



BUILDING A SAFER WORLD

2018 ANNUAL REPORT



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LETTER FROM THE NTI CO-CHAIRS

# Ernest J. Moniz, Sam Nunn, and Ted Turner



A half-century ago, the Treaty on the Nonproliferation of Nuclear Weapons (NPT) opened for signature, heralding a global consensus on the dangers of nuclear weapons and laying the foundation for efforts to curb their spread.

Today, as the world prepares in 2020 to mark the 50th anniversary of the NPT's entry into force, a number of alarming developments signal a dangerous retreat from the commitment by the world's major nuclear-weapons states to take important steps to build a safer world. Among them: the U.S. withdrawal from the multilateral 2015 Iran nuclear deal and, in response to Russia's violations, the 1987 Intermediate-Range Nuclear Forces (INF) Treaty.

Add to that U.S. and Russian plans to deploy new nuclear weapons, expanding cyber threats, and the ever-expanding threat posed by terrorist organizations with nuclear technology know-how, and the backdrop for our work at the Nuclear Threat Initiative is as complex and challenging—and as urgent—as it has been since our founding in 2001.

We can report that NTI is fighting against these headwinds, globally and here in the United States, with an exceptional team that can turn innovative ideas into practice, unparalleled convening authority, and a well-deserved reputation globally as an independent, trusted, pragmatic partner. NTI is uniquely equipped to lead the way on important, measurable progress in the security arena. We know it's possible. We've done it again and again.



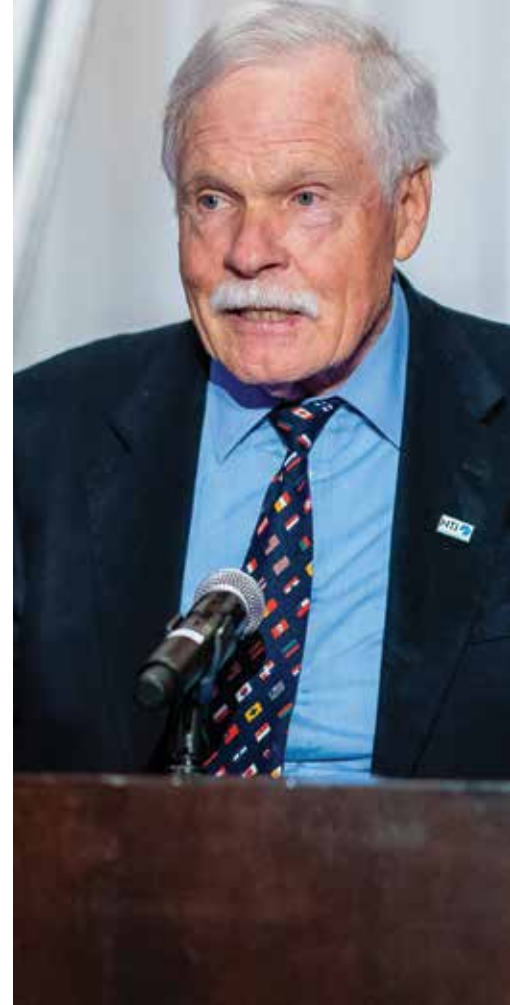
In these pages, you'll read about our latest work with governments and industry to prevent nuclear terrorism by enhancing the security around vulnerable nuclear materials and by protecting nuclear-weapons systems from cyberattacks. You'll learn how we use our influence and ideas to promote important collaboration between the United States and Russia on existential common interests to ensure the world's nuclear superpowers fulfill their obligation to reduce nuclear risks and prevent nuclear blunder. You'll read about how we're expanding our successful work to eliminate radioactive sources in the United States so that no city in the world finds itself struggling in the terror and destruction following a radioactive dirty bomb attack.

That is just a sample of our work in 2018. This also has been a year of major investment by NTI in enhancing global biosecurity. With transformational support from the Open Philanthropy Project, our trailblazing NTI | bio team is raising the profile of biosecurity in global health forums, identifying gaps in countries' capacity to mitigate the effects of a high-consequence biological event, identifying steps to reduce risks associated with advances in technology, and more. In 2019, we look forward to releasing the first Global Health Security Index with additional support from the Government of Canada. We intend for it to be as useful a tool for governments and experts as our NTI Nuclear Security Index has proven to be.

NTI's expertise and exceptional leadership has always been key to our success, and we are pleased to have been recognized by Women in International Security in 2018 as one of just three Washington "think tanks" to have reached gender parity among our experts. NTI has benefitted from talented women in leadership positions on our staff and board since our founding, but we know there is always work to do to encourage a diversity of voices and break down gender barriers in international security. That's why Ernie and Joan Rohlfing recently joined the new Gender Champions in Nuclear Policy initiative, committing to always work to enhance gender diversity across our activities and organization.

We have good news to report on that front. We are delighted that Elizabeth Sherwood-Randall and Nathalie Tocci—two highly respected leaders in global security—joined our Board this year. We also welcomed Admiral Mike Mullen, former Chairman of the Joint Chiefs of Staff, a bold and original thinker who energizes the room every time he walks in. We're honored that these exceptional leaders have committed their time and wisdom to NTI.

We've also made some high-profile additions to our staff this year. Laura S.H. Holgate, former U.S. Ambassador to the Vienna Office of the United Nations and the International Atomic Energy Agency, returned to NTI as vice president of our Materials Risk Management program after a number of years in government service; Peggy Knudson joined us as chief development officer; Richard Johnson



*In 2018, NTI named our new boardroom in honor of NTI founder and Co-Chair Ted Turner.*

came on board from the State Department as a senior director in NTI's International Fuel Cycle Strategies program; and Jake Jordan, an expert in emerging biotechnologies and national security, joined as a senior director for Global Biological Policy and Programs. Lynn Rusten, a former member of the White House National Security Council staff, was named vice president of the Global Nuclear Policy Program.

NTI also named the first Sam Nunn Distinguished Fellow in 2018. Jill Hruby, former director of Sandia National Laboratories, is spending one year at NTI working at the intersection of technology and security.

Jill recently drew a big crowd to NTI's new Seminar Series, where she described how the U.S. national laboratories conduct the annual assessment of the nuclear weapons stockpile. Thanks to our new office space, NTI is better able to host events and contribute to dialogue in the Washington policy community. Our new Seminar Series, initiated by Ernie in the spring, fosters new and creative thinking and discussion on issues related to weapons of mass destruction and disruption. The popular series has featured a range of speakers and topics, from *New York Times* journalist and author David Sanger on cyber risks to Stanford University's Siegfried S. Hecker on North Korea's nuclear program to noted biologist and innovator Dr. Reshma Shetty on biosecurity risks in the era of synthetic biology. Our seminars are open and on-the-record, and we encourage you to let us know if you'd like to be on the invitation list.

Without the support of the foundations, families, and individuals who put their faith in NTI, we would not be able to do the important work of global threat reduction. We are tremendously grateful to our new funders and to our steadfast supporters, particularly Warren Buffett, Carnegie Corporation of New York, the John D. and Catherine T. MacArthur Foundation, the Open Philanthropy Project, the Peter G. Peterson Foundation, and the Robertson Foundation.

We were deeply saddened by the passing of Pete Peterson this year. A true American hero, Pete was a visionary business leader and public servant. We are honored that his son, Michael A. Peterson, is an active and leading member of our Board.

Last, on a personal note, we celebrated a couple of important milestones this year, as Sam and Ted turned 80. The two of us want you to know that we entered our ninth decades on earth with as much energy and commitment to building a safer world as ever!



*Former U.S. Secretary of Energy Ernest J. Moniz joined NTI as co-chair and CEO in 2017.*

Ernest J. Moniz

Sam Nunn

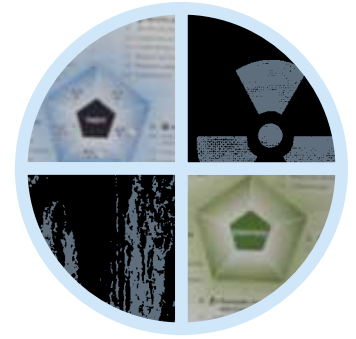
Ted Turner



*Sam Nunn spoke at the release of the 2018 NTI Nuclear Security Index.*



# Addressing Nuclear Terrorism



A terrorist nuclear attack—a “nuclear 9/11” —would be catastrophic, and the consequences would reverberate around the globe: hundreds of thousands of casualties, disruptions to markets and commerce, long-term implications for public health and the environment, and profound risks to our way of life. That’s why preventing nuclear terrorism has been at the heart of NTI’s work since our founding. Through partnerships with governments, industry, and civil society, NTI helps foster innovation, facilitate dialogue, and engender action to strengthen nuclear security worldwide.

## **NTI Nuclear Security Index**

The NTI Nuclear Security Index, the premier public resource for assessing nuclear security conditions across 176 countries, continues to guide governments, international organizations, and industry on the important steps needed to protect vulnerable nuclear materials and facilities from potentially catastrophic terrorism. The fourth edition, released in 2018, found that important progress to protect against catastrophic nuclear terrorism is jeopardized by a deterioration of political stability and governance around the world, and the expanding presence of terrorist groups in countries with nuclear materials or nuclear power plants. In addition, the 2018 Index found that many countries remain poorly prepared to defend against rapidly expanding and evolving cyber threats to nuclear facilities.

There was good news, too. As a *Washington Post* editorial on the Index put it, “The report shows that, though the last nuclear security summit was two years ago, nations are continuing to work toward properly securing fissile material and vulnerable nuclear sites.”

The NTI Index serves as a guidepost—and the next edition will be released in 2020.

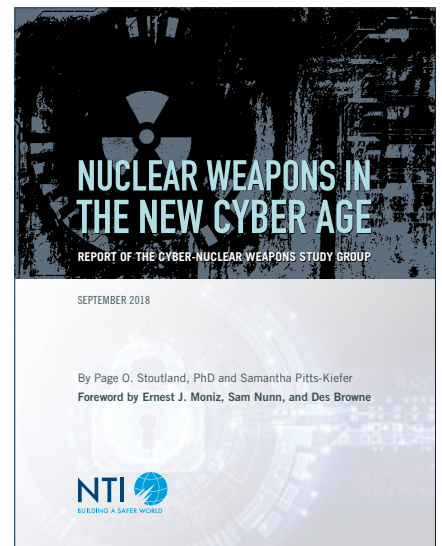
## Nuclear Weapons in the New Cyber Age

Cyber-based threats target all sectors of society—from the financial sector to the entertainment industry, from department stores to insurance companies—sometimes with devastating consequences. Imagine the consequences of a successful cyberattack on a nuclear weapon or related system. Imagine an attack that resulted in a false warning of an incoming nuclear attack or even allowed an adversary to take control of a nuclear weapon.

In 2016 NTI convened a Cyber-Nuclear Weapons Study Group of some of the most highly respected civilian and military leaders in the field to assess vulnerabilities and develop policy recommendations to address this existential risk. In 2018, NTI released the group’s report, *Nuclear Weapons in the New Cyber Age*, focusing on needed changes to U.S. nuclear policy and posture. Future work will address vulnerabilities in other countries because, as the report says, “All countries with nuclear weapons and facilities must do more—much more—to protect their nuclear weapons and related systems. A weak link anywhere can result in catastrophe.”

## World Institute for Nuclear Security Celebrates Its 10th Anniversary

Ten years ago, NTI helped conceive and create the World Institute for Nuclear Security (WINS), a first-of-its-kind organization to bring together nuclear security experts, the nuclear industry, governments, and international organizations to focus on rapid and sustainable improvement of security around the world. Today, WINS is an independent organization with more than 5,000 members from 139 countries who share best practices for nuclear security and work together to prevent nuclear terrorism. It has established the world’s first training academy for nuclear security professionals, with more than 1,000 enrolled. It has hosted workshops in 23 countries, attended by more than 3,300 participants, and published 36 international best-practice guides. And in a survey in 2017, 80 percent of WINS members said they have modified and improved their security practices because of WINS. As Sam Nunn said at WINS’ 10th anniversary celebration, “Bottom line: WINS has done exactly what it was set up to do—and much more.”



NTI’s Samantha Neakrase discussed NTI’s report, *Nuclear Weapons in the New Cyber Age*.

“Until now, people have thought about cybersecurity and nuclear weapons in silos, and this is the first time I’ve seen work that crosses that boundary and puts the two of them together.”

—**Richard Clarke**, former National Coordinator for Security, Infrastructure Protection, and Counter-Terrorism





(Photo: Creative Santa Fe)

## Moniz Discusses Future of Nuclear Weapons at Santa Fe Opera

Bringing nuclear security issues and NTI's work to new audiences—college students, young professionals, the faith community, business innovators, and artists—has been part of NTI's mission from the start. That's why CEO Ernie Moniz joined internationally acclaimed director and librettist Peter Sellars and choreographer Emily Johnson of the Santa Fe Opera's production of *Doctor Atomic* for a panel discussion about the future of nuclear weapons. Hosted by Santa Fe Opera and Creative Santa Fe, the July event was moderated by former broadcast journalist Sam Donaldson and covered the complex history of nuclear weapons in New Mexico, as well as today's proliferation challenges.



BY HARRY

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KOREAN CENTRAL NEWS AGENCY/AGENCE FRANCE PRESSE/GETTY

North Korean leader Kim Jong Un in Pyongyang last September.

# What to do if the talks with North Korea succeed

BY SAM NUNN  
AND RICHARD LUGAR

**A**s the United States prepares for historic discussions between President Trump and North Korean leader Kim Jong Un, the Trump administration and its international partners have a lot to think about. A success-ful outcome, if achieved, will have long and far-reaching implications for the region and the world.

A successful negotiation requires that all those involved benefit from the outcome. It means all sides must give as well as get. Economic, military and diplomatic pressure helped bring the North Koreans to the table, but reaching a successful agreement will require carrots as well as sticks. The United States has announced that it will insist that nuclear disarmament precede economic sanctions. North Korea will likely demand substantial economic incentives in return for its well-

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# Reducing Reliance on Nuclear Weapons



The risk of nuclear use today is higher than at any time since the Cuban Missile Crisis. While fears of large-scale, world-ending nuclear war have declined, regional tensions and instability in Europe and Asia, the erosion of trust between Russia and the West, a nuclear-armed North Korea, emerging cyber threats, and the persistent risk of nuclear proliferation to states and terrorist organizations increases the possibility that a nuclear weapon will be used by accident, miscalculation, or deliberately. At the same time, the Nuclear Non-Proliferation Treaty regime—the foundation for global efforts to curb the spread of nuclear weapons and materials—is under stress, and the international community is increasingly divided over how to address nuclear dangers.

Against this backdrop, NTI worked actively in 2018 to foster the adoption of policies to reduce reliance on nuclear weapons, identify shared goals, and urge governments to take concrete steps to protect and strengthen nonproliferation measures and reduce nuclear threats.

# The Boston Globe

“A nuclear-armed Iran would be a threat to the region and the world and must never be allowed to happen.”

—Ernest Moniz, NTI Co-Chairman & CEO

## Building a Credible Nuclear Posture

In January, in anticipation of the Trump Administration’s forthcoming Nuclear Posture Review, Ernie Moniz outlined a vision for a safer future in a major speech at the Center for Strategic and International Studies. “The United States should continue its historic support for practical, concrete steps that meet the test of increasing stability, reducing nuclear dangers, and sustaining progress toward a world ultimately free of nuclear weapons,” Moniz said. His speech launched a year of intensive work by NTI to leverage our influence and expertise on this front.

In a *Roadmap for America’s Nuclear Policy and Posture* and an op-ed in *Bloomberg View*, NTI leadership recommended specific steps to reduce nuclear risks and a template for Congress and the American people to evaluate the Trump Administration’s Nuclear Posture Review, which expanded the role of nuclear weapons in U.S. national security policy. The NTI roadmap called for reduced reliance on nuclear weapons, increasing warning-and-decision time for leaders, mitigating cyber threats to nuclear command-and-control systems, preserving important arms control treaties, and resuming channels of communication with Russia on crisis management and strategic stability.

At the 2018 annual Munich Security Conference, NTI released a separate report on *Building a Safe, Secure, and Credible NATO Nuclear Posture* examining the risks, credibility, and cost of basing U.S. non-strategic nuclear weapons in Europe.







## On North Korea and Iran, Experience as a Guide

Under the leadership of Moniz, who as Energy Secretary served as the final lead negotiator of the Iran deal nuclear provisions, NTI joined U.S. allies, Iran agreement signatories, and the world's leading nuclear experts in encouraging the Trump administration to continue complying with the hard-fought 2015 agreement. NTI also produced an interactive website and infographic to help educate Congress, the news media, and other interested parties about the terms and provisions of the deal, the most comprehensive and restrictive nuclear agreement in history.

The ultimate decision to withdraw was a major strategic mistake. However, NTI identified opportunities to develop key lessons from the Iran experience that could be applied to negotiations with North Korea on denuclearization. Moniz argued for a robust verification regime in North Korea, akin to the stringent measures in the Iran deal, in an op-ed for *The Boston Globe* entitled "On Iran and North Korea: Don't Trust, and Verify, Verify, Verify." Sam Nunn and NTI Board Member and former Senator Richard G. Lugar followed up with a *Washington Post* op-ed encouraging leaders to use the Nunn-Lugar Soviet Nuclear Threat Reduction Act of 1991, also known as the Cooperative Threat Reduction Program, as a model that could guide implementation of an agreement with North Korea. In advance of the Trump-Kim Summit in Singapore, Nunn and Lugar shared their ideas directly with President Donald Trump and Vice President Mike Pence at the White House.

*Sam Nunn and Board Member Richard Lugar, along with NTI's Lynn Rusten at Lugar's right, met with U.S. Vice President Mike Pence and his staff to discuss options for North Korea, June 2018.*

(Photo: Office of the Vice President)



Moniz also shared strategies on global security, with a particular emphasis on North Korea, with a range of high-level government officials, experts, and academics during a trip to Asia, which included a widely covered speech on global threats, hosted by the East Asia Foundation in Seoul.

*Ernie Moniz met with with Kim Sung-Hwan, South Korea's former Minister of Foreign Affairs & Trade (at Moniz's left), and members of the Asia-Pacific Leadership Network, Seoul, October 2018.*

## **Global Enterprise to Strengthen Nonproliferation and Disarmament**

In 2018, NTI launched a new forum for integrated and creative dialogue among government officials to help catalyze government actions in support of the Nuclear Nonproliferation Treaty (NPT) and the 2020 NPT Review Conference. Meetings of the Global Enterprise in 2018 included more than 25 senior officials representing 23 different countries. Participants—including those from all P5 countries—are exploring options for cooperative engagement to advance shared interests in successful pursuit of the NPT's goals—preventing proliferation, fostering the peaceful uses of nuclear energy, and nuclear disarmament.



## ***Madam Secretary* Tackles Nuclear Threats**

Communicating the profound and often complex dangers posed by nuclear weapons is always a challenge—but with NTI’s help, the hit CBS show *Madam Secretary* did just that, in an edge-of-your-seat season four finale that ended not with a nuclear detonation but rather a mutual commitment to negotiate a new nuclear treaty. The episode had top U.S. political and military officials grappling with whether to retaliate after they were alerted to what appeared to be a massive incoming nuclear attack from Russia. With an assist from Moniz, who connected with the show’s writers through The Norman Lear Center at the University of Southern California’s Annenberg School for Communication, the chilling scenario was realistic and entirely plausible. NTI helped lead a social media campaign raising awareness of the episode and highlighting real-life parallels on Twitter. Following the finale, Moniz and Executive Producer David Grae held an online Q&A forum on the popular social news and discussion site, Reddit.



*Sir Adam Thomson, director of the European Leadership Network, spoke at NTI's 2018 Munich Security Conference luncheon.*

*(Photo: Munich Security Conference)*





# Encouraging U.S.-Russian Collaboration

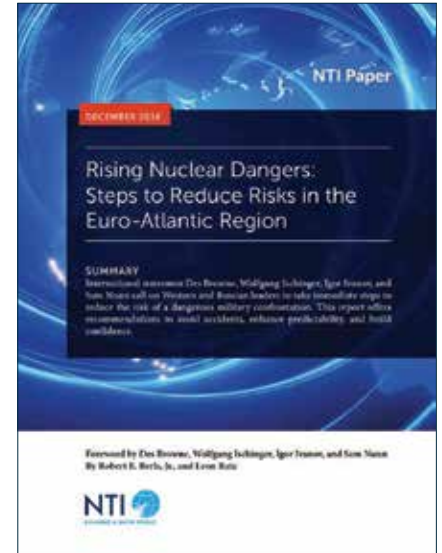


“When it comes to reducing nuclear risks, Russia and the United States are essential players and necessary partners. Washington and Moscow understood this truth for decades, working together to prevent the spread and use of nuclear weapons, maintaining scientist-to-scientist, military-to-military, and leader-to-leader dialogue to prevent accidents or miscalculation. Today that collaboration is held hostage by oscillations and severe strains in U.S.-Russian political relations. This is a dangerous and unprecedented development.” Ernie Moniz highlighted these concerns about the U.S.-Russia relationship in an op-ed published in the Russian newspaper *Kommersant* before travelling to Moscow in spring 2018.

Throughout 2018, NTI used our voice, our influence, and our expertise to encourage and facilitate the dialogue and engagement between the United States and Russia necessary to reduce catastrophic risks.

## Rising Nuclear Dangers: Diverging Views of Strategic Stability

In the aftermath of the July Summit in Helsinki between Presidents Trump and Putin, NTI released the results of a survey of U.S., Russian, and European experts confirming a divergence in views on strategic stability—a term generally understood to refer to a state of relations between nuclear powers that minimizes incentives for one side to initiate nuclear use, reduces incentives for competition in developing and deploying nuclear forces, and offers predictability and transparency in periods of heightened tensions. The survey, released as the third in NTI’s Rising Nuclear Dangers series, found that “failure to come to a common understanding of strategic stability and to resolve uncertainties about nuclear policies and conflict escalation leaves Russia and the West dangerously at risk of miscalculation with potentially devastating consequences.”



## Using Our Voice: On Helsinki and the INF and New START Treaties

In the lead-up to the Trump-Putin summit in Helsinki and in response to plans announced by the Trump administration to withdraw from an arms control treaty negotiated by President Ronald Reagan and former Soviet leader Mikhail Gorbachev, Moniz and Nunn warned against steps that would drive a more significant wedge between the United States and Russia at a time of increasing nuclear dangers. Writing in *The Hill*, Moniz and Nunn called on Trump and Putin to “approach the summit with a clear-eyed understanding of our differences” but accept the imperatives to cooperate on reducing nuclear dangers. In a statement on U.S. plans to withdraw from the INF Treaty, they said Russia’s violations of the agreement are serious and require a response but warned of a cascade of negative consequences, including acceleration of a new and dangerous arms race. They also called on the United States and Russia to agree to extend the duration of the New START Treaty, since both sides benefit from the limits it sets, the verification it requires, and the predictability it provides.

“I’m involved in the Younger Generation Leaders Network because I believe that our generation should have a say on challenges and problems that our world faces today. Through the YGLN, it is possible to share visions with people from around the globe who are united by the idea of a safer, more peaceful and more predictable international environment.”

—**Pavel Kanevskiy**, *associate professor of political science and vice dean at the Lomonosov Moscow State University and expert at the Russian International Affairs Council*



## Euro-Atlantic Security Leadership Group

NTI and partners in Europe and Russia publicly announced that an informal, independent Euro-Atlantic Leadership Security Group (EASLG) comprising former and current government officials and experts from across the region had been formed to test ideas and develop proposals for improving security in areas of common existential interest. At the 2018 Munich Security Conference, the group's leaders—Des Browne, Wolfgang Ischinger, Igor S. Ivanov, and Sam Nunn—issued statements calling for new dialogue among governments to reduce nuclear risks and to address cyber threats to nuclear facilities and to strategic warning and command-and-control systems. These proposals were shared with President Trump, President Vladimir Putin, Prime Minister Theresa May, and Chancellor Angela Merkel. The EASLG leaders also published op-eds on preventing nuclear conflict in *Project Syndicate* and *The Independent*.

*Retired Russian Major General Vladimir Dvorkin provided commentary at NTI's 2018 Munich Security Conference luncheon.*

*(Photo: Munich Security Conference)*



*Participants contribute to a dinner discussion at the Younger Generation Leadership Network meeting, Berlin, April 2018.*

## **Younger Generation Leaders Network (YGLN)**

Young professionals in their 20s and 30s from more than two dozen countries across the Euro-Atlantic region gathered in Berlin for three days of discussion on topics that included nuclear risks and the future of arms control; West-Russia relations; cybersecurity and information warfare; Ukraine; and populism, nationalism, and democratic erosion in the Euro-Atlantic region. Young leaders also heard from high-level experts, including Chairman of the Munich Security Conference Ambassador Wolfgang Ischinger at what was their eighth YGLN meeting. The YGLN is a robust next-generation capacity-building initiative launched by NTI and partners in 2014 to build trust and foster dialogue among emerging leaders from the United States, Russia, Ukraine and Europe.

The YGLN is among a group of leadership networks, which includes the European Leadership Network and the Asia-Pacific Leadership Network, co-founded and sponsored by NTI.





## Nuclear Bunkers on Minecraft, Tours of Nuclear Test Sites, and More on NTI.org

Explore the North Korean nuclear test site, Punggye-ri at Mantap Mountain, in virtual reality. Visit Minecraft, the popular immersive gaming platform, and wind through the lavish bunkers where the presidents of the United States and Russia would be protected as they wage a nuclear war. Take an interactive tour of Novaya Zemlya, the archipelago in the Arctic Ocean that serves as a Russian nuclear testing site. Or wander through a 3D “museum” filled with North Korean missiles. Understanding that interactive engagement deepens learning, NTI worked closely with long-time partner, the James Martin Center for Nonproliferation Studies, to expand these features on our website and engage new audiences.

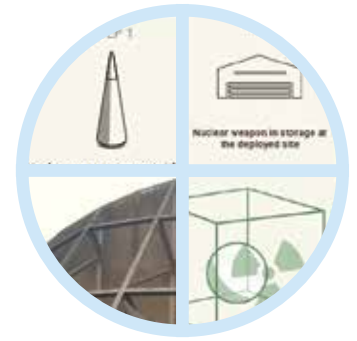
NTI Vice President Corey Hinderstein met with IPNDV partners to generate progress on verification of nuclear disarmament.



## How to Dismantle a Nuclear Weapon Verifiably?

If a government that has agreed to dismantle its weapons won't allow inspectors to see those weapons or their components for legitimate national security reasons, how can a verification process work? Good question. The IPNDV has answers, and NTI explained the 14-step process in a detailed interactive that provides the most comprehensive explanation of arms-control verification procedures ever developed.

# Advancing Verification



Nuclear-weapons stockpiles have decreased dramatically since the end of the Cold War, progress made possible by the ability of countries—primarily the United States and Russia—to monitor and verify each other’s compliance on implementing arms-reduction treaties. Today, the toolkit that inspectors use to verify compliance with a range of bilateral and multilateral agreements needs updating to address tomorrow’s challenges; new technologies and broader verification capacity will be crucial going forward.

## Technical Collaboration to Advance Disarmament Verification

NTI, the U.S. Department of State, and more than 25 countries are engaged in an innovative public-private partnership to build global verification expertise and capacity. The International Partnership for Nuclear Disarmament Verification (IPNDV) is working to identify the challenges associated with nuclear disarmament verification and to develop procedures and identify new technologies to address them.

Launched in 2014, the IPNDV completed the first phase of its work in 2017. In 2018, IPNDV experts launched Phase II and began the process of taking their work from “paper to practice,” planning hands-on activities, such as exercises and technology demonstrations. The IPNDV’s cutting-edge work was featured during the 2018 Nuclear Non-Proliferation Treaty (NPT) Preparatory Committee Meeting (PrepCom) in Geneva and was recognized more than 30 times by partners and non-partner countries during statements and in reports submitted to the PrepCom.



*Members of the IPNDV visited the Royal Air Force Honington, UK, December 2018.*



*NTI Vice President Laura S.H. Holgate spoke at the IAEA's International Conference on the Security of Radioactive Material, December 2018.*





# Preventing Dirty Bombs



A radiological “dirty bomb” detonated in the heart of a major city would cause widespread panic, leave serious damage to nearby surroundings, and cost billions of dollars in cleanup and rehabilitation. The critical ingredient for a dirty bomb is radioactive material, such as cesium-137 and cobalt-60. These materials are used in thousands of commercial, industrial, medical, and research sites in more than 100 countries. Many medical, commercial, and industrial groups that handle these materials are ill-equipped to secure them, and a lack of regulatory controls in many countries has led to thousands of missing or stolen radiological sources.

NTI works to reduce radiological risks by working globally with governments and industry on strategies to better secure and eliminate dangerous radiological materials that could be stolen by terrorists and used to build dirty bombs.

## Replacing Cesium-137 Irradiators with Alternative Technologies

NTI's partnerships with New York City, Atlanta, and throughout California to remove and replace blood irradiators that contain potentially dangerous radioactive cesium-137 sources have eliminated threats and helped pave the way for hospital systems and universities around the country interested in adopting safer, equally effective technologies that do not pose security or liability risks. To date, 70 percent of cesium-137 users have agreed to replace their devices in New York City; 90 percent within the University of California system; and 100 percent at Emory University in Atlanta.

To get there, NTI and our partners organized workshops with the broad range of stakeholders—from health providers to chief financial officers to law enforcement officials—to share information about removing the dangers and liabilities posed by radiological sources. In January, NTI, the University of California System, and the National Nuclear Security Administration (NNSA) held two workshops for researchers and hospital staff; in February, NTI and Emory University hosted a workshop for various institutions in Atlanta, attended by representatives from the federal Centers for Disease Control and Prevention, the NNSA, the Federal Bureau of Investigation, and other major city hospitals.

## Sustainable Security of Radioactive Sources in Central Asia

In partnership with the Moscow-based Center for Energy and Security Studies, NTI concluded a two-year joint effort to improve regional coordination on the security of radiological sources with the release in December of *Sustainable Security of Radioactive Sources in Central Asia*, a set of recommendations developed during two major radiological security workshops in Central Asia. The report, released at the International Atomic Energy Agency's (IAEA) International Conference on the Security of Radioactive Material, followed a workshop in June 2018 in Bishkek, Kyrgyzstan, which brought together expert representatives from all five Central Asian Republics, the United States, Canada, Russia, and the IAEA to bolster efforts to secure radioactive sources in the region and prevent illicit trafficking.



*Michael Zwick and Patty Olinger of Emory University with Sam Nunn at a radiological workshop in Atlanta, hosted by NTI and Emory, February 2018.*

(Photo: Jack Kearsé)

## NTI at the IAEA Radiological Security Conference

NTI played a central role in the IAEA International Conference on the Security of Radioactive Material and was the only non-governmental organization to participate in the planning of the December conference, which drew more than 600 people from more than 80 countries. NTI Vice President for Materials Risk Management Laura S.H. Holgate delivered plenary remarks on opening day, and NTI hosted a side event highlighting the Central Asia radiological security workshops. NTI also hosted a reception to recognize leaders in radiological security, including the New York City Department of Health, the French government, the China Center of Excellence, and key leaders from Central Asia.



*At the IAEA conference, Laura Holgate recognized leaders in radiological security at an NTI reception, December 2018.*

## Global Incidents and Trafficking Database Identifies 170+ Incidents

The annual Global Incidents and Trafficking Database, produced for NTI by the Center for Nonproliferation Studies and released in July, identified more than 170 incidents of nuclear and other radioactive materials being lost, stolen, or out of regulatory control across 14 countries in 2017. These incidents primarily involved radiological sources. The database is the only comprehensive, public dataset available and underscores the vulnerability of some nuclear materials.

The interactive database provides the locations where the incidents took place and indicates their severity. Two example cases in 2017 involved the loss of 1.4 grams of highly enriched uranium at a university in the United States, and the theft and attempted illicit sale of unspecified quantities of plutonium-239, plutonium-241, and americium-241 in Kazakhstan. The report offers detailed recommendations to improve physical security measures, international transparency, and reporting standards.





*NTI Vice President Elizabeth Cameron organized NTI's Global Biosecurity Dialogue, London, June 2018.*



# Enhancing Global Biosecurity



Biological threats have the potential to kill millions of people, cost billions in economic losses, and exacerbate political and economic instability. The risk of a catastrophic biological event is magnified by our interconnected world, terrorist interest in weapons of mass destruction, and rapid advances in technology.

NTI's new, expanded program—which we refer to as NTI | bio—works to raise visibility and identify solutions to make biosecurity a global priority on the world stage.

## **NTI | bio Advisory Group**

In June, NTI launched a new high-level Bio Advisory Group. The group—chaired by former commissioner of the Food and Drug Administration Margaret A. Hamburg, MD, an NTI board member who now serves as foreign secretary of the National Academy of Medicine—will provide strategic guidance on the program's effort to reduce global biological risks. See the full list on page 40.

## **Biosecurity Innovation and Risk Reduction**

Advances in biotechnology offer enormous benefits but also come with inherent risks related to accidental or deliberate misuse. To reduce those risks, NTI | bio partnered with technical leaders, research funders, and scientific publishers from around the world to launch the NTI Biosecurity Innovation and Risk Reduction Initiative. This multiyear project seeks to identify, develop,

publicize, and promote actions to reduce global catastrophic biological risks associated with advances in technology. This initiative already has catalyzed a new partnership between NTI and the World Economic Forum to develop approaches to prevent illicit gene synthesis, as well as a novel collaboration to develop a seal of approval for institutions seeking to reduce biological risks associated with advances in technology.

## Global Biosecurity Dialogue

As biological risks become more complex and global, it's more important than ever that countries and international institutions make biosecurity a policy and financial priority and that they track commitments and account for actions—but doing so has lagged behind increasingly complex and global risks. Within months of its 2018 launch, NTI's new Global Biosecurity Dialogue, which brings together senior government officials to identify ways to prioritize addressing biological risks, has already spurred new actions from governments and regional organizations and sparked the formation of regional biosecurity workshops in partnership with the Africa Centres for Disease Control and Prevention.

## Deterring Catastrophic Biological Risks, Enhancing Detection of Emerging Threats

As technology advances, future opportunities for powerful actors to misuse biotechnology may increase. Deterring misuse and advancing real-time disease detection are vital to preventing pandemics. In 2018 NTI co-convoked an international workshop to consider the potential for high-impact biological threats to cause global catastrophic, population-wide consequences and discuss urgent actions to mitigate the consequences posed by them. NTI also brought together experts to support the development of a rapid disease-detection framework, including methods for real-time identification of emerging infectious diseases, high-consequence pathogens of unknown origin, and potentially engineered agents.

## 2018 Next Generation for Biosecurity Competition

Seeking to engage a new generation of health security professionals to address biological risks, NTI and the Next Generation Global Health Security Network launched an annual competition in 2017 to generate cross-regional partnerships and proposals to improve biosecurity globally.

In 2018, the winners were announced: Peter Babigumira Ahabwe, a pharmacist in Uganda; Dr. Frances Butcher, a public health specialist in England; and Javier Rodriguez, a radiological security expert in Argentina. The trio proposed an online platform for students and entry-level professionals to engage in peer-to-peer discussions, eLearning scenarios, and more.



*Participants at a meeting on biosecurity innovation and risk reduction hosted by NTI, Wellcome Trust, and World Economic Forum, London, June 2018.*



*Winners of NTI's Next Generation for Biosecurity competition attended the Global Health Security Agenda Ministerial in Bali, November 2018.*



## Global Health Security Index

In 2018, NTI began developing a Global Health Security (GHS) Index in partnership with The Economist Intelligence Unit and the Center for Health Security at the Johns Hopkins Bloomberg School of Public Health. The GHS Index will draw on publicly available information to assess country preparedness for pandemic threats using a framework that is informed by a global panel of experts. The GHS Index will serve as a tool for country governments, development banks, and donors to better address vital gaps in country capability to prevent, detect, and respond to biological events—before they can spread or lead to cascading and further destabilizing effects.



*NTI Executive Vice President Deborah Rosenblum speaks at the Biosecurity Innovative Risk Reduction Initiative at MIT, Cambridge, MA, October 2018.*

“The Next Generation for Biosecurity Competition is an exemplary enterprise that forged international dialogues and helped materialize good ideas to actual, concrete project proposals.”

—**Dr. Mark van Passel**, *Project Coordinator, National Institute for Public Health and the Environment, Netherlands*

## New Tools Illustrate Need to Prevent, Detect, Respond to Biological Threats

Bringing biosecurity messages to non-expert audiences, NTI | bio released a video and an interactive microsite that ended with a call for U.S. leadership in global health security. These tools illustrate the risk factors and vulnerabilities in countries around the world that could lead to a biological event with staggering consequences. George Mason University’s biodefense blog, *Pandora Report*, raved: “NTI has released an extremely informative and helpful page with details regarding the cost of biothreats, quotes from reports, consequences of such events, etc. The best though, is a navigation tool that explores how every and any country is vulnerable.”

Visit [TimelsNow.nti.org](https://www.timelsnow.nti.org) to see the site.



*Siegfried S. Hecker, NTI advisor and co-director of the Stanford University Center for International Security and Cooperation, launched the NTI Seminar series.*



# NTI Seminars



Responding to the need for creative thinking and robust dialogue on global security challenges related to weapons of mass destruction and disruption, NTI launched an on-the-record seminar series in 2018. The popular series, hosted by Ernie Moniz and held in NTI's new conference space, features leading global security experts, authors, and industry professionals sharing their perspectives and expertise.

In 2018, the series attracted hundreds of policymakers and practitioners—from government and the private sector, students and academics, experts and embassy personnel, journalists, and other interested parties—to hear from a range of experts on a range of topics:

- Siegfried S. Hecker and Robert L. Carlin of Stanford University offered "A Comprehensive History of North Korea's Nuclear Program and Lessons Learned"
- Richard Nephew addressed "Sanctions Policy Implications of the U.S. JCPOA Withdrawal"
- Reshma Shetty discussed "Biosecurity by Design: Getting Ahead of Risk in the World of Designer Organisms"
- *New York Times* journalist and author David Sanger focused on his new book, "The Perfect Weapon," and related cyber issues
- Michael C. Horowitz of the University of Pennsylvania described his research in a talk titled, "A Stable Nuclear Future? Autonomous Systems, Artificial Intelligence, and Strategic Stability"
- Moran Cerf, professor of neuroscience and business at Northwestern University, described "Your Brain on Catastrophic Risk."





## Jill Hruby: The First Sam Nunn Distinguished Fellow

In November 2018 NTI named Jill Hruby, former director of Sandia National Laboratories, as the first Sam Nunn Distinguished Fellow, a new NTI position designed to seed innovation in threat reduction. Her work focuses on the intersection of technology and security.

“To identify our first Sam Nunn Distinguished Fellow, we looked for someone with the talents Sam embodies: An ability to identify new threats on the horizon, an interest in practical solutions, and a spirit of collaboration. We found them all in Jill,” said Moniz, when her position was announced.

While at NTI, Jill reviewed a number of technologies that could impact nuclear weapons arms control treaties or agreements and is focusing most of her efforts on hypersonic technologies and artificial intelligence. In 2019, NTI will publish a report on the technical and military characteristics of Russia’s new nuclear-capable military systems. An artificial intelligence study will help address how this fast-growing field could positively or negatively affect nuclear threats. Jill also has been presenting work on the annual assessment process at the national laboratories for safe and reliable nuclear weapons and on the 2018 Nuclear Posture Review to a variety of audiences. She is helping establish strategic relationships with Stanford and Georgia Tech.

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*The Sam Nunn Distinguished Fellow program is made possible through generous donations from Charles B. Curtis, Edlow International, the Hess Foundation, the Michael A. Peterson Foundation, and Major General Arnold and Jan Punaro.*



# Visiting Hiroshima

Ernie Moniz and Joan Rohlfing visited Hiroshima, Japan, this year, separately and each for the first time, to meet with Hiroshima Prefecture Governor Hidehiko Yuzaki and tour the city's Peace Memorial Park and Museum. Joan also participated in a discussion with global experts, brought together by Yuzaki, to explore ideas for reducing the nuclear threat in North Korea and for moving countries with nuclear weapons away from the practice of relying on nuclear weapons for their security. The group addressed questions such as: How can it be consistent with international laws of armed conflict to use a weapon that does not discriminate between civilians and combatants? Is it moral to threaten the use of such a weapon to prevent its ultimate use? Is it realistic to expect these weapons will never be used, on purpose or by accident, if we keep them indefinitely deployed and ready for use? "Our proximity to the consequences of nuclear use in Hiroshima sharpened our focus on these fundamental questions," Joan wrote in a moving piece on her visit for NTI's *Atomic Pulse* blog.

*NTI President Joan Rohlfing introduces a panel at the NTI Board meeting dinner.*





# 2018 Financials



## Where the Funds Came From

- 47% Individuals and Corporations
- 49% Foundations
- 1% Governments
- 3% Investment Income
- <1% In-Kind Gifts and Other Income

## Where the Funds Were Spent

### 2018 EXPENDITURES

■ 17%	Communications and Public Education	\$ 3,272,944
■ 17%	Global Nuclear Policy Program	\$ 3,230,065
■ 15%	Global Biological Policy and Programs	\$ 2,942,833
■ 11%	International Fuel Cycle Strategies	\$ 2,035,138
■ 10%	Scientific and Technical Affairs	\$ 1,879,460
■ 9%	Materials Security and Minimization	\$ 1,704,077
■ 4%	Other Program Services	\$ 690,965
■ 12%	Management and General	\$ 2,315,018
■ 6%	Fundraising	\$ 1,192,557
<b>TOTAL EXPENDITURES</b>		<b>\$ 19,263,057</b>



*NTI Board member Margaret A. Hamburg at an NTI reception.*



# With Thanks to Our Supporters

NTI's critical work is possible only through the generous support of individuals, private foundations, corporations, and international donors. As an accredited 501(c)(3) nonpartisan public charity, we rely on our community of engaged donors to help us build a safer world.

## Give a Gift with Global Impact

We invite you to join NTI to combat the most urgent security threats of the 21st century by supporting our work. Your tax-deductible gift helps safeguard lives, livelihoods, and the environment, now and for future generations.

NTI donors can take part in stimulating NTI-hosted dialogues with leading experts on the nuclear, biological, cyber, and radiological threats facing our world. For more information or to make a tax-deductible contribution, please contact:

Peggy Knudson, Chief Development Officer  
202-417-4884 or [knudson@anti.org](mailto:knudson@anti.org) • [www.nti.org/donate](http://www.nti.org/donate)

## Thank You!

We gratefully acknowledge all of our 2018 funders, including the following generous institutions and individuals who gave \$500 or more. Your gift to NTI makes the world safer. Thank you for your trust and for supporting this critical mission.

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*We would like to thank former staff who contributed to our work in 2018:* Diane G. Hauslein, Beenish Pervaiz, Brian Rose, Meaghan Webster.

*As of December 31, 2018*



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My colleagues at the Nuclear Threat Initiative and I stand in solidarity with our Japanese brothers and sisters — no more Hiroshimas. We will dedicate ourselves to this task even more after this moving visit to the Hiroshima Peace Memorial.

Ernest J. Moniz  
13th U.S. Secretary of Energy