

PROJECT ON MANAGING THE ATOM

PREVENTING NUCLEAR TERRORISM

CONTINUOUS IMPROVEMENT
OR DANGEROUS DECLINE?

MATTHEW BUNN

MARTIN B. MALIN

NICKOLAS ROTH

WILLIAM H. TOBEY



HARVARD Kennedy School

BELFER CENTER for Science and International Affairs

MARCH 2016

Project on Managing the Atom
Report

Belfer Center for Science and International Affairs
Harvard Kennedy School

79 JFK Street
Cambridge, MA 02138
617-495-4219
atom@hks.harvard.edu
<http://www.belfercenter.org/mta>

The authors of this report invite liberal use of the information provided in it for educational purposes, requiring only that the reproduced material clearly cite the source, using:

Matthew Bunn, Martin B. Malin, Nickolas Roth, and William H. Tobey, *Preventing Nuclear Terrorism: Continuous Improvement or Dangerous Decline?* (Cambridge, MA: Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, March 2016).

Design & Layout by Andrew Facini

Cover photo:

The "Tunnel Vault" nuclear materials storage facility at Technical Area 41, Los Alamos National Laboratory, as seen in October, 1964. (Los Alamos Archive).

Copyright 2016, President and Fellows of Harvard College
Printed in the United States of America

ACKNOWLEDGMENTS

The authors would like to thank Tom Bielefeld and Rolf Mowatt-Larssen, as well as a number of U.S. government and IAEA officials who provided helpful comments on this paper. The authors are grateful to Josh Anderson, Brett Cox, Andrew Facini, Bobby Kim, and Kate Miller, for their help with the editing and preparation of the report. Research for this paper was supported by grants from the Carnegie Corporation of New York and the John D. and Catherine T. MacArthur Foundation.

ABOUT THE AUTHORS

Matthew Bunn is a Professor of Practice at Harvard University's John F. Kennedy School of Government. Before joining the Kennedy School, he served for three years as an adviser to the Office of Science and Technology Policy, where he played a major role in U.S. policies related to the control and disposition of weapons-usable nuclear materials in the United States and the former Soviet Union. He is the winner of the American Physical Society's Joseph A. Burton Forum Award for "outstanding contributions in helping to formulate policies to decrease the risks of theft of nuclear weapons and nuclear materials" and the Federation of American Scientists' Hans Bethe Award for "science in service to a more secure world," and is an elected Fellow of the American Association for the Advancement of Science. He is the author or co-author of over 20 books or major technical reports, and over a hundred articles in publications ranging from *Science* to *The Washington Post*.

Martin B. Malin is the Executive Director of the Project on Managing the Atom at Harvard's Belfer Center for Science and International Affairs. His research focuses on arms control and nonproliferation in the Middle East, U.S. nonproliferation and counter-proliferation strategies, and the security consequences of the growth and spread of nuclear energy. Prior to coming to the Kennedy School, Malin taught courses on international relations, American foreign policy, and Middle East politics at Columbia University and Rutgers University. He also served as Director of the Program on Science and Global Security at the American Academy of Arts and Sciences.

Nickolas Roth is a Research Associate at the Belfer Center's Project on Managing the Atom. Before coming to Harvard, he spent a decade working in Washington, D.C., where his work focused on improving government accountability and project management, arms control, and nonproliferation. Mr. Roth has written dozens of articles on nuclear security, nonproliferation, and arms control. His work has appeared in newspapers around the world. Roth is also a Research Fellow at the Center for International and Security Studies at the University of Maryland.

William H. Tobey is a Senior Fellow at the Belfer Center for Science and International Affairs at Harvard Kennedy School. He was most recently deputy administrator for Defense Nuclear Nonproliferation at the National Nuclear Security Administration. Mr. Tobey served on the National Security Council (NSC) staff in three administrations—Reagan, George H. W. Bush, and George W. Bush—working in defense policy, arms control, and counterproliferation positions. As director of counterproliferation strategy at the NSC, he oversaw development and implementation of U.S. policy on nuclear programs in Iran and North Korea, was a delegate to the Six Party Talks with North Korea, managed U.S. efforts to dismantle Libya's weapons of mass destruction programs, and authored the first draft of United Nations Security Council Resolution 1540. He has also served on the National Academies of Sciences, Engineering, and Medicine Committee on Improving the Assessment of Proliferation Risk of Nuclear Fuel Cycles.

Risk Summary and Trend: Overall, the risks of nuclear theft in Russia appear to be moderate. Nuclear security measures are drastically improved, but still have some weaknesses, and the threats these security systems must counter are substantial. While Russia continues to make some nuclear security improvements, the overall risk trend appears to be toward increasing risk, with the end of all but a modest portion of U.S.-Russian nuclear security cooperation, an increase in the threat of Islamic terrorism, and increasing economic uncertainty that could make it difficult for facilities to allocate resources for nuclear security.

Pakistan

In Pakistan, a modest but rapidly growing nuclear stockpile, with substantial security measures, must protect against some of the world's most capable terrorist groups, in an environment of widespread corruption and extremist sympathies.⁸⁰

Pakistan has substantially strengthened its nuclear security in the past two decades. In a recent survey of nuclear security experts, the Pakistani participant reported dramatic recent changes in the organizations governing nuclear security; in the numbers, training, and equipment of guard forces; in approaches to screening personnel; in requirements for nuclear material accounting and control; and in approaches to strengthening security culture, along with substantial changes in every other aspect of nuclear security covered in the survey.⁸¹ By some estimates, the Strategic Plans Division, which manages Pakistan's nuclear weapons, has 25,000 troops available to guard Pakistani nuclear stocks and facilities.⁸² Pakistani officials report that sites are equipped with extensive barriers and detection systems, that the components of nuclear weapons are stored separately (though that may be changing as Pakistan moves toward tactical nuclear weapons intended to

80 For a previous assessment, see Bunn *et al.*, *Advancing Nuclear Security*, pp. 17–20.

81 Bunn and Harrell, *Threat Perceptions and Drivers of Change*, p. 9.

82 Finance Minister Ishaq Dar asserted that a “special security force of 25,000 personnel, who have been specially trained and provided sophisticated weapons, has been deployed to protect (the nuclear assets).” See “Pakistan Says ‘25,000 Guards Watching Nukes,’” *Global Security Newswire*, June 25, 2013, <http://www.nti.org/gsn/article/pakistan-says-25000-nuke-oversight-duty/> (accessed June 5, 2015). By another account, the total strength of the “security division” of the National Command Authority was 20,000 in 2013, but headed upward to 28,000. Not all of these personnel may be assigned to guard duties at any particular time. See Naeem Salik and Kenneth N. Luongo, “Challenges for Pakistan's Nuclear Security,” *Arms Control Today*, March, 2013, https://www.armscontrol.org/act/2013_03/Challenges-for-Pakistans-Nuclear-Security (accessed February 9, 2016). Security force for nuclear sites at 20,000, heading up to 28,000. Used to be mainly retired military. Now they are being replaced by new recruits trained at the new training center, allegedly comparable to the one the U.S. has established in New Mexico. Security force capabilities tested through “field exercises and war games.” Sites have inner and outer perimeters with electronic sensors “and counterintelligence teams.” All personnel brought into “any components of the strategic program” are screened “in concert with other intelligence agencies” (presumably ISI).

be rapidly deployed to the field), and that Pakistani weapons are equipped with locks to prevent unauthorized use.⁸³ The United States has engaged in extensive cooperation with Pakistan to improve nuclear security, an effort reportedly expanded after President Obama took office.⁸⁴ Despite a variety of negative reports in the U.S. press on Pakistani nuclear security, U.S. officials from President Obama to the Chairman of the Joint Chiefs of Staff have repeatedly expressed confidence in Pakistani nuclear security arrangements. It is notable, however, that these statements of confidence have not been repeated at recent high-level U.S.-Pakistani meetings—suggesting that the United States has concerns about some elements of Pakistan’s nuclear security approach.⁸⁵ The Director of the U.S. Defense Intelligence Agency, however, testified in February 2015 that improvements were continuing.⁸⁶

There are also negative trends, which may be related to the absence of recent U.S. expressions of confidence. Pakistan has the world’s fastest-growing nuclear arsenal, and is shifting toward tactical nuclear weapons intended to be dispersed to front-line forces early in a crisis, increasing the risks of nuclear theft should such a crisis occur. This increase in numbers of weapons is probably leading to an increase in numbers of locations as well. In particular, Pakistan brought a fourth plutonium production reactor online in 2014, and in 2015 reports suggested that a new plutonium reprocessing plant for handling the spent fuel from these reactors was either operational or nearly so.⁸⁷

Pakistan’s nuclear security systems must protect against almost overwhelming adversary threats. Terrorist groups continue to demonstrate that they are willing and able to launch

83 For separate component storage, see, for example, David Albright, “Securing Pakistan’s Nuclear Infrastructure,” in Lee Feinstein, ed., *A New Equation: U.S. Policy Toward India and Pakistan After September 11* (Washington, D.C.: Carnegie Endowment for International Peace, 2002), <http://www.carnegieendowment.org/files/wp27.pdf> (accessed July 9, 2015). For weapons incorporating locks, see, for example, Hamid Mir, “Interview With Former Pakistan Atomic Energy Commission Chairman Samar Mubarakmand” (Geo-TV, March 5, 2004), <http://www.pakdef.org/forum/topic/8015-dr-samar-mubarakmands-interview-with-geo-tv/> (accessed May 27, 2015). It is not known how such locks would be incorporated in weapons that are stored in disassembled form, or how difficult the Pakistani lock designs would be to bypass.

84 For one unclassified account of this cooperation and the U.S. concerns that drove it, see David Sanger, *Confront and Conceal: Obama’s Secret Wars and Surprising Use of American Power* (New York: Crown, 2012), pp. 58–67.

85 See, for example, “U.S.-Pakistan Strategic Dialogue Joint Statement” (Washington, D.C.: U.S. Department of State, March 1, 2016), <http://www.state.gov/r/pa/prs/ps/2016/03/253857.htm> (accessed March 13, 2016). That statement only notes activities such as Pakistan hosting IAEA events and committing to ratify the amendment to the CPPNM; there is no mention of nuclear security cooperation and no expression of confidence in Pakistan’s nuclear security arrangements.

86 Quoted in Paul K. Kerr and Mary Beth Nikitin, “Pakistan’s Nuclear Weapons” (Washington, D.C.: Congressional Research Service, January 14, 2016), <https://www.fas.org/sgp/crs/nuke/RL34248.pdf> (accessed January 26, 2016), p. 19.

87 David Albright and Serena Kelleher-Vergantini, “Pakistan’s Fourth Reactor at Khushab Now Appears Operational,” *Institute for Science and International Security*, January 16, 2015, http://isis-online.org/uploads/isis-reports/documents/Khushab_January_2015_reactor_four_operational_FINAL.pdf (accessed January 16, 2016). See also, Zia Mian, “Pakistan’s Chashma reprocessing plant may be completed,” *International Panel on Fissile Materials Blog*, February 23, 2015, http://fissilematerials.org/blog/2015/02/pakistans_chashma_reproce.html (accessed February 5, 2016).

complex, well-coordinated attacks on heavily defended military targets within Pakistan. For example, In September 2014, a group of naval officers who had been recruited by al Qaeda's newly formed South Asia branch attempted to seize a Pakistani frigate, with the idea of using its anti-ship missiles to attack U.S. naval vessels, provoking an extended fire-fight.⁸⁸ The Pakistani defense minister told Parliament "without assistance from inside, these people could not have breached security."⁸⁹ Sympathy for Islamic extremist causes remains widespread in Pakistan, including in the nuclear and security establishments—some of whom have long been key sources of support for the Taliban, Lashkar e Taiba, Jaish Mohammed, and other terrorist groups. At the same time, the militants' extreme violence has undermined any support they once had and provoked significant Pakistani military action against them; if successful, these actions may reduce the risk that militants could succeed in a nuclear theft attempt. Pakistan also suffers pervasive and deeply ingrained corruption, which can create additional opportunities for insider recruitment.⁹⁰

Risk Summary and Trend: Overall, the risk of nuclear theft in Pakistan appears to be high. The trend seems to be toward increasing risk, as Pakistan's nuclear arsenal expands and shifts toward tactical nuclear weapons, while adversary capabilities remain extremely high. Over the longer term, the possibilities of state collapse or extremist takeover cannot be entirely ruled out, though the near-term probability of such events appears to be low.

88 For accounts of this incident, see, for example, Syed Shoaib Hasan, Saeed Shah, and Siobhan Gorman, "Al Qaeda Militants Tried to Seize Pakistan Navy Frigate: Al Qaeda Raid Foiled After Firefight Involving Rogue Naval Officers," *Wall Street Journal*, September 16, 2014, <http://www.wsj.com/articles/al-qaeda-militants-tried-to-seize-pakistan-navy-frigate-1410884514> (accessed June 5, 2015); Syed Raza Hassan and Katherine Houreld, "In Attack by Al Qaeda, Lines Blur Between Pakistan's Military, Militants," *Reuters*, October 1, 2014, <http://www.reuters.com/article/2014/10/01/us-pakistan-militants-attacks-insight-idUSKCN0HP2MM20141001> (accessed June 5, 2015). In addition to the four plotters killed in the attack, the Pakistani Navy reportedly arrested eight other men, including four serving on the ship.

89 Hasan, Shah, and Gorman, "Al Qaeda Militants."

90 In 2014, Transparency International ranked Pakistan 126th out of 174 countries in its Corruption Perceptions Index. See Transparency International, *Corruption Perceptions Index 2014* (Berlin: Transparency International, 2014), <http://www.transparency.org/cpi2014> (accessed February 4, 2016). For a discussion of the potential links between corruption and nuclear theft, see Matthew Bunn, "Corruption and Nuclear Proliferation," in Robert Rotberg, ed., *Corruption, Global Security, and World Order* (Washington, D.C.: Brookings, 2009).