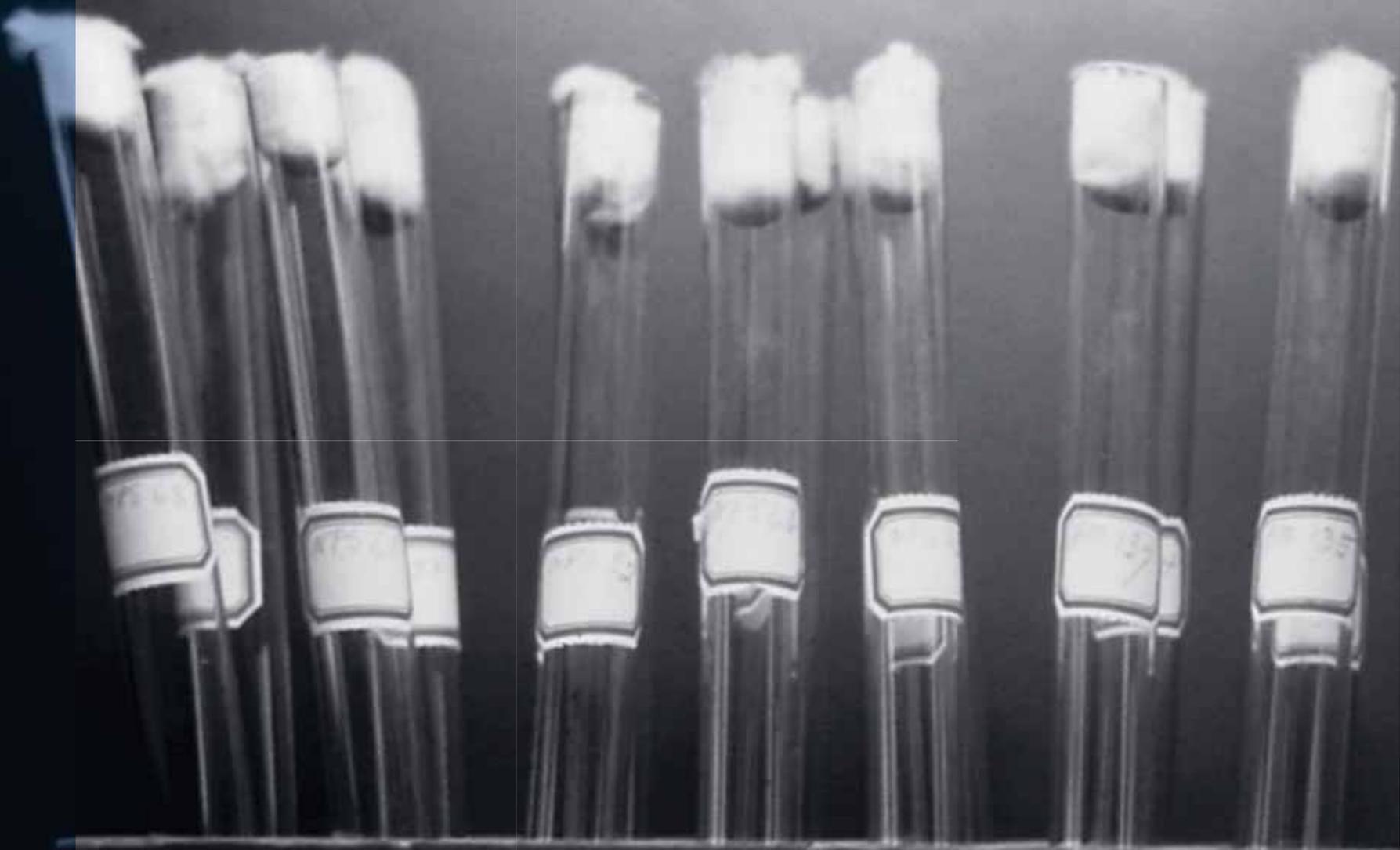
This project aims to build political support for cooperative threat reduction (CTR) on the Korean peninsula, promote contacts between national technical communities likely to be involved in such programs, provide support for developing specific CTR activities, and use regional expertise to adapt existing CTR approaches to the Korean peninsula.
Center for Strategic and International Studies
Washington, DC, USA
\$85,000
2006-2007

Carnegie International Nonproliferation Conference

To support the 2007 Carnegie International Nonproliferation Conference.
Carnegie Endowment for International Peace
Washington, DC
\$50,000
2007

Ballistic Missile Defense and Nuclear Stability in Asia

To assess the impact of ballistic missile defense on the strategic interactions and stability among India, Pakistan, China and Taiwan.
Center for International Security and Cooperation
Stanford University
Palo Alto, CA, USA
\$150,000
2005-2007



BIOLOGICAL

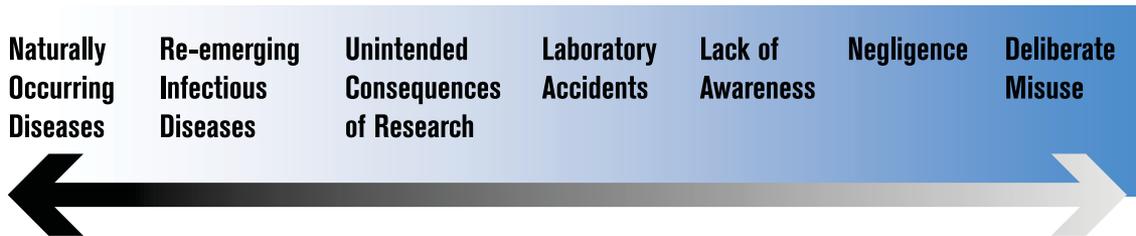
THE NATURE OF THE THREAT

Understanding and combating biological risks pose challenges that are encountered with no other conventional or unconventional threat to health and security.

For example, the fact that a biological attack has occurred may be far from obvious. An attack with a biological weapon may produce an infectious disease epidemic that would sicken and kill large numbers of people over a period of several days. Yet on the first day of the outbreak, there would be no way to know whether the outbreak was caused by a deliberate attack or a naturally occurring disease.

In the absence of an announcement by the attacker or a fortuitous discovery, authorities might well be unaware for days or weeks that an attack has occurred, until patients started to appear in emergency rooms with an unusual or inexplicable illness.

That's why NTI's Global Health and Security Initiative emphasizes that both health and security leaders around the world must be prepared, in an integrated way, to respond to the full spectrum of biological threats.



That spectrum includes:

- ⊗ naturally occurring diseases—these too can be destabilizing if an epidemic is severe enough;
- ⊗ inadvertent release of pathogens, such as through laboratory accidents or research oversights;
- ⊗ deliberate misuse of a biological agent to inflict harm—that is, a biological attack.

Test tubes with plague samples.

Fortunately, many of the measures needed to respond to natural infectious disease outbreaks are also a major part of the response to a biological attack. The essential elements

PROMOTING BEST PRACTICES: THE INTERNATIONAL COUNCIL ON THE LIFE SCIENCES

As part of its mission to safeguard access to pathogens and prevent the misuse of biomedical technology and information, NTI's Global Health and Security Initiative played a major role in launching the International Council for the Life Sciences (ICLS) in late 2005.

ICLS is working to enhance biological security and reduce biological weapons proliferation risks by bringing together experts from around the world in the public and private sectors of the life science community to identify critical biological risks to public safety and security, and to help ensure that the extraordinary advances in biotechnology over the past decade that are bringing great benefits to society are not misused to cause harm. Among its key tasks are developing and promoting guidelines, best practices, codes of conduct and regulations to manage and reduce the risk that biological science, accidentally or intentionally, might cause harm to human beings, the environment or the economy.

ICLS has held a number of international meetings, such as seminars for experts from the G8 countries in Moscow in 2006 and 2007 cosponsored by the I.M. Sechenov Moscow Medical Academy and NP-TEMPO to cooperatively enhance biological security and safety; a conference in Abu Dhabi, UAE in November 2007 for the Gulf, Middle East and North African region to develop a sustainable network to deal with the critical issues of biosafety and biosecurity, and plans to hold a biological risk assessment seminar in London in June 2008.

In addition to NTI's support, ICLS has been supported by the Alfred P. Sloan Foundation, the Bioindustry Initiative (U.S. Department of State), the Global Opportunities Fund (UK Government), the Global Partnership Fund (Foreign Affairs Canada), the John D. and Catherine T. MacArthur Foundation and the Robert and Ardis James Foundation.

of an effective response are early detection and identification of the disease to enable a rapid response to contain the disease and treat the victims.

Biological weapons pose a number of additional challenges that distinguish them from other security threats. They can be relatively easy to produce and less expensive than other weapons that can cause large-scale casualties such as chemical or nuclear weapons. Potentially they can inflict large numbers of casualties with a small quantity of material. Pathogens can be easily concealed and transported; many are found in nature, as well as in government, university and industry laboratories. And information on techniques for the manufacture and delivery of the simpler biological weapons is increasingly available on the internet and in the open scientific literature.

Beyond that lies the vexing question of misuse. That is, the same laboratories, technologies and materials that are used for medical research or to produce pharmaceuticals can also be misused by terrorists or governments to make biological weapons. It is difficult to distinguish biological weapons activities from legitimate work. The essence of the problem lies in people and knowledge and, to a lesser extent, in equipment and facilities.

The Biological and Toxin Weapons Convention of 1972, which has been ratified by 155 states, prohibits the production or acqui-

sition of biological weapons. It has not proved possible to develop an effective verification mechanism and, in any case, the Convention is unlikely to constrain a terrorist group.

To find solutions to the extraordinarily complex biological threat, NTI has engaged in new kinds of thinking and organizing that cut across traditional bureaucratic and political boundaries.

STRATEGIES FOR THREAT REDUCTION

NTI works to reduce global biological threats through its Global Health and Security Initiative (GHSI).

GHSI focuses on two priority areas for action:

- 8 Improving the global capacity for enhanced disease surveillance, in particular on early detection and identification that will enable effective responses to disease outbreaks, whatever their origin.
- 8 Promoting the safe and secure practice of the biomedical sciences.

Highlights of NTI's biological program for 2007 include: advancing the development of the International Council for the Life Sciences, an independent organization whose focus is promoting best practices worldwide in the biological sciences and significant progress toward advancing regional disease surveillance networks in the Middle East and Southeast Asia. Effective global disease surveillance, early detection and response capabilities are the fundamental building blocks of preparedness against infectious disease threats—whether those occur naturally or result from bioterrorism or illegal state weapons. For word of an outbreak to spread effectively among affected countries and regions, channels of communication and cooperation must be established before the outbreak occurs.

That's why NTI and the Global Health and Security Initiative have devoted considerable energy to developing regional networks that strengthen rapid detection, investigation and communication and enable an early and effective response. In two critical regions—the Middle East and Southeast Asia—NTI projects are serving as models for regional cooperation that can be replicated in other areas of the world.



Laboratory technician handling hazardous material.



[top and center] **Photos by GHSI staff during trips to assess laboratory capacity and public health infrastructure in Southeast Asia.**

[bottom] **Leaders from the Thailand Ministry of Health participated in a meeting to discuss ways to enhance the quality of disease surveillance networks around the world.**

The **Middle East Consortium on Infectious Disease Surveillance (MECIDS)** brings together key people from the public health sector in Israel, Jordan and the Palestinian Authority. (see opposite page).

Similarly, the **Mekong Basin Disease Surveillance Network (MBDS)** brings together public health experts from Cambodia, China, Vietnam, Laos, Myanmar and Thailand to enhance cooperation in dealing with infectious diseases. MBDS was established in 1999 with support from the Rockefeller Foundation, and NTI's Global Health and Security Initiative joined this effort in 2005.

In March 2007, the Global Health and Security Initiative, together with the Rockefeller Foundation, brought together MBDS members to participate in a regional table-top exercise to test responses to a hypothetical pandemic influenza emergency. Officials from the six countries—including the ministries of health, foreign affairs, agriculture, tourism and security—as well as U.N. agency officials and specialists participated in the two-day exercise. A team of RAND Corporation public health specialists helped plan and support the exercise. The event was the first time that MBDS countries joined forces in a regional exercise that highlighted the need for a rapid and coordinated regional response. This regional effort drew on the experience of national exercises conducted by each of the six partners. These exercises were also conducted with support from the Global Health and Security Initiative.

Another significant step in the effort to strengthen and create new regional disease surveillance networks came in December 2007. With support from the Rockefeller Foundation, the Global Health and Security Initiative brought together representatives from infectious disease surveillance networks in Africa, the Americas, Europe and the Middle East in Bellagio, Italy to share best practices and lessons learned. Leading experts in infectious disease surveillance from the World Health Organization, the business sector and private foundations also participated. This resulted in a “Call to Action” by policy makers and public health communities around the world to take action to enhance the quality of infectious disease surveillance around the world, particularly in developing countries. The Global Health and Security Initiative is undertaking a project to promote the recommendations in the “Call for Action” that will have the effect of strengthening the effort to counter biological risks.

STRENGTHENING GLOBAL DISEASE SURVEILLANCE, EARLY DETECTION AND RAPID RESPONSE: ARABS AND ISRAELIS COOPERATE TO FIGHT DISEASE

When bird flu broke out in the Middle East, Israeli, Palestinian and Jordanian health officials worked together to share information and prevent its spread. This was possible because of a remarkable cooperative effort called the Middle East Consortium on Infectious Disease Surveillance (MECIDS). MECIDS brings together Israeli, Jordanian and Palestinian public health professionals in a successful, cooperative effort to detect, identify and mitigate infectious disease threats.



MECIDS participants and GHSI staff in Amman, Jordan. From left: Dr. Adel Belbesi (Jordan), 2008 MECIDS Chairman; Dr. Alex Leventhal (Israel), 2007 MECIDS Chairman; Terence Taylor, Director, GHSI; Jennifer Runyon, Senior Program Officer, GHSI; and Major-General Mohammad K. Shiyyab (Jordan) Director, Cooperative Monitoring Centre, Amman.

With the support of a locally-based NGO, Search for Common Ground, NTI helped launch MECIDS in 2003. A major step forward was achieved in January 2007 when the partners assumed full control through an Executive Board.

MECIDS already has proven its worth by responding effectively to outbreaks of avian influenza. A key protocol of MECIDS is that any party must immediately warn the others of a disease occurrence. A 2006 article in *The British Medical Journal* (written by the leading health officials in the consortium) describes how the consortium facilitated the sharing of information about the outbreak of avian flu as well as the effectiveness of coordinated actions to prevent further spread: “We believe that the cooperation, mutual reporting,

and assistance described here had an important effect during these outbreaks of avian flu.” Since 2006, avian influenza outbreaks in birds have been successfully contained and there have been no cases in the human populations of the partners.

MECIDS also brings together officials from the ministries of health and doctors and scientists for regular cross-border information exchanges, provides laboratory and risk communications training, hosts regional

scientific conferences and supports building advanced IT and communications networks.

The network has received major support from the World Health Organization, the World Bank, IBM (which has contributed software, hardware and training) and Becton, Dickinson and Company (which has contributed laboratory and medical supplies). In 2007, with the support of a World Bank grant, MECIDS progressed further as an independent, self-managed organization. It developed a business plan, drafted standing operating procedures and held regular board meetings and training workshops. Although regional conflicts have at times hampered planned meetings and other events, all partners are fully committed to the project.

PROJECTS APPROVED OR ONGOING IN 2007 **BIOLOGICAL**

PROMOTING SCIENCE SECURITY

Educating and Training the International Life Sciences Community on Dual-Use Dangers

To assess the best methods for educating and training life scientists about the risks of dual-use technologies and research and to cultivate a project for curriculum development in this area.

NTI
Washington, DC, USA
Up to \$50,000
2005-2007

International Council for the Life Sciences

To support and sustain an organization to promote best practices and standards for biosafety and biosecurity among the life sciences community to reduce potential proliferation of dangerous pathogens and the misuse of technical information.

International Council for the Life Sciences
Washington, DC, USA
\$397,150
2005-2009

AAAS-NTI Fellowship in Global Security

To strengthen scientific expertise in national security policymaking and encourage scientists to pursue careers in this arena, by supporting biomedical/public health experts to work on national security issues in the U.S. government through a one-year fellowship.

American Association for the Advancement of Science
Washington, DC, USA
\$1,261,763
2001-2008

Regional Reference Laboratory for Viral Hepatitis

To set up a reference laboratory at the facilities of the Federal State Research Initiation-State Research Center of Virology and Biotechnology (VECTOR) that will meet all national and international requirements and regulations for diagnostic work involving the use of molecular biological methods.

VECTOR
Koltsovo, Novosibirsk Oblast, Russia
\$325,500
2007-2009

Regional Training Centers for Biological Safety and Security

To develop a comprehensive strategy for establishing regional training centers for biological safety and security in the Middle East/Gulf/North Africa region and eventually in South and South East Asia. The centers will offer life scientists and laboratory staff on-site technical training in the highest biosafety and biosecurity standards and practices, tailored specifically to their work and regional concerns.

NTI and others
Washington, DC
\$120,000
2007-2008

Brucellosis Vaccine Research

To develop a new vaccine, employing former Soviet bioweapons scientists, to contribute to the management of this disease that threatens domestic and wild animal populations around the world.

All-Russian Research Veterinary Institute
Kazan, Russia;
International Science and Technology Center
Moscow, Russia (in conjunction with the U.S. Department of State)
\$600,000
2003-2007

Employing Former Bioweapons Scientists in Russia to Manufacture Diagnostic Enzymes for Endemic Infectious Disease Threats

To redirect former bioweapons scientists who were at risk of unemployment due to ongoing bankruptcy procedures at the State Research Center for Applied Microbiology and Biotechnology (SRCAM) Obolensk, by providing them with alternative, long-term employment relevant to their scientific expertise.

SRCAM
Obolensk, Moscow Region, Russia
\$400,000
2005-2008

STRENGTHENING GLOBAL DISEASE SURVEILLANCE, EARLY DETECTION AND RAPID RESPONSE

Building Capacity for Regional Bioterrorism Preparedness in Asia

To support an online symposium on bioterrorism preparedness for interested Asia Pacific Economic Cooperation (APEC) member countries.

University of Washington
Seattle, WA, USA
\$49,771
2006-2007

Developing Diagnostic Kits for Select Biological Agents

To develop rapid diagnostic tests for select biological agents of most significance to Russia, to introduce them to health-care practices and to organize manufacturing of such tests. Once developed, these tests could help fill a critical global need for better diagnostic tests for the detection of infectious diseases.

Moscow State Central Research Institute for Epidemiology of the Health Ministry of Russia
Moscow, Russia
\$300,000
2005-2008

Strengthening National Health Preparedness

To assess preparedness for biological and chemical attacks in several nations by establishing and testing a set of international guidelines for preparedness, comparing them against existing public health capabilities that states have in place and making recommendations for improving those capabilities.

World Health Organization
Geneva, Switzerland
\$400,000
2004-2008

Middle East Consortium on Infectious Disease Surveillance

To improve regional capacity for infectious disease surveillance in the Middle East by developing a food-borne and water-borne disease surveillance system among Israel, the Palestinian Authority and Jordan, and by designing an infectious disease epidemiology course to build regional rapid response capabilities in the event of disease outbreaks.

NTI and others
Washington, DC, USA
\$1,437,000
2002-2008

Model Disease Surveillance System in Iran

To support the policy collaborations between American specialists at the Policy and Global Affairs Division of the National Research Council (NRC), acting on behalf of the National Academy of Sciences, and Iranian specialists at the Iranian Academy of Sciences, in their work to develop a model program of disease surveillance in Iran.

National Academy of Sciences
Washington, DC, USA
\$50,000
2005-2007

Joint Training on Laboratory Biosecurity and Biosafety in Egypt

To support a workshop to raise awareness of the threat of bioterrorism and the need for safe and secure handling of dangerous biological materials in bioscience facilities.

*Academy of Scientific Research and Technology
Cairo, Egypt
\$70,000
2006-2007*

Biological Weapons Threat Reduction: Expanding Outbreak Reporting and Education in the New Independent States

To reduce the threat of biological weapons and other emerging infectious diseases in the New Independent States, the International Society for Infectious Diseases will expand the scope of a Russian language-based electronic network (PROMED) that rapidly disseminates information about outbreaks of infectious diseases, including potential biological weapons attacks, to include more physicians, scientists and public health officials throughout the New Independent States.

*International Society for Infectious Diseases
Brookline, MA, USA
\$320,475
2005-2008*

Creating a Regional Disease Surveillance System in South Asia

To develop a regional disease surveillance network that would initially bring together India, Pakistan and Bangladesh.

*NTI
Washington, DC, USA
Up to \$275,000
2005-2008*

Rapid Outbreak Response Revolving Fund

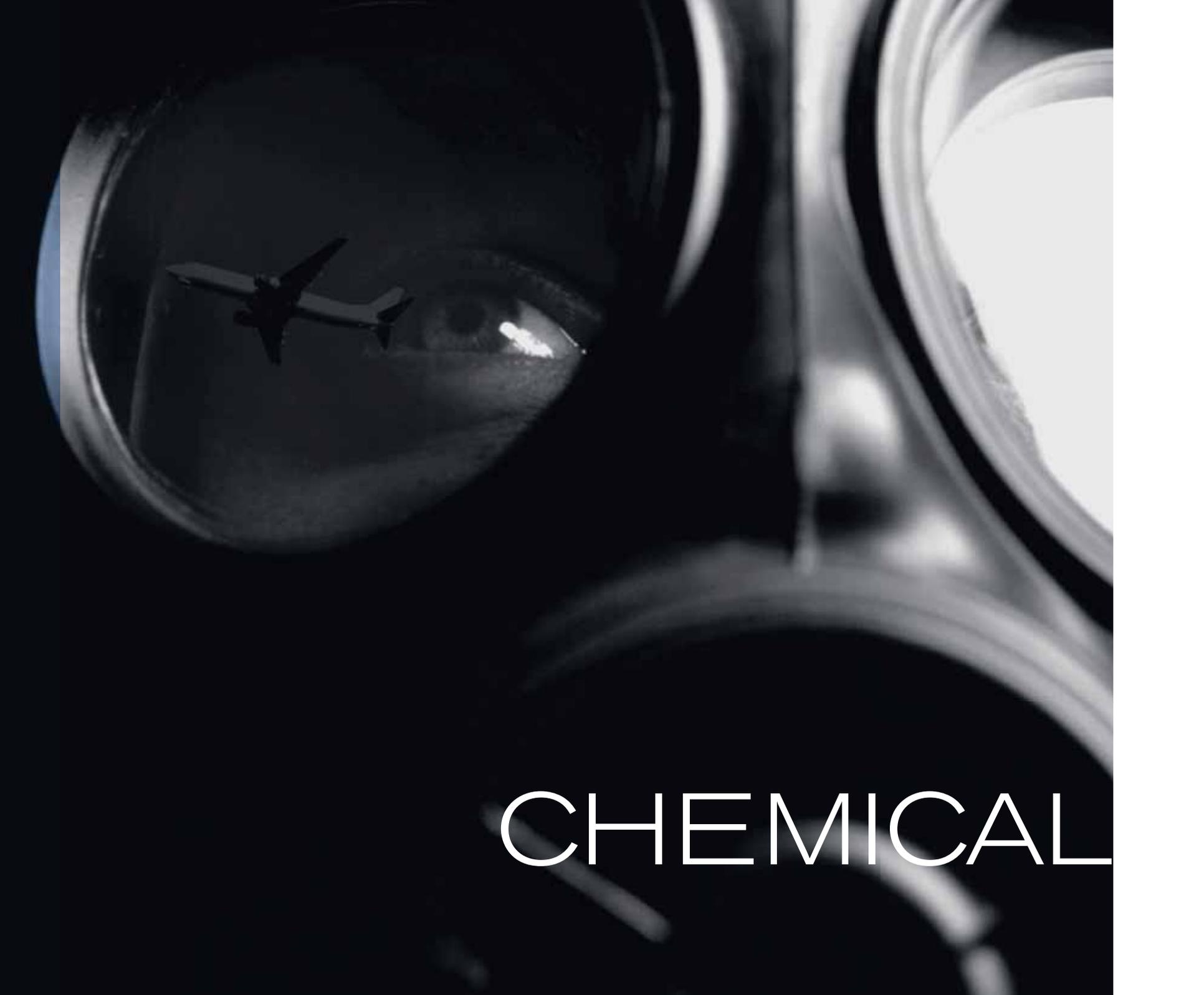
To create within the World Health Organization an account dedicated to supporting rapid emergency response to infectious disease outbreaks.

*World Health Organization
Geneva, Switzerland
\$500,000
2003-2007*

Pandemic Influenza Simulation Exercises in Southeast Asia

To strengthen national and sub-regional disease surveillance capacity in the Mekong Basin area (Thailand, Vietnam, Cambodia, Laos, Myanmar, and China-Yunnan province), and develop a system that operates across borders, responds quickly to regional disease threats, and works to create equity in the national capacities to detect and respond to local outbreaks, and, hence, prevent regional or even global emergencies.

*NTI and others
Washington, DC, USA
\$610,000
2006-2007*



CHEMICAL

THE NATURE OF THE THREAT

**SECURING AND
DISMANTLING
CHEMICAL WEAPONS
AND SECURING
OR REDIRECTING
PRODUCTION FACILITIES
ARE ESSENTIAL TO
REDUCING TERRORIST
CHEMICAL THREATS.**

Even minute quantities of agents such as mustard gas, VX and sarin can sicken and kill and could be a very potent terrorist weapon against civilians. Used extensively in World War I, and by Saddam Hussein during the Iran-Iraq War of the 1980s, chemical weapons have met widespread international condemnation.

The Chemical Weapons Convention, which came into force in 1997, completely prohibits the development, production, stockpiling and use of chemical weapons. The treaty also commits the signatories to destroy all of their stockpiles of chemical weapons—but that has proven to be an expensive and technically challenging task.

At the time the treaty went into effect, the United States and Russia had more than 90 percent of the 71,000 metric tons of the total declared stockpile of chemical weapons. While the Chemical Weapons Convention called on all states to entirely destroy their stored chemical weapons by 2007, that has not occurred.

As of August 2007, about one-third of the original 71,000 tons has been destroyed, along with roughly one-third of the 8.6 million declared chemical munitions and containers. All other declared chemical weapon stockpiles have been verified and inventoried—though it should be noted that North Korea and several Middle Eastern states have not ratified the convention.

Both Russia and the United States informed the Organization for the Prohibition of Chemical Weapons that they would not meet the 2007 deadline and were granted extensions. The U.S. Government Accountability Office announced that it does not expect Russia to reach 100 percent destruction until 2027, and the United States until 2014, both after the treaty's final, extended deadline of 2012.

In addition to known supplies, chemical weapons caches around the world are unaccounted for and may be poorly secured. There are also more than 6,000 commercial chemical facilities that use, produce or store toxic materials that could be deadly if released. Many of these facilities are located near densely populated areas and could be vulnerable to a terrorist attack.

Inadequately secured chemical weapons stockpiles and commercial facilities are a weak link in the chain of global security that could readily be exploited by terrorists, with deadly results. For that reason, securing and dismantling chemical weapons and securing or redirecting production facilities are essential to reducing terrorist chemical threats.

STRATEGIES FOR THREAT REDUCTION



[left to right] **The Chemical Weapons Convention logo.**

NTI's flag flies outside the Shchuch'ye Chemical Weapons Destruction Facility.

NTI Board Member Senator Richard Lugar and NTI Co-Chairman Sam Nunn inspect a bridge being built to transport chemical weapons by rail to the Shchuch'ye destruction facility. NTI is helping fund the construction.



SECURING AND DESTROYING CHEMICAL WEAPONS STOCKPILES

Recognizing that securing and destroying chemical weapons stockpiles are the essential task in chemical weapons threat reduction, NTI has focused its efforts in that direction. NTI supports and works with the G8-led Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, a 10-year international effort to prevent WMD proliferation around the world.

NTI's top chemical weapons priority remains facilitating the destruction of chemical weapons in Russia, with a focus on Shchuch'ye in central Russia, where a destruction facility is getting major international assistance. The Shchuch'ye facility will eliminate many of Russia's most lethal and proliferation-prone chemical weapons (approximately 1.9 million artillery shells filled with the nerve agents sarin, soman and VX).

U.S. Senator Richard Lugar and NTI Co-Chairman Sam Nunn visited the Shchuch'ye Chemical Weapons Destruction Facility in August 2007.

At Shchuch'ye, the United States, Russia, Canada, the Czech Republic, the European Union, Italy, Norway, Switzerland, and the United Kingdom are working together to build the facility. The efforts of these nations and NTI augment the work of the U.S. and Russian governments to eliminate these weapons in accordance with Russia's responsibilities under the Chemical Weapons Convention.



for the kind of international cooperation that is essential for reducing the global threats from nuclear, biological and chemical weapons.

Canada has contributed \$28 million for construction of a railway to safely transport the chemical munitions from the chemical weapons storage depot near Planovy to the destruction facility in Shchuch'ye. NTI has joined Canada in this effort, contributing \$1 million to support the railway construction.

On a larger scale, the U.S. Department of Defense, through the Nunn-Lugar Cooperative Threat Reduction Program, is funding the construction of most of the Shchuch'ye facility, at a cost of some \$1 billion.

The infrastructure project is a model

PROJECTS APPROVED OR ONGOING IN 2007

CHEMICAL

Supporting Russian Chemical Weapons Destruction

To provide \$1 million, matched by a minimum of \$2 million from other sources, for high-priority infrastructure development for the Shchuch'ye Chemical Weapons Destruction Facility.

Global Partnership Program Canada Department of Foreign Affairs and International Trade

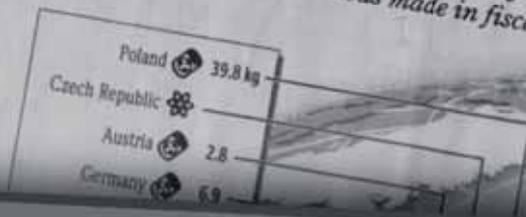
Ottawa, Canada

\$1,000,000

2001-2007

Securing Nuclear Stockpiles

Highly enriched uranium (HEU) and plutonium — the essential ingredients of nuclear weapons — exist in dozens of countries, with security that ranges from excellent to appalling. Programs sponsored by the Energy and Defense departments help remove such materials to secure locations and assist other nations in improving security at facilities that hold nuclear materials. The map below charts progress that was made in fiscal 2006:



Symbols

- Enriched uranium removed (measured in kilograms)
- Security upgrades completed at nuclear material building
- Security upgrades completed at nuclear warhead site
- HEU-fueled research reactor shut down
- HEU-fueled research reactor converted to low-enriched uranium
- HEU-fueled research reactor with security upgrades completed

Key

- Has plutonium (Spent nuclear fuel)
- Has highly enriched uranium (HEU)
- Has both

NOTE: Countries that have sufficient quantities to require the highest levels of security, based on International Atomic Energy Agency recommendations.

Securing the Bomb 2007

MATTHEW BUNN



COMMUNICATIONS

NTI's public awareness projects are reducing the global threats from nuclear, biological and chemical weapons by shining a spotlight on the tremendous gap between the threats and the current global response, focusing increased attention on what can be done to reduce those threats and catalyzing greater action to reduce them.

Since a concerned, informed, attentive public can be a powerful force for holding governments accountable and spurring greater action, public outreach and education are an important part of NTI's mission.



The “Turning the D into an A” project included discussions about preventing nuclear terrorism with local leaders.

[left] **Michael Hurley, Counter-Terrorism Advisor to NTI, and Carie Lemack, Founder, Families of September 11 with officials in St. Petersburg, Florida: Chief of Police Charles Harmon, Mayor of St. Petersburg Rick Baker and Fire Chief James Large.**

[right] **Matthew Bunn, Project on Managing the Atom, Harvard University; Carie Lemack, Founder, Families of September 11; and Nancy Aronson, Board Member, Families of September 11; with Mayor Frank C. Guinta of Manchester, NH.**

NTI's communications activities aim to:

- 8 Increase the quality and accessibility of information about the threats from nuclear, biological and chemical weapons and what must be done to reduce those threats;
- 8 Support new thinking and the development of new expertise to reduce the risk of use and prevent the spread of nuclear, biological and chemical weapons;
- 8 Promote dialogue and common ground solutions to reduce imminent global dangers and take these issues beyond the small group of policymakers and experts who work on them and into the mainstream public policy debate.

SPURRING ACTION FOR A SAFER WORLD: TURNING THE D INTO AN A

When the bipartisan 9/11 Commission issued its report on the events of September 11, 2001, it recommended an all-out effort to secure weapons of mass destruction to keep them out of terrorist hands. But in its final report card in December 2005, the commission gave the government a “D” for its progress to date.

NTI joined forces with Families of September 11, a nonprofit organization of those who lost loved ones in the terrorist attacks of 9/11, to urge greater action and, in effect, turn that “D” into an “A.”

NTI and Families of September 11 worked to bring increased attention to the need to prevent nuclear terrorism through organizing dozens of screenings and discussions of the nuclear terrorism docudrama *Last Best Chance* throughout the United States. There was particular emphasis on outreach to first responders; for example, all firefighters in Las Vegas watched the film during the week of September 11, 2007.

College-level teaching materials were developed in cooperation with the Center for Nonproliferation Studies and distributed to more than 200 professors teaching foreign affairs, terrorism and related topics in the United States. Faculty, including professors at the University of Washington, University of Massachusetts, the U.S. Naval Academy and Pepperdine University, are using these materials in their courses.

Five thought-provoking television public service announcements featuring members of NTI’s Board of Directors, Families of September 11 and the Chairman and

Vice-Chairman of the 9/11 Commission, were filmed and distributed to television and cable stations throughout the country. Over the course of the project, these were viewed by people in all 50 states and the District of Columbia—helping to spur people to visit the project’s website—www.saferworld.org—to learn more about these issues.

Finally, because action to prevent nuclear terrorism can be most directly taken by members of Congress and the President, special attention was paid to raising awareness among elected officials about the threat of nuclear terrorism and what they could do to help prevent it, specifically how the pace to lock down and secure nuclear weapons around the globe should be accelerated. Members of Families of September 11 and NTI staff conducted more than 50 meetings with members of Congress, Senators, key Congressional staff members and members of the White House National Security Council staff.

Overall, the project achieved its goal of making more Americans and significant decision-makers aware of the issue and empowering citizens to speak out. In fact, during a January 2008 Democratic presidential candidate’s debate in New Hampshire, ABC News anchor Charles Gibson’s first question to the candidates was about their policies to prevent nuclear terrorism.

In addition to funding from NTI, this project was supported by generous contributions from Dick and Fran Anderson, The Toledo Community Foundation on behalf of members of the Stranahan family and Carnegie Corporation of New York.

WWW.NTI.ORG

NTI's website is an essential educational and research tool for understanding the global threats posed by nuclear, biological and chemical weapons, terrorism and related issues and how these threats can be reduced or eliminated. NTI works with The National Journal Group, the Center for Nonproliferation Studies at the Monterey Institute of International Studies and other parties to ensure that www.nti.org offers authoritative, factual information useful to experts, journalists, policymakers and those new to the subject. Millions of people from more than 150 countries have visited the site; recent data indicates that more than 30 percent of the daily visits come from return visitors, a strong indicator that people find the information provided to be accurate and useful.

HIGHLIGHTS OF WWW.NTI.ORG

- 8 *Global Security Newswire* a free, daily news service covering worldwide developments in nuclear, biological and chemical weapons, terrorism and related issues written by the highly respected National Journal Group staff. www.nti.org/gsn
- 8 *Issue Briefs* that offer a short introduction and in-depth analysis of a wide range of international security issues. www.nti.org/issuebriefs
- 8 *Country Profiles* with information on nuclear, biological, chemical and missile programs in more than 30 countries. www.nti.org/countries
- 8 *Self-guided Tutorials* on Biological Warfare Terrorism, the Nuclear Non-Proliferation Treaty and other essential topics. www.nti.org/tutorials
- 8 *Nonproliferation Databases* with the world's most comprehensive open-source information containing current and archived material on proliferation. It includes a wide range of sources including academic and trade journals, UN and IAEA documents and much more. www.nti.org/db

The NTI website is a gateway to the best information about weapons of mass destruction, proliferation, terrorism and related topics and is updated frequently. Bookmark the site at www.nti.org.

The screenshot shows the NTI website interface. At the top, there is a logo for NTI (National Technical Information Center) with the tagline "Working for a Safer World". Below the logo is a navigation menu with links for "ABOUT NTI", "PRESS ROOM", "LINKS", "PYCKHH", "RESEARCH LIBRARY", "LEARN MORE", and "WFO 411". A search bar is located in the top right corner. The main content area is titled "PAKISTAN PROFILE" and includes a sub-header "NUCLEAR | BIOLOGICAL | CHEMICAL | BWC/CT". The page is divided into several sections:

- Introduction:** A paragraph describing Pakistan's nuclear program, starting in the early 1970s after its defeat in the Indo-Bangladesh war of 1971. It mentions Islamabad's view of nuclear weapons as essential for safeguarding the South Asian balance of power and offsetting its conventional inferiority.
- Recent Updates:** A table listing recent updates with dates:

Update	Date
Nuclear Chronology	March 13, 2008
Missile Overview	Dec. 20, 2007
Nuclear Overview	Dec. 20, 2007
Missile Chronology	Dec. 13, 2007
Biological Overview	Sep. 11, 2006
Chemical Overview	Sep. 11, 2006

- Other Resources:** A list of various reports and documents, including "Nuclear Proliferation and South Asia: Recent Trends", "WMD-411: Background on Relations Between India and Pakistan", and "Issue Brief: Seven Years After the Nuclear Tests (2005)".

SECURING THE BOMB



For the past several years, NTI has commissioned an annual publication, *Securing the Bomb*. This report is the most complete, up-to-date and authoritative assessment of the threat of nuclear terrorism and the progress of government efforts to prevent it. The publication and related online resources are researched and written by the Project on Managing the Atom of Harvard University's Belfer Center for Science and International Affairs.

In 2007, the importance of the report was underscored when *The Washington Post* sought permission from NTI and the Belfer Center to release it. An op-ed article by *Securing the Bomb* author Matthew Bunn was published with a special graphic illustrating global progress to secure nuclear stockpiles. *Washingtonpost.com* offered additional features including a photo gallery and a quiz testing reader's knowledge of nuclear dangers.

NTI LASTBESTCHANCE

ABOUT THE THREAT ABOUT THE FILM ABOUT NTI

LASTBESTCHANCE

[SEE FLASH] ORDER THE FILM

WATCH THE TRAILER: MP4 | WINDOWS MEDIA PLAYER

As seen on HBO

Last Best Chance was produced with support from the Nuclear Threat Initiative, with additional funding from the Carnegie Corporation of New York and the John D. and Catherine T. MacArthur Foundation.

This film is based on facts. Some events depicted may have already happened. Some may be happening now. All may happen in the near future if we don't act now to prevent them.

Read a *New Yorker* column about the film.
Read *NBC's Meet the Press* Transcript
Read *ABC's Nightline* Transcript
Work to secure nuclear weapons and materials remains dangerously slow. Read a report by *Nuclear* experts.
Learn more. Sam Rahn

Send Me the Film
Click here for a free DVD.

Donate to NTI
Click here to support NTI's work to keep weapons and materials secure.

Stay Informed
Click here for daily news delivered to your inbox.

Tell a Friend
Click here and tell your friends about the film.

LAST BEST CHANCE

Last Best Chance, the 45-minute film that NTI released in 2005 to raise awareness about the threats from unsecured nuclear weapons and materials, continues to find an audience.

The film stars former U.S. Senator Fred Thompson as a U.S. President who must deal with the threat of nuclear terrorism. The film is a wakeup call to secure and destroy nuclear weapons and materials before it is too late. It has been shown in hundreds of community screenings, and is being used to motivate and train those responsible for preventing nuclear terrorism, including the U.S. Department of Homeland Security.

Copies of the film can be ordered online at www.lastbestchance.org. To date, more than 135,000 copies of the film have been distributed to people from more than 110 countries.

PROJECTS APPROVED OR ONGOING IN 2007 **COMMUNICATIONS AND EDUCATION**

Global Security Newswire

To support a daily news service—available exclusively on the NTI website—with original reporting and a comprehensive snapshot of the day's global news on nuclear, biological and chemical weapons, terrorism and missile issues.

National Journal Group, Inc.
Washington, DC, USA
\$918,000
2007-2008

Online Research Center and Library

To build, expand and update a comprehensive online research library with information, analysis and educational materials about the threats from nuclear, biological and chemical weapons. The library builds on the most comprehensive open-source nonproliferation databases in the world and brings together a range of expert opinion and analysis on these issues.

Monterey Institute of International Studies Center for Nonproliferation Studies
Monterey, CA, USA
\$650,509
2007-2008

Securing the Bomb

To track the progress and budgets of global nuclear security programs with an annual report and website and make recommendations for accelerating the pace and effectiveness of this threat reduction work.

Project on Managing the Atom
Belfer Center for Science and International Affairs
John F. Kennedy School of Government
Harvard University
Cambridge, MA, USA
\$650,000
2006-2008

Public Opinion Project

To conduct public opinion research on the threats from weapons of mass destruction.

NTI
Washington, DC, USA
\$339,500
2002-2007

Global Health and Security Outreach

To develop and implement outreach activities to advance NTI's Global Health and Security Initiative.

NTI
Washington, DC, USA
\$75,000
2004-2007

Last Best Chance—Public Education on Nuclear Threats

To produce and distribute a fact-based fictional film that illustrates the threat of nuclear terrorism. The film highlights the threats and what should be done to address them, and reminds viewers of the real human, political and economic costs of a nuclear terrorism incident.

NTI (in conjunction with the Carnegie Corporation of New York and The John D. and Catherine T. MacArthur Foundation)
Washington, DC, USA
\$1,000,000
2005-2007

Safer World Action Network

To engage and expand the network of individuals interested in efforts to reduce the threats from nuclear, biological and chemical weapons and materials with the goal of inspiring individuals to become personally involved in efforts to expand and accelerate the pace of work to reduce these threats.

NTI
Washington, DC, USA
\$500,000
2006-2008

South Asian Security and WMD Website Module

To continue a weapons of mass destruction module on the Institute of Peace and Conflict Studies website that draws from South Asian, Chinese and Central Asian sources and provides comprehensive news analysis and reference materials relating to nuclear, chemical and biological weapons and to support research, workshops and publications on nonproliferation and nuclear, biological and chemical threats.

Institute of Peace and Conflict Studies
New Delhi, India
\$334,800
2004-2008

Research and Analysis

To conduct research and analysis to support NTI projects and activities.

Monterey Institute of International Studies Center for Nonproliferation Studies
Monterey, CA, USA
\$155,885
2004-2007

Public Education Project: Turning the “D” into an “A”

To support NTI and Families of September 11 in raising public awareness about nuclear dangers throughout the United States. Activities include screenings and discussions about the film *Last Best Chance*, television public service announcements, and distributing educational materials that can be used in university courses by professors across the country.

NTI
Washington, DC, USA
Up to \$300,000
2006-2007

What's Ne...
and Finance

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agreed to step down...
executive is leaving...
package valued at...
million, including \$20...
sh severance. He will...
by Frank Blake, the...
ve chairman and ex-...
president. A1, A12, C3

tes suggest some of...
doubts about the...
ocks fell on the news...
11.37 at 12474.52...
bonds rose A2, C1, C6
k mutual funds re-...
rs, on average in...
ds focused overseas...
tar performers. B3

11.2% Abrupt Exit

THE WALL STREET JOURNAL.

OPINION

Thursday, January 4, 2007

A World Free of Nuclear Weapons

By George P. Shultz,
William J. Perry,
Henry A. Kissinger
And Sam Nunn

Nuclear weapons today present tremendous dangers, but also an historic opportunity. U.S. leadership will be required to take the world to the next stage—to a solid consensus for reversing reliance on nuclear weapons globally as a vital contribution to preventing their proliferation into potentially dangerous hands, and ultimately ending them as a threat to the world.

A bold initiative, consistent with our moral heritage.

Nuclear weapons were essential to maintaining international security during the Cold War because they were a means of deterrence. The end of the Cold War made the doctrine of mutual Soviet-American deterrence obsolete. Deterrence continues to be a relevant consideration for many states with regard to threats from other states. But reliance on nuclear weapons for this purpose is becoming increasingly hazardous and decreasingly effective.

North Korea's recent nuclear test and Iran's refusal to stop its program to enrich uranium—potentially to weapons grade—highlight the fact that the world is now on the precipice of a new and dangerous nuclear era. Most alarmingly, the likelihood that non-state terrorists will get their hands on nuclear weaponry is increasing. In today's war waged on world order by terrorists, nuclear weapons are the ultimate means of mass devastation. And non-state terrorist groups with nuclear weapons are conceptually outside the bounds of a deterrence strategy and need to be eliminated.

no nuclear weapon was used during the Cold War by design or by accident. Will new nuclear nations and the world be as fortunate in the next 50 years as we were during the Cold War?

Leaders addressed this issue in earlier times. In his "Atoms for Peace" address to the United Nations in 1953, Dwight D. Eisenhower pledged America's "determination to help solve the fearful atomic dilemma—to devote its entire heart and mind to find the way by which the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life." John F. Kennedy, seeking to break the logjam on nuclear disarmament, said, "The world was not meant to be a prison in which man awaits his execution."

Rajiv Gandhi, addressing the U.N. General Assembly on June 9, 1988, appealed, "Nuclear war will not mean the death of a hundred million people. Or even a thousand million. It will mean the extinction of four thousand million: the end of life as we know it on United Nations to seek your support. We seek your support to put a stop to this madness."

Ronald Reagan called for the abolishment of "all nuclear weapons," which he considered to be "totally irrational, totally inhumane, good for nothing but killing, possibly destructive of life on earth and civilization." Mikhail Gorbachev shared this vision, which had also been expressed by previous American presidents.

Although Reagan and Mr. Gorbachev failed at Reykjavik to achieve the goal of an agreement to get rid of all nuclear weapons, they did succeed in turning the arms race on its head. They initiated steps leading to significant reductions in deployed long- and intermediate-range nuclear forces, including the elimination of an entire class of threatening missiles.

What will it take...

ditional Protocols are innovative approaches that provide powerful new tools for detecting activities that violate the NPT and endanger world security. They deserve full implementation. The negotiations on proliferation of nuclear weapons by North Korea and Iran, involving all the permanent members of the Security Council plus Germany and Japan, are crucially important. They must be energetically pursued.

But by themselves, none of these steps are adequate to the danger. Reagan and General Secretary Gorbachev aspired to accomplish more at their meeting in Reykjavik 20 years ago—the elimination of nuclear weapons altogether. Their vision shocked experts in the doctrine of nuclear deterrence, but galvanized the world.



would lay the groundwork for a world free of the nuclear threat. Steps would include:

- Changing the Cold War posture of deployed nuclear weapons to increase warning time and thereby reduce the danger of an accidental or unauthorized use of a nuclear weapon.
- Continuing to reduce substantially the size of nuclear forces in all states that possess them.
- Eliminating short-range nuclear weapons designed to be forward-deployed.
- Initiating a bipartisan process with the Senate, including understandings to increase confidence and provide for periodic review, to achieve ratification of the Comprehensive Ban Treaty.

Achieving the goal of a world free of nuclear weapons will also require effective measures to impede or counter any nuclear-related conduct that is potentially threatening to the security of any state or peoples.

Reassertion of the vision of a world free of nuclear weapons and practical measures toward achieving that goal would be, and would be perceived as, a bold initiative consistent with America's moral heritage. The effort could have a profoundly positive impact on the security of future generations. Without the bold vision, the actions will not be perceived as fair or urgent. Without the actions, the vision will not be perceived.

NUCLEAR SECURITY PROJECT

In January 2007, four former U.S. government officials, each with decades of experience in national security and foreign policy, published an article in *The Wall Street Journal* titled “A World Free of Nuclear Weapons.”

Former Secretaries of State George Shultz and Henry Kissinger, former Secretary of Defense and NTI Board Member Bill Perry and former Senator and NTI Co-Chairman Sam Nunn wrote that “the world is now on the precipice of a new and dangerous nuclear era” that will be “more precarious, psychologically disorienting, and economically even more costly than was Cold War deterrence.” They warned that the actions being taken now to reduce nuclear threats are not “adequate to the danger.” They said “U.S. leadership will be required to take the world to the next stage—to a solid consensus for reversing reliance on nuclear weapons globally as a vital contribution to preventing their proliferation into potentially dangerous hands, and ultimately ending them as a threat to the world.”

Their op-ed also outlined ten steps to help change direction and reduce nuclear dangers. They wrote that “without the bold vision, the actions will not be perceived as fair or urgent. Without the actions, the vision will not be perceived as realistic or possible.”

Each step would reduce nuclear risk in and of itself, and many of these steps have been advanced by NTI through its direct action projects and awareness efforts.

“THE ACCELERATING SPREAD OF NUCLEAR WEAPONS, NUCLEAR KNOW-HOW AND NUCLEAR MATERIAL HAS BROUGHT US TO A NUCLEAR TIPPING POINT. THE STEPS WE ARE TAKING NOW ARE NOT ADEQUATE TO THE DANGER.”

GEORGE P. SHULTZ, WILLIAM J. PERRY,
HENRY A. KISSINGER AND SAM NUNN

THE STEPS

- 1.** Changing the Cold War posture of deployed nuclear weapons to increase warning time and thereby reduce the danger of an accidental or unauthorized use of a nuclear weapon.
- 2.** Continuing to reduce substantially the size of nuclear forces in all states that possess them.
- 3.** Eliminating short-range nuclear weapons designed to be forward-deployed.
- 4.** Initiating a bipartisan process with the Senate, including understandings to increase confidence and provide for periodic review, to achieve ratification of the Comprehensive Test Ban Treaty, taking advantage of recent technical advances, and working to secure ratification by other key states.
- 5.** Providing the highest possible standards of security for all stocks of weapons, weapons-usable plutonium and highly enriched uranium everywhere in the world.
- 6.** Getting control of the uranium enrichment process, combined with the guarantee that uranium for nuclear power reactors could be obtained at a reasonable price, first from the Nuclear Suppliers Group and then from the International Atomic Energy Agency (IAEA) or other controlled international reserves. It will also be necessary to deal with proliferation issues presented by spent fuel from reactors producing electricity.
- 7.** Halting the production of fissile material for weapons globally; phasing out the use of highly enriched uranium in civil commerce and removing weapons-usable uranium from research facilities around the world and rendering the materials safe.
- 8.** Redoubling our efforts to resolve regional confrontations and conflicts that give rise to new nuclear powers.
- 9.** Ensuring that we have effective means to verify compliance with commitments specified in the above steps and to counter nuclear-related conduct that is potentially threatening to the security for any state or peoples.
- 10.** Intensive work with leaders of the countries in possession of nuclear weapons to turn the goal of a world without nuclear weapons into a joint enterprise.

The interest, momentum and expanded political space that has been created since the January 2007 article was published has been extraordinary, with positive responses from people all over the world.

In the United States, 17 of the 24 living former Secretaries of State, Secretaries of Defense and National Security Advisors from nine Administrations, both Republican and Democratic, support the effort. These include: Madeleine Albright, Richard V. Allen, James A. Baker III, Samuel R. Berger, Zbigniew Brzezinski, Frank Carlucci, Warren Christopher, William Cohen, Lawrence Eagleburger, Melvin Laird, Anthony Lake, Robert McFarlane, Robert McNamara and Colin Powell.

Secretary Shultz, Dr. Perry, Dr. Kissinger and Senator Nunn are working together to advance these ideas through the Nuclear Security Project.

The Nuclear Security Project is designed to motivate governments to rethink their policies, change direction and act on the steps that will reduce the risk of a nuclear weapon being used by increasing understanding, awareness, support and action by policymakers, policy experts and the public around the world for purposefully and significantly changing direction and reducing these nuclear dangers. NTI serves as the general secretariat of the Project, responsible for developing, managing and implementing all activities and coordinating the activities and work of the authors, in coordination with the Hoover Institution.

Follow the work of the Nuclear Security Project online at www.nuclearsecurity.org

PROJECTS APPROVED OR ONGOING IN 2007

NUCLEAR SECURITY PROJECT

Nuclear Security Project

To help build consensus for reversing reliance on nuclear weapons globally to prevent their spread into potentially dangerous hands, and ultimately end them as a threat to the world by closing analytic gaps and building momentum for action by leaders and experts in key countries around the world.

NTI

Washington, DC, USA

Up to \$3,000,000

2007-2008

“AND LET ME SAY TODAY BRITAIN IS PREPARED TO USE OUR EXPERTISE TO HELP DETERMINE THE REQUIREMENTS FOR THE VERIFIABLE ELIMINATION OF NUCLEAR WARHEADS. AND I PLEDGE THAT IN THE RUN-UP TO THE NON PROLIFERATION TREATY REVIEW CONFERENCE IN 2010 WE WILL BE AT THE FOREFRONT OF THE INTERNATIONAL CAMPAIGN TO ACCELERATE DISARMAMENT AMONGST POSSESSOR STATES, TO PREVENT PROLIFERATION TO NEW STATES, AND TO ULTIMATELY ACHIEVE A WORLD THAT IS FREE FROM NUCLEAR WEAPONS.”

UK PRIME MINISTER GORDON BROWN

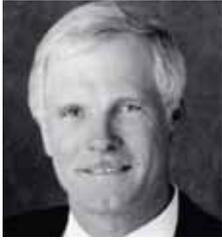
January 21, 2008

THE BOARD OF DIRECTORS



Not shown: U.S. Senator Pete V. Domenici, General Eugene E. Habiger and Dr. Alexei Arbatov.

TED TURNER



Ted Turner is Co-Chairman of the Nuclear Threat Initiative (NTI). Mr. Turner founded NTI when he realized that several years after the end of the Cold War, the United States and Russia still had thousands of nuclear weapons on hair-trigger alert, that global nuclear threats were in some ways growing worse and that governments were not moving quickly enough to address these threats.

Mr. Turner is the founder of CNN—the world's first live, in-depth, round-the-clock news television network. Whether in billboard advertisement, cable television, sailing, environmental initiatives or philanthropy, Mr. Turner's vision and determination have resulted in bold, big achievements.

Mr. Turner is the founder of the United Nations Foundation, which manages his historic \$1 billion gift to support the United Nations' work in addressing the world's most pressing problems; Chairman of the Turner Foundation, his family's private grant-making organization that focuses on population and the environment; and a partner in the successful Ted's Montana Grill restaurant chain, which operates more than 40 locations nationwide. He is also Chairman of Turner Enterprises, Inc. (TEI), which manages private landholdings in an economically sustainable and ecologically sensitive manner, while promoting the conservation of native species. Mr. Turner is the recipient of numerous honorary degrees, industry awards and civic honors, including being named *Time* magazine's 1991 Man of the Year and *Broadcasting and Cable Magazine's* Man of the Century in 1999.

SENATOR SAM NUNN



Former U.S. Senator Sam Nunn is Co-Chairman and Chief Executive Officer of the Nuclear Threat Initiative. He served as a United States Senator from Georgia for 24 years, from 1972-1996.

Senator Nunn attended Georgia Tech, Emory University and Emory Law School, where he graduated with honors in 1962. After active duty service in the U.S. Coast Guard, he served six years in the U.S. Coast Guard Reserve. He first entered politics as a Member of the Georgia House of Representatives in 1968.

During his tenure in the U.S. Senate, Senator Nunn served as Chairman of the Senate Armed Services Committee and the Permanent Subcommittee on Investigations. He also served on the Intelligence and Small Business Committees. His legislative achievements include the landmark Department of Defense Reorganization Act, drafted with the late Senator Barry Goldwater, and the Nunn-Lugar Cooperative Threat Reduction Program, which provides assistance to Russia and the former Soviet republics for securing and destroying their excess nuclear, biological and chemical weapons.

In addition to his work with NTI, Senator Nunn has continued his service in the public policy arena as a distinguished professor in the Sam Nunn School of International Affairs at Georgia Tech and as chairman of the board of the Center for Strategic and International Studies in Washington, DC.

CHARLES B. CURTIS



Charles B. Curtis is the President and Chief Operating Officer of the Nuclear Threat Initiative.

Before joining NTI, Mr. Curtis served as the Executive Vice President and Chief Operating Officer of the United Nations Foundation and was a partner in Hogan & Hartson, a Washington based

law firm with domestic and international offices.

Mr. Curtis served as Under Secretary and, later, Deputy Secretary of the U.S. Department of Energy from February 1994 to May 1997. He was Chief Operating Officer of the Department and, among other duties, had direct programmatic responsibility for all of the Department's energy, science, technology and national security programs.

Mr. Curtis is a lawyer with over 15 years' practice experience and more than 18 years in government service. He was a founding partner of the Washington law firm Van Ness Feldman. Mr. Curtis served as Chairman of the Federal Energy Regulatory Commission from 1977 to 1981 and has held positions on the staff of the U.S. House of Representatives, the U.S. Treasury Department, and the Securities and Exchange Commission. He is a member of the Council on Foreign Relations.

DR. ALEXEI ARBATOV



Alexei Arbatov is one of Russia's most important scholars and intellectual leaders in the fields of international relations and international security. He is the head of the Center for International Security of the Institute of World Economy and International Relations (IMEMO) of the Russian Academy of Sciences, and is also a Scholar-in-Residence and Co-chair of the Nonproliferation Program of the Carnegie Moscow Center.

Dr. Arbatov has also played a leading role in the politics of post-Soviet Russia, as a member of the Russian Parliament (Duma) from 1994 to 2003, and as vice chairman of the liberal YABLOKO Party from 2001 to the present. While in Parliament, he was deputy chairman of the Duma Defense Committee.

The author of numerous books and articles on global security, disarmament and Russian military reform, Dr. Arbatov is the vice-president of the Luxembourg Forum, a member of the Governing Board of the Stockholm International Peace Research Institute (SIPRI), the international advisory board of the Geneva Centre for the Democratic Control of Armed Forces (DCAF), and the board of the Center for Nonproliferation Studies of the Monterey Institute of International Studies.

SENATOR PETE DOMENICI



U.S. Senator Pete V. Domenici (R-New Mexico) is a strong proponent of creating and sustaining programs focused on reducing the threats from weapons of mass destruction.

As the Ranking Republican of the Senate Energy and Natural Resources Committee and the Senate Energy and Water Development Appropriations Subcommittee, he has promoted legislation to bolster U.S. efforts to prevent the proliferation of nuclear weapons and the components to build such weapons. He has worked in support of the evolving mission of the U.S. national laboratories and other high-technology research facilities.

Senator Domenici supports greater U.S. energy independence, encouraging the development of all domestic energy resources in order to reduce the country's reliance on foreign sources of energy. He has led national efforts to assure that nuclear energy, which now provides over one-fifth of our nation's electricity, remains a strong option for clean, reliable production. A 32-year veteran of the Senate Budget Committee, Senator Domenici is also recognized as one of the nation's foremost experts on the federal budget. In December 2005, he was awarded the French Nuclear Energy Society's Grande Medaille de l'Academie des Sciences, the most prestigious award offered by the society.

SUSAN EISENHOWER



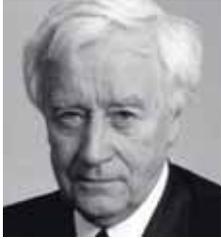
Susan Eisenhower, President of the Eisenhower Group, is best known for her work on U.S.-Russian relations and international security issues. She is a Distinguished Fellow of the Eisenhower Institute, where she served as both President and Chairman.

In the spring of 2000, Ms. Eisenhower was appointed by the U.S. Secretary of Energy to a blue ribbon task force, the Baker-Cutler Commission, to evaluate U.S.-funded nonproliferation programs in Russia, and since that time she has also served as an advisor to another U.S. Energy Department study. She also serves as an Academic Fellow of the International Peace and Security program of the Carnegie Corporation of New York. Ms. Eisenhower has received three honorary doctorates and a number of other awards for her work in U.S.-Russian relations.

Ms. Eisenhower has spent more than 20 years of her career on foreign policy issues, though she came to the field from the business community. A onetime consultant to IBM, American Express and Loral Space Systems, she was appointed in 1998 to the National Academy of Sciences' standing committee on international security and arms control.

Ms. Eisenhower is an author of two bestselling books, *Breaking Free* and *Mrs. Ike*. She has edited three collected volumes on regional security issues and written hundreds of op-eds and articles for major newspapers and other national publications. In addition to her membership on NTI's board, Ms. Eisenhower serves on a number of boards of corporations, private foundations and educational institutions.

AMBASSADOR ROLF EKÉUS



Ambassador Rolf Ekéus is Chairman of the Board of the Stockholm International Peace Research Institute. From 2001 to 2007, he has served as High Commissioner on National Minorities for the Organization for Security and Cooperation in Europe.

He has held a number of diplomatic posts, including Swedish Ambassador to the United States from 1997 to 2000 and head of the United Nations Special Commission on Iraq (UNSCOM).

In October 2000, the Swedish government appointed him as a special commissioner and asked him to carry out two investigations. One was to analyze and assess Sweden's security policy during the Cold War. The second was to investigate the political and military handling of foreign submarine intrusions into Swedish territorial waters from 1980 until the present.

Ambassador Ekéus has spent the last two decades working on international nonproliferation issues. From 1991 to 1997 he served as Executive Chairman of the United Nations Special Commission on Iraq. In that post, he was responsible for work to eliminate the Iraqi infrastructure for nuclear and other weapons of mass destruction. He served as Ambassador and Head of the Swedish delegation to the Conference on Security and Cooperation in Europe, as Permanent Representative of Sweden to the Conference on Disarmament 1983-1989 and as Chairman of the international negotiations on a Chemical Weapons Convention. He is a Member of the Board of Directors of the International Commission on Missing Persons. He also serves as Chairman of the Swedish Pugwash Network. He was a Member of the Advisory Board on Disarmament of the Secretary-General of the United Nations, the Canberra Commission on Nuclear Weapons and the Tokyo Forum on Disarmament.

His work in this field was recognized with the Waterlér Peace Prize from the Carnegie Foundation in 1997.

GENERAL EUGENE E. HABIGER



General Eugene E. Habiger (U.S. Air Force, Retired) has more than 35 years of experience in national security and nuclear operations. In his previous assignment as the Commander in Chief of United States Strategic Command, he was responsible for all U.S. Air Force and U.S. Navy strategic nuclear forces

supporting the national security strategy of strategic deterrence. In this position, he established an unprecedented military-to-military relationship with his Russian counterparts, which resulted in extraordinary confidence building and openness. This initiative was the centerpiece of a 60 Minutes II segment in February 2000 and a CNN special in October 2000.

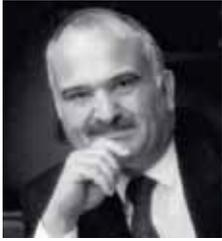
General Habiger is a Distinguished Fellow and Policy Adviser with the University of Georgia's Center for International Trade and Security where he assists with the Center's international programs aimed at preventing weapons proliferation and reducing nuclear dangers.

Prior to joining the Center, General Habiger was the President/CEO of the San Antonio Water System, where he was responsible for the general operations of the System along with the strategic long-range business and water resources planning for the ninth largest city in the United States.

He also worked as the Department of Energy's Director of Security and Emergency Operations. As the Department's "Security Czar," he was charged by the Secretary with changing the security culture at the Energy Department and establishing a program to reenergize and restore confidence in the Department's Security Program.

He is a command pilot with more than 5,000 flying hours, primarily in bomber aircraft. During the Vietnam War, he flew 150 combat missions. He is also the Chairman of the Board of the Armed Services YMCA, serves on the Fisher House Foundation of San Antonio and is a Senior Fellow with the Gorbachev Foundation.

HRH PRINCE EL HASSAN BIN TALAL



A pluralist, believing in consensus and respect for others, His Royal Highness Prince El Hassan bin Talal works to build societies in which all groups of people can live, work and function in freedom and with dignity. He recognizes that stability and security are predicated on ensuring that a universal standard

exists for protecting individuals' basic rights and well-being. In this context, he has worked to raise the voice of the "silenced majority," to build solidarity and civic affinity, and to promote democracy, pluralism and transparency through such initiatives as Voices from Asia and the Middle East Citizens' Assembly. He is also involved in humanitarian and interfaith issues, with a particular emphasis on the human dimension of conflicts.

His Royal Highness has initiated, founded and is actively involved in a number of Jordanian and international institutes and committees. He co-chaired the Independent Commission on International Humanitarian Issues in 1983, and is currently President and Patron of the Arab Thought Forum, President of the Club of Rome and President Emeritus of the World Conference on Religion and Peace.

His Royal Highness is the author of seven books: *A Study on Jerusalem* (1979); *Palestinian Self-Determination* (1981); *Search for Peace* (1984); *Christianity in the Arab World* (1994); *Continuity, Innovation and Change: Selected Essays* (2001); *In Memory of Faisal I: The Iraqi Question* (2003); and joint author of *To Be a Muslim* in the Italian and French languages (2001).

PIERRE LELLOUCHE



Pierre Lellouche has been a member of the French National Assembly since 1993 and served as President of the NATO Parliamentary Assembly. He is the National Secretary of his party (in charge of Defense), the Union Mouvement Populaire (UMP), and a practicing attorney with Clyde and Co., Paris.

From 1989 to 1995, he was Diplomatic Advisor to French President Jacques Chirac, and he has held a number of positions in his party on foreign affairs and defense issues.

Previously, Mr. Lellouche was a Co-founder and Deputy Director of the French Institute for International Affairs (IFRI). He has taught and published widely on political-military affairs, including serving as a columnist for *Le Point* and *Newsweek*.

He is a vice chairman of the Atlantic Partnership and a member of the Trilateral Commission and the Council of the International Institute for Strategic Studies. Mr. Lellouche also serves as a Member of the Board of Directors of the Foundation du Futur, and as a member of the editorial board of the *European Journal of International Affairs* and *Journal of Arms Control and Security Studies*.

Pierre Lellouche is the author of several books including: *Illusions Gauloises* (2006), *Le Nouveau Monde* (1992), *La République Immobile* (1998) and *La France et les Bombes* (2000). He was educated in Paris and at Harvard Law School, where he earned his masters and doctorate degrees.

SENATOR RICHARD G. LUGAR



U.S. Senator Richard G. Lugar (R-Indiana) is the Ranking Republican of the Senate Foreign Relations Committee and a well-known leader in international security issues. A proponent of free trade and economic growth, Senator Lugar was elected to the U.S. Senate in 1976 and won a sixth term in 2006 with 87 percent of the vote.

Senator Lugar has been instrumental in Senate ratification of treaties that reduce the world's use, production and stockpiling of nuclear, chemical and biological weapons. In 1991, he forged a bipartisan partnership with then-Senate Armed Services Chairman Sam Nunn to create a cooperative program to destroy weapons of mass destruction in the former Soviet Union. To date, the Nunn-Lugar program has deactivated more than 7,000 nuclear warheads that were once aimed at the United States.

As chairman of the Agriculture Committee, Senator Lugar built bipartisan support for 1996 federal farm program reforms, ending 1930s era federal production controls. He initiated a biofuels research program to help decrease U.S. dependency on foreign oil and led initiatives to streamline the U.S. Department of Agriculture, reform the food stamp program and preserve the federal school lunch program.

Combining his experiences on the Foreign Relations and Agriculture Committees and recognizing that energy security impacts every aspect of life in the United States, from the cars we drive and how much we pay at the gas pump to our vulnerability to foreign terrorism and our relationships with other countries, Senator Lugar has launched the Lugar Energy Initiative.

Senator Lugar has received numerous awards and 40 honorary degrees. In 2006, *Time* magazine listed Senator Lugar as one of the top 10 Senators. He manages his family's 604-acre Marion County corn, soybean and tree farm. Before entering public life, he helped run the family's food machinery manufacturing business in Indianapolis.

DR. JESSICA TUCHMAN MATHEWS



Dr. Jessica Tuchman Mathews is President of the Carnegie Endowment for International Peace, an international research organization with offices in Washington, DC, Moscow, Beijing, Beirut and Brussels. Dr. Mathews, who holds a PhD in molecular biology, has held positions in the executive and legislative branches, in management and research in the nonprofit arena and in journalism.

She was a Senior Fellow at the Council on Foreign Relations from 1993 to 1997 and served as Director of the Council's Washington program. During that time her Foreign Affairs article, "Power Shift", was chosen by the editors as one of the most influential in the journal's 75 years.

From 1982 to 1993, Dr. Mathews was founding Vice President and Director of Research of the World Resources Institute, an internationally known center for policy research on environmental and natural resource management issues.

She served on the editorial board of *The Washington Post* from 1980 to 1982, covering energy, environment, science, technology, health and arms control issues. Later, she became a weekly columnist for *The Washington Post*.

From 1977 to 1979, she was the Director of the Office of Global Issues of the National Security Council, covering nuclear proliferation, conventional arms sales policy, chemical and biological warfare and human rights. In 1993, she returned to government as Deputy to the Under Secretary of State for Global Affairs.

JUDGE HISASHI OWADA



Judge Hisashi Owada was appointed to the International Court of Justice in The Hague in early 2003. Before being appointed to this post, he served as President of the Japan Institute of International Affairs, Advisor to the Minister for Foreign Affairs of Japan, Senior Advisor to the President of the World Bank and Professor of Law and Organization at Waseda University Graduate School in Japan.

One of his country's most respected diplomats, Judge Owada previously served as Vice Minister for Foreign Affairs of Japan, Permanent Representative of Japan to the Organization for Economic Cooperation and Development in Paris and as Permanent Representative of Japan to the United Nations in New York.

In the academic field as a professor of international law and organization, Judge Owada has taught at Tokyo University since 1963, and at the law schools of Harvard University, Columbia University and New York University. He is a *membre* of the *Institut de Droit International* and a professor at Leiden University. Judge Owada is the author of numerous writings on international, legal and political affairs.

WILLIAM PERRY



William J. Perry, a senior fellow at the Hoover Institution, is the Michael and Barbara Berberian Professor at Stanford University, with a joint appointment in the School of Engineering and the Institute for International Studies, where he is co-director of the Preventive Defense Project, a research collaboration of Stanford and Harvard Universities. Previously he was a professor (halftime) at Stanford from 1988 to 1993, when he was the co-director of the Center for International Security and Arms Control. He was a part-time lecturer in the Department of Mathematics at Santa Clara University from 1971 to 1977.

Dr. Perry was the 19th United States Secretary of Defense (1994 to 1997). He was Deputy Secretary of Defense (1993–94) and Undersecretary of Defense for Research and Engineering (1977–81).

Dr. Perry's business experience includes serving as a laboratory director for General Telephone and Electronics (1954–64); founding and serving as the president of ESL (1964–77); executive vice-president of Hambrecht & Quist (1981–85); and founding and serving as the chairman of Technology Strategies and Alliances (1985–93). He serves on the board of directors of Anteon International Corporation and several emerging high-tech companies and is chairman of Global Technology Partners.

Dr. Perry received his B.S. and M.S. degrees from Stanford University and his Ph.D. from Pennsylvania State, all in mathematics. He is a member of the National Academy of Engineering and a fellow of the American Academy of Arts and Sciences. From 1946 to 1947, Perry was an enlisted man in the Army Corps of Engineers and served in the Army of Occupation in Japan. He joined the Reserve Officer Training Corps in 1948 and was a second lieutenant in the Army Reserves from 1950 to 1955.

Perry has received numerous awards and decorations from U.S. and foreign governments, nongovernmental organizations and the military, including the Presidential Medal of Honor in 1997.

DR. NAFIS SADIK



Dr. Nafis Sadik has consistently called attention to the importance of addressing the needs of women directly in making and carrying out development policy. From April 1987 to December 2000, Dr. Sadik served as Executive Director of the United Nations Population Fund (UNFPA), with the rank of

Under Secretary General, becoming the first woman to head a major UN voluntarily funded program. In 2001, Dr. Sadik was appointed as Special Adviser to the UN Secretary-General, where she continues to work on gender, population and development issues.

Dr. Sadik came to the United Nations after a distinguished career in Pakistan, where she served as Director-General of the Central Family Planning Council. Since beginning her career as a physician in 1954, Dr. Sadik has taken on a number of increasingly challenging leadership roles in the family planning field. She first served as a civilian medical officer in charge of women's and children's wards in various Pakistani armed forces hospitals before directing hospitals and eventually heading the Planning and Training Division, the government agency charged with national family planning program.

Dr. Sadik was educated at Loreto College, Calcutta, India; received a doctor of medicine degree from Dow Medical College, Karachi, Pakistan; and completed further studies at Johns Hopkins University. She is the recipient of numerous international awards and honors for her contributions to improving the health of women and children of the global community.

PROFESSOR AMARTYA SEN



Amartya Sen is a world-renowned economist, scholar, philosopher and author. He has done groundbreaking research in a number of areas, including social choice theory, political and moral philosophy and decision theory. Awarded the "Bharat Ratna," the highest honor given by the President of India, Profes-

sor Sen's work in economics has also been recognized with a Nobel Prize.

Professor Sen is Lamont University Professor and Professor of Economics and Philosophy at Harvard University. Until recently he was Master of Trinity College, Cambridge. Earlier, he was the Drummond Professor of Political Economy at Oxford University and a Fellow of All Souls College. Prior to that he was Professor of Economics at Delhi University and at the London School of Economics.

Professor Sen has researched and written books in a number of wide-ranging fields, including economics, philosophy, decision theory and social choice theory. His work has covered welfare economics, theory of measurement, development economics, moral and political philosophy and the economics of peace and war. Professor Sen's books, which have been translated into many languages, include *The Argumentative Indian*; *Identity and Violence: The Illusion of Destiny*; *Rationality and Freedom*; *Collective Choice and Social Welfare*; *On Economic Inequality*; *Poverty and Famines*; *Choice, Welfare and Measurement*; *Resources, Values and Development*; *On Ethics and Economics*; *The Standard of Living*; *Inequality Reexamined* and *Development as Freedom*.

Born in Santiniketan, India in 1933, Professor Sen studied at Presidency College in Calcutta, India, and at Trinity College, Cambridge. He is an Indian citizen.

RT. HON. PROFESSOR SHIRLEY WILLIAMS



Rt. Hon. Professor Shirley Williams is a Member of the House of Lords, where she was Leader of the Liberal Democrats from 2001 to 2004, and is one of its most respected speakers on foreign affairs.

She began her career as a journalist for *The Daily Mirror* and *The Financial Times* and in 1960 became

Secretary of the Fabian Society. Earlier in her career, she was a Member of the House of Commons and served as a Labour cabinet minister of Education and Science.

Outside her career in government, Baroness Williams served as Public Service Professor of Elective Politics from 1988-2000 at the John F. Kennedy School of Government at Harvard University. She lectured at numerous universities including Princeton University, University of California at Berkeley and Cambridge University. She is a member of the Council on Foreign Relations International and serves on several other boards, including the Moscow School of Political Studies and the International Crisis Group.

Baroness Williams holds 11 honorary doctorates from British, Belgian and U.S. universities. She received a BA in philosophy, politics and economics from Somerville College, where she also received an MA, and attended Columbia University on a Fulbright Scholarship.

In 2007 she became an advisor to the British government on nonproliferation issues.

PROFESSOR FUJIA YANG



Professor Fujia Yang, academician of the Chinese Academy of Sciences, is an internationally renowned nuclear physicist who currently serves as the sixth Chancellor of the University of Nottingham, one of the United Kingdom's leading research universities, and the Vice Chairman of the Chinese Association

for Science & Technology.

Born in Shanghai, Professor Yang graduated from Fudan University in 1958 with a degree in physics. He went from his initial appointment as a Teaching Assistant, to a Professorial Chair in Physics, to the Presidency of the University of Fudan from 1993-1999. He served as Director of the Shanghai Institute of Nuclear Research of the Chinese Academy of Sciences from 1987-2001, was Chairman of the Shanghai Science and Technology Association from 1992-1996 and was the founding president of the Association of University Presidents of China from 1997 to 1999.

Dr. Yang's work has taken him to positions around the globe, including visiting professorships at the Neils Bohr Institute in Copenhagen, Denmark; State University of New York at Stony Brook, USA; Rutgers University, New Jersey, USA; and Tokyo University, Japan.

Professor Yang served as a council member representing China on the Association of East Asia Research Universities, was a member of the International Association of University Presidents and of the Association of University Presidents of the Pacific Rim. He holds honorary degrees from Soka University, Tokyo, Japan; the State University of New York; the University of Hong Kong; the University of Nottingham; and the University of Connecticut.

ADVISORS TO THE BOARD OF DIRECTORS

WARREN E. BUFFETT



Warren E. Buffett, who has been concerned about the threats from weapons of mass destruction for four decades, serves as an Advisor to NTI's Board of Directors.

Mr. Buffett is Chairman of the Board and Chief Executive Officer of Berkshire Hathaway Inc., a holding company owning subsidiaries engaged in a number of diverse business activities and controlled by him since 1965. Berkshire Hathaway Inc.'s business activities include the underwriting of property and casualty insurance and a wide variety of manufacturing, retailing and service companies.

Mr. Buffett started out as an investment salesman and securities analyst, and early in his career he created his own investment partnership.

Mr. Buffett also serves as a Director of The Washington Post Company and is a life trustee of Grinnell College and The Urban Institute. Mr. Buffett attended the Woodrow Wilson High School in Washington, DC, the Wharton School of Business at University of Pennsylvania and in 1950 received his B.S. from the University of Nebraska. He earned his M.S. in Economics from Columbia University in 1951.

DAVID A. HAMBURG



David A. Hamburg is DeWitt Wallace Distinguished Scholar at Weill Cornell Medical College. He is president emeritus at Carnegie Corporation of New York, where he served as president from 1982 to 1997. A medical doctor, Hamburg has a long history of leadership in the research, medical, and psychiatric fields.

He has been a professor at Stanford University and Harvard University, as well as President of the Institute of Medicine, National Academy of Sciences.

He was a member of the U.S. Defense Policy Board and co-chair with former Secretary of State Cyrus Vance of the Carnegie Commission on Preventing Deadly Conflict. The Commission published many books and monographs in its five-year life (1994-99), covering diplomatic, political, economic and military aspects of prevention. Distinguished scholars and practitioners contributed on a worldwide basis.

He was a member of President Clinton's Committee of Advisors on Science and Technology. Most recently, Dr. Hamburg chaired two parallel committees at the United Nations and European Union on the prevention of genocide—one reporting directly to the UN Secretary-General and the other to Javier Solana.

Dr. Hamburg also serves on the Advisory Board of the Center for Preventive Action of the Council on Foreign Relations, the Advisory Council of Stanford's Freeman Spogli Institute of International Studies, the Harvard International Advisory Council and is Distinguished Presidential Adviser on International Affairs, National Academy of Sciences. He is the author of *Today's Children: Creating a Future for a Generation in Crisis* (1992); *No More Killing Fields* (2002); and *Learning to Live Together* (2004). His current book, *Preventing Genocide: Practical Steps toward Early Detection and Effective Action* will be published in spring 2008.

SIEGFRIED S. HECKER



Siegfried S. Hecker is co-director of the Stanford University Center for International Security and Cooperation, Senior Fellow of the Freeman Spogli Institute for International Studies, and Professor (Research) in the Department of Management Science and Engineering. He is also director emeritus at the Los Alamos National Laboratory/University of California, where he served as director from 1986-1997 and senior fellow until July 2005. He received his B.S., M.S., and PhD degrees in metallurgy from Case Western Reserve University. His current professional interests include plutonium research, nuclear weapons policy, cooperative nuclear threat reduction, and global nonproliferation and counterterrorism. He is a member of the National Academy of Engineering and serves as a Councilor, is chair of the Joint U.S./Russian Academies Committee on Counterterrorism Challenges in Russia and the United States, and serves on the National Academy of Sciences Committee on International Security and Cooperation Nonproliferation Panel. He is a foreign member of the Russian Academy of Sciences. He is also a member of the Council on Foreign Relations, fellow of the American Academy of Arts and Sciences, the American Association for the Advancement of Science, The Metallurgical Society, ASM International, and an Honorary Member of the American Ceramics Society. He serves as an advisor to the Civilian Research and Development Foundation.

FREDERICK ISEMAN



Frederick Iseman is the Chairman and Managing Partner of Caxton-Iseman Capital Inc., which he founded in 1993 in partnership with Caxton Associates.

Caxton-Iseman's companies currently have combined sales of \$5 billion, cash flow of \$550 million, and approximately 75,000 employees. Mr. Iseman is chairman of Caxton-Iseman's portfolio companies: Ply Gem Industries (housing components), Buffets, Inc. (restaurants), Valley National Gases (industrial gas distribution), Prodigy Health Group (health care services), American Residential Services (heating and ventilation), Electrograph Systems (flat screen media), and CoVant (federal information technology). He is also a member of the Advisory Board of investment firm STAR Capital in London.

In addition, Mr. Iseman is a Board member of the International Rescue Committee and the Academy for Educational Development, and a member of the International Council of the Belfer Center for Science and International Affairs (John F. Kennedy School of Government, Harvard University). Mr. Iseman is a major supporter of the Yale Center for Genocide Studies and Stanford University's Preventive Defense Fund. He is also a Harold Pratt Fellow of the Council on Foreign Relations.

Mr. Iseman is on the Board of Directors of the New York City Opera and the Glimmerglass Opera. He is a major supporter of medical research at Columbia-Presbyterian Medical Center, including the Wharton Institute, the Taub Institute for Brain Research and other disciplines, including cancer research and immunology. He has published articles in *The New York Times*, *Harper's Magazine* and *The New Yorker*. Mr. Iseman has a B.A. in English Literature from Yale College (1974), where he is a member of the Elizabethan Club. He resides in New York with his two children.

GEORGE F. RUSSELL, JR.



Mr. Russell built the Frank Russell Company from one part-time secretary in 1958 to become one of the world's leading investment advisory firms. He served as chairman from 1958 until the firm was sold to Northwestern Mutual Life in 1999. Today, the company guides over 1,900 clients in 44 countries with assets exceeding more than \$2.4 trillion, and manages \$171 billion in funds. The company is often recognized by the stock market index The Russell 2000.

Internationally known as an advocate for narrowing the gap between the "haves" and the "have nots", Mr. Russell has a focus on a number of challenges: the promotion of globalization, the destruction of nuclear waste, strengthening U.S.-Russian relations, ground-level humanitarian projects and bridging the current divide between Muslims and non-Muslims in America.

Currently, Mr. Russell is Chairman of the EastWest Institute, One Nation, a project working to change the perceptions of Islam and Muslims in America, The National Bureau of Asian Research, The Pacific Health Summit, Nuclear Fuel Cycle Technologies, Inc., The Russell Family Foundation, Threshold Group, and Honorary Co-Chairman of the Business Humanitarian Forum.

IN MEMORIAM



JOSHUA LEDERBERG

NTI is saddened by the loss of Joshua Lederberg, an advisor to the NTI Board of Directors, who died on Feb. 2, 2008. Dr. Lederberg, known for his pioneering work in the fields of bacterial genetics,

biotechnology, artificial intelligence and space exploration, helped guide the direction of NTI's biological programs.

Dr. Lederberg's scientific achievements were extraordinary and of global significance. Perhaps less widely known were his abilities to connect the implications of advances in the life sciences to national and international security. He was extremely influential in this field, working with governments and academic institutions worldwide.

Dr. Lederberg's analytical powers were outstanding, and combined with his ability to explain lucidly complex scientific issues to many high-level officials grappling with difficult policy decisions, made his contributions all the more important and effective.

He won the Nobel Prize for Medicine in 1958 at the age of 33 sharing the prize with two other geneticists for discovering that bacteria can mate and exchange genes.

Dr. Lederberg was the President of Rockefeller University from 1978 to 1990, and was President Emeritus at the time of his death. He also continued his lifelong research on bacterial genetics.

Dr. Lederberg served on the Defense Science Board and the Defense Threat Reduction Agency advisory committee, as well as a range of other governmental, industrial and academic consultantships. He was awarded the U.S. National Medal of Science in 1989 and the Presidential Medal of Freedom in 2006.

OFFICERS & STAFF

Sam Nunn

*Co-Chairman & Chief Executive Officer
(see biography in Board of Directors section)*

Charles B. Curtis

*President & Chief Operating Officer
(see biography in Board of Directors section)*

Joan Rohlfig

Senior Vice President for Programs & Operations

Ms. Rohlfig joined NTI after spending six years in a number of senior positions with the U.S. Department of Energy. She served as Senior Advisor for National Security to the Secretary of Energy and Director of the Office of Nonproliferation and National Security. She took a nine-month assignment in New Delhi, India, in the wake of nuclear tests in South Asia, to advise the U.S. Ambassador on nuclear security issues. Ms. Rohlfig also has served on the staff of the U.S. House Armed Services Committee and at the U.S. Department of Defense.

Brooke D. Anderson

Vice President for Communications

Ms. Anderson joined NTI after serving in various senior positions in the executive and legislative branches of the U.S. government, including Special Assistant to the President and Senior Director for Communications at the National Security Council at the White House. She also served as Director of the U.S. Depart-

ment of Energy's Office of Public Affairs and Deputy Chief of Staff and Press Secretary to former Congressman David Skaggs.

Charlotte S. Atkinson, ACA, CPA

Controller

Ms. Atkinson joined NTI from Deloitte, where she was an Audit Senior Manager. She has more than eight years experience auditing not-for-profits, financial services and service organizations. Ms. Atkinson is a Certified Public Accountant and a member of the American Institute of Certified Public Accountants. She is also a Chartered Accountant and a member of the Institute of Chartered Accountants in England and Wales. She holds a BSc(Hons) in Physics from the University of Bristol, and a Masters degree in International Studies from the University of Birmingham, UK.

Kraig M. Butrum

Vice President for Development

Mr. Butrum has more than 20 years of fundraising experience, has held senior-level development positions with a number of non-profit organizations and has consulted internationally on nonprofit fundraising. His fundraising experience includes major capital campaigns, including directing Conservation International's five-year \$600 million Campaign to Save the Hotspots and the National Park Foundation's Connecting Our Children to America campaign.

Laura S.H. Holgate

Vice President for Russia/New Independent States (NIS) Programs

Ms. Holgate joined NTI after serving in a number of senior positions in the federal government. She managed the Nunn-Lugar Cooperative Threat Reduction program at the U.S. Department of Defense, which provides assistance to Russia and the New Independent States in securing and destroying excess nuclear, chemical and biological weapons and materials. She also served as Director of the Office of Fissile Materials Disposition at the U.S. Department of Energy. Ms. Holgate has received numerous public service awards and is a member of the Council on Foreign Relations and the International Institute of Strategic Studies. She is President of Women in International Security, and sits on advisory panels of the Pacific Northwest National Laboratory and the Oak Ridge National Laboratory.

Lisa K. Cutler

Director of Programs and Outreach

Prior to joining NTI, Ms. Cutler directed external communications for the U.S. National Nuclear Security Administration. She has also held senior communications positions at the U.S. Department of Energy and the U.S. Department of Labor and was Press Secretary to former U.S. Senators John Glenn and Harris Wofford.

Terence Taylor

Director, Global Health and Security Initiative

He has held leadership positions at The International Institute for Strategic Studies (IISS), the United Kingdom's Ministry of Defense and the United Nations. Mr. Taylor established the U.S. office of the IISS and served as its first President and Executive Director for 5 years. He was a career officer in the British army with experience in many parts of the world including UN peacekeeping and counterterrorist operations. He is an expert on the impact of advances in science and technology on international security policy, with a special emphasis in risk assessment and nonproliferation. He is a former Science Fellow at Stanford University's Center for International Security and Cooperation. Mr. Taylor is also the President and Director of the International Council for the Life Sciences (ICLS).

Robert E. Berls, Jr., PhD

*Senior Advisor for Russia/NIS Programs,
Director of the Moscow Office*

Dr. Berls brings to NTI a background in Soviet/Russian energy and nuclear weapons issues. As a Colonel in the U.S. Air Force, he served as Air Attaché at the U.S. Embassy in the 1980s. During the Clinton Administration he was Special Assistant to the Secretary of Energy for Russia/NIS Programs. Before joining NTI, he was Vice President for Business Development and Government Relations for a U.S. oil company.

Louise S. Gresham, PhD, MPH

*Assistant Director, Science and Technology,
Global Health and Security Initiative*

Dr. Gresham previously served as the Senior Epidemiologist for San Diego County, Health and Human Services Agency with over 20 years of experience conducting and supervising infectious disease surveillance and response activities. Before coming to NTI, she was the Director of the San Diego State University Center for Public Health Security. Dr. Gresham brings expertise in national and international disease surveillance systems, including the U.S. Mexico Border Infectious Disease Surveillance program and the Middle East Consortium on Infectious Disease Surveillance. Dr. Gresham is well published and is an Associate Research Professor of Public Health at San Diego State University and co-founder of the Global Emergency Preparedness and Response Master of Science.

Catherine O'Brien Gwin

Director of Communications

Ms. Gwin came to NTI from the law firm of King & Spalding, where she served as former Senator Sam Nunn's Director of Communications and Public Policy. She previously served as Senator Nunn's Press Secretary in the U.S. Senate and the spokesperson for the Senate Armed Services Committee.

Margaret A. Hamburg, M.D.*Senior Scientist*

Dr. Hamburg previously served as NTI's Vice President for the Biological Program and now provides strategic advice and expertise to NTI as Senior Scientist. Before coming to NTI, Dr. Hamburg was Assistant Secretary for Planning and Evaluation at the U.S. Department of Health and Human Services. She is a physician and expert in public health and bioterrorism. Dr. Hamburg was the Commissioner of Health for the City of New York and former Assistant Director of the Institute of Allergy & Infectious Diseases at the National Institutes of Health. She is a member of the Institute of Medicine of the National Academies of Science, the Intelligence Science Board, the Council on Foreign Relations, the Aspen Study Group and is a fellow for the American Association of the Advancement of Science. She also serves on the Board of Trustees of the Rockefeller Foundation.

Diane G. Hauslein*Director of Administration*

Ms. Hauslein joined NTI following a 21-year career in the field of legal management, including finance, human resources, facilities/equipment management, technology and marketing. Most recently, Ms. Hauslein served as the Director of Administration for the Washington, DC office of an international law firm co-managed by James Hall, former Chairman of the National Transportation Safety Board.

Corey Hinderstein*Director, International Program*

Ms. Hinderstein came to NTI in 2006 from the Institute for Science and International Security (ISIS), where she was the Deputy Director of the Institute. Her research has focused on the intersection of technical and policy issues related to the dangers posed by nuclear proliferation. Ms. Hinderstein is a Phi Beta Kappa graduate of Clark University and is President of the Northeast Region of the Institute of Nuclear Materials Management.

Alexander Nikitin*Webmaster*

Prior to joining NTI, Mr. Nikitin pursued a PhD in Comparative Literature at Stanford University. Previously, Mr. Nikitin held teaching positions at Monterey Institute of International Studies and Carnegie Mellon University. Mr. Nikitin grew up in Russia and received his undergraduate education at Moscow State University and later at Dartmouth College. He has a Bachelor of Arts from Dartmouth College. Mr. Nikitin is fluent in English and Russian, and proficient in French and Italian.

Tatiana G. Nikolenko*Program Manager, Biological Programs in Russia, Moscow Office*

Prior to joining NTI, Ms. Nikolenko worked as a senior project manager at the International Science and Technology Center (ISTC) headquarters where she ran the Russian/NIS biological programs and served as coordinator for the U.S. public health programs in Russia and the NIS. Ms. Nikolenko received her degree in Biomechanics from Moscow State University. She has authored three books.

Mariah Richardson*Program Associate, Global Health and Security Initiative*

Ms. Richardson holds a Bachelor of Arts in Philosophy and Policy Journalism from Duke University, and has worked as a writer and research assistant in the global health arena. Ms. Richardson also serves on the advisory board of a non-profit health and education organization based in East Africa, providing guidance on program strategy and fundraising.

Jennifer Runyon

Senior Program Officer, GHSI

Jennifer Runyon is also the Assistant Director for the ICLS. Ms. Runyon holds a B.S. in Chemistry and Economics from Roanoke College and an M.A. in International Science and Technology Policy from The George Washington University. She has experience in program management and analytical work in the field of science, technology and non-proliferation policy.

Major Robert E. Schultz, USAF (Ret.) PMP

Senior Program Officer, Russia/NIS Programs

Major Schultz joined NTI after a military career in strategic nuclear operations and strategic offensive arms threat reduction. He brings extensive program implementation experience from the U.S. Department of Defense's Nunn-Lugar Cooperative Threat Reduction program where he was involved in the disposition of Russian strategic missiles. He also served as a Minuteman ICBM Flight Commander and as an Operations Planner on the Strategic Air Command's Airborne Command Post "Looking Glass." Major Schultz is a certified Project Management Professional and holds a Master's Certificate in Applied Project Management from Villanova University.

Kirsten Tallon

Development Associate

Ms. Tallon joined NTI after managing a private art collection in New York. While working at NTI, she earned a Masters degree in International Peace and Conflict Resolution at The School of International Service of American University. Ms. Tallon has a Bachelor of Arts in French from Dickinson College and is a member of Women in International Security.

Isabelle Williams

Program Officer, International Program

Ms. Williams came to NTI in 2007 from the Partnership for Global Security, where she managed the next generation non-proliferation program. She was previously a research associate at the Chemical and Biological Arms Control Institute and held successive positions at the International Institute for Strategic Studies in London.

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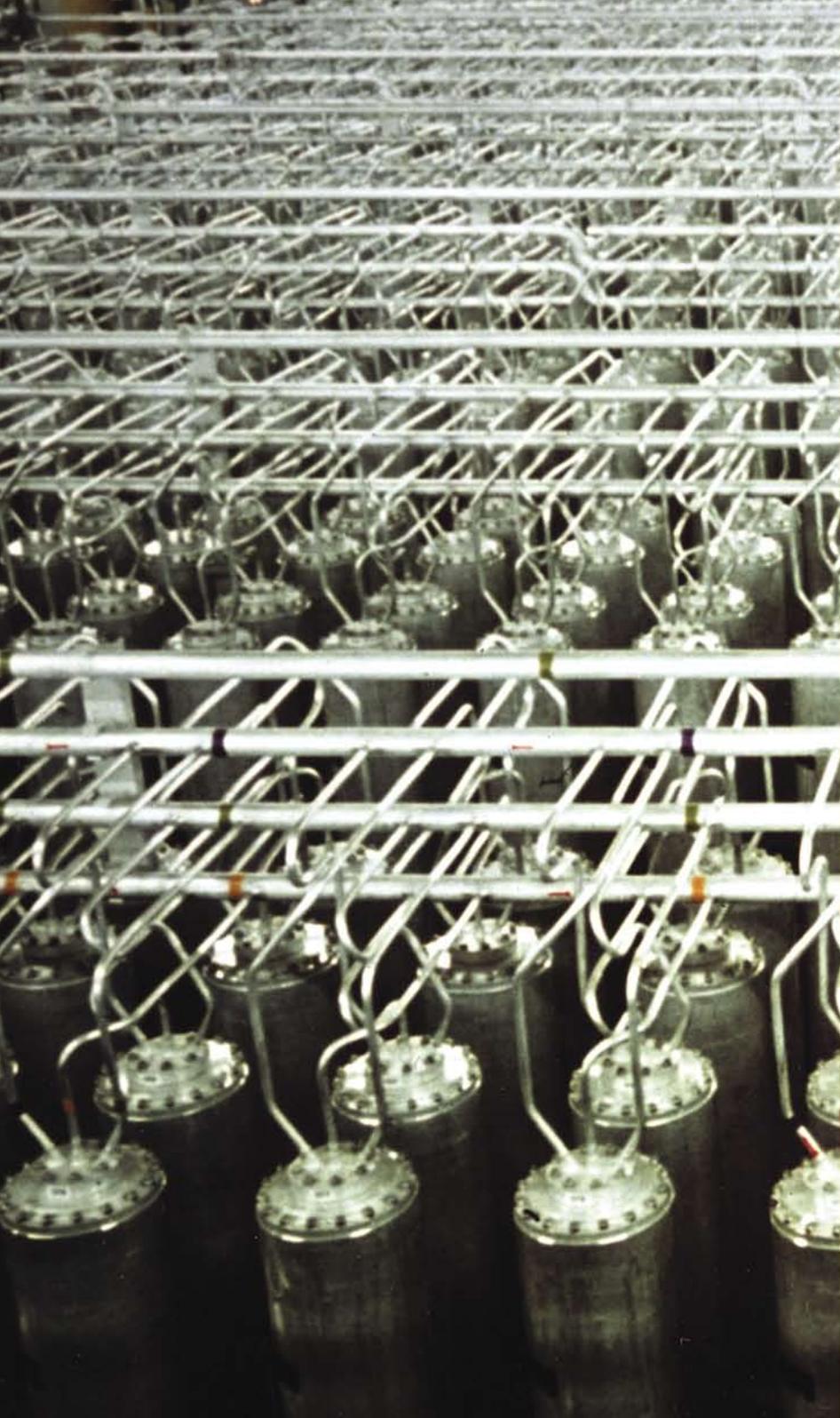
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