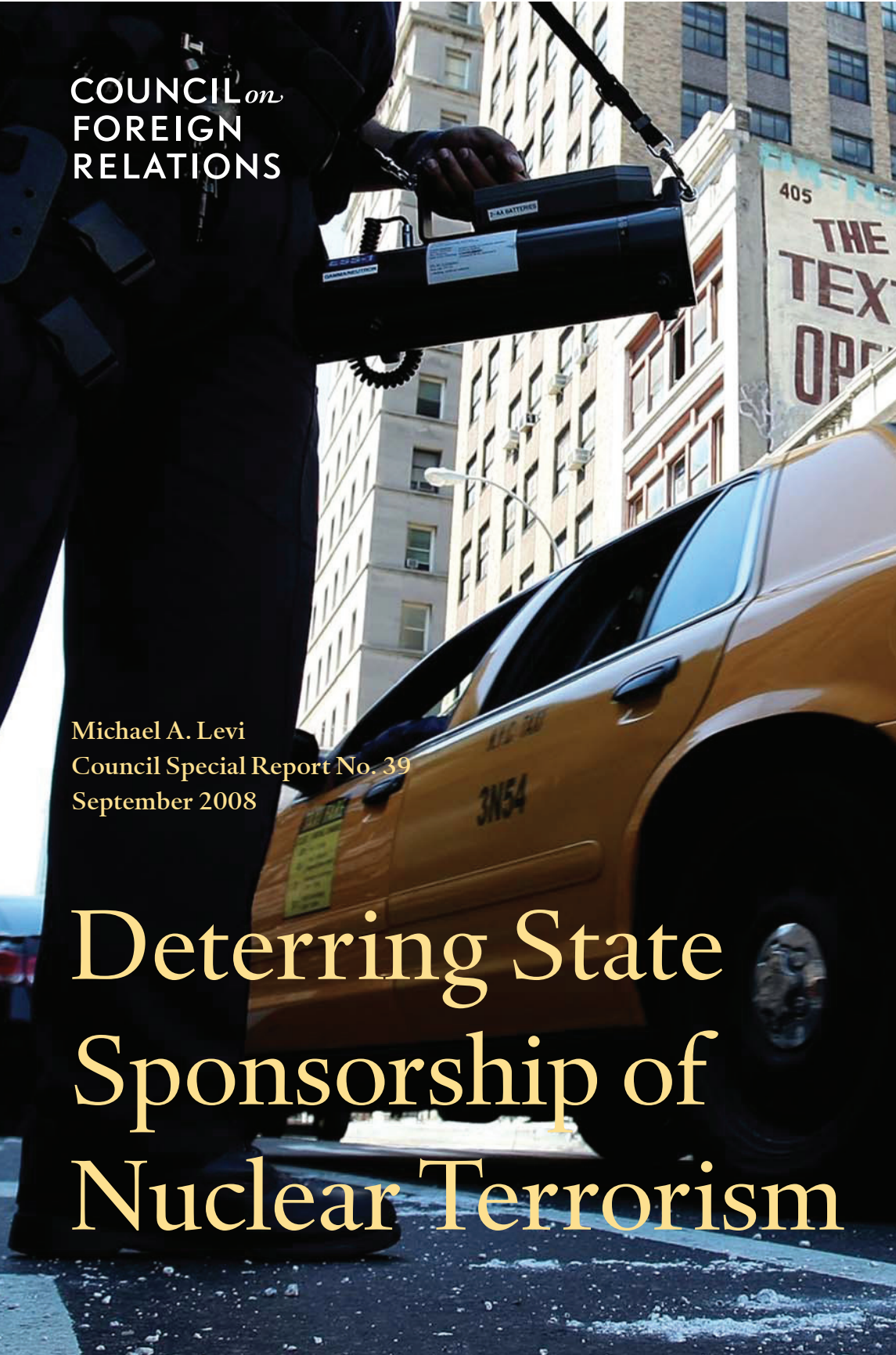

Michael A. Levi
Council Special Report No. 39
September 2008

Deterring State Sponsorship of Nuclear Terrorism

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CSR No. 39, September 2008

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Cover Photo: Mario Tama/Getty Images. A New York Police Department officer uses a radiation detection device to monitor traffic following a "dirty bomb" threat on August 11, 2007, in New York City.

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Foreword

The basis of nuclear doctrine during the Cold War was deterrence. Nuclear powers were deterred from attacking each other by the fear of retaliation. Today, much of the concern over possible nuclear attack comes in the context of rogue states and terrorism. And since only states are known to possess nuclear weapons, an important question is how to deter them from letting terrorists acquire a device, whether through an authorized transfer or a security breach.

Michael A. Levi analyzes this aspect of deterrence in the post–Cold War world, as well as what to do if deterrence breaks down. He suggests how to discourage states from giving weapons or nuclear materials to terrorists and how to encourage states to bolster security against any accidental transfer. The report also discusses the role of nuclear attribution—the science of identifying the origin of nuclear materials—in deterring transfers, an essential link in assigning responsibility to governments for transfers of nuclear materials.

Deterring State Sponsorship of Nuclear Terrorism offers thoughtful analysis and practical guidelines for U.S. policy on a complex and important question. I expect that some points will be controversial—for example, the reluctance to threaten regime change as an element of deterrence and the more general willingness to work with countries that have lost control over nuclear materials. Whatever one's views on these and other questions, the report makes an important contribution to the thinking in an underexplored but unavoidable area of the post–Cold War security debate.

Richard N. Haass
President
Council on Foreign Relations
September 2008

Acknowledgments

I am grateful to the Council on Foreign Relations (CFR) for sponsoring this report.

Many people provided valuable input and assistance as I drafted this report. I am thankful to CFR President Richard N. Haass and Director of Studies Gary Samore for providing helpful comments on drafts. Thanks also go to Patricia Dorff and Lia Norton in Publications for ably steering the report through publication and to Lisa Shields, Anya Schmemann, and Sara Weeks in Communications and Marketing for their skill in promoting and distributing the report. My gratitude also to Assistant Director of Studies Melanie Gervacio Lin for guiding the CSR through the Studies department and to Research Associates Susan Basu and Katherine Michonski for their editing and organizing efforts.

In drafting this report, I conferred with an advisory committee that met to offer valuable feedback. I would like to thank Daniel B. Poneman for his insightful comments and for skillfully chairing the group, despite his significant disagreements with some elements of the report. Thank you also to all advisory committee members for generously providing their advice and support, as well as to several others who have asked not to be named.

This publication was made possible by grants from the Carnegie Corporation of New York and the John D. and Catherine T. MacArthur Foundation. The statements made and views expressed herein are solely my own.

Michael A. Levi

Council Special Report

Introduction

Policymakers consistently identify nuclear terrorism as one of the greatest threats facing the United States and the world. Indeed, the diffusion of technology, the rise of extremist ideology, and the steady spread of nuclear materials conspire to make nuclear terrorism an increasingly worrying prospect.

Analysts have long argued that the central pillar of Cold War strategy—deterrence by threat of punishment—is largely irrelevant to this fight. The core logic of Cold War deterrence was straightforward: if one state attacked another with nuclear arms, the response would be overwhelming; that prospect would, in turn, deter any state from launching an attack in the first place. But terrorist bombs carried across borders or shipped in cargo containers lack the clear return addresses of warheads mounted on missiles, while terrorist groups, unlike states, do not present clear targets for retaliation.

Most efforts to prevent nuclear terrorism have instead aimed to eliminate the threat directly. They seek to cut it off at the source by stopping terrorists from acquiring the nuclear explosive materials—highly enriched uranium or plutonium—that are scarce but are essential components of any nuclear bomb. Doing this involves a mix of cooperation with states to secure their weapons and materials and confrontation with others to prevent them acquiring nuclear weapons or materials in the first place.

Yet traditional deterrence is enjoying a resurgence in popularity, albeit in a supporting rather than a central role.[1] North Korean acquisition of a nuclear stockpile has prompted concern that Pyongyang might transfer nuclear weapons or materials to a terrorist group; the United States has responded by implicitly threatening North Korean

leaders with retaliation should terrorists use its stockpile to mount an attack against the United States. A critical component of this has been a push to increase U.S. "attribution" capabilities—abilities to trace materials used in a terrorist attack to their source—so that leaders cannot transfer nuclear weapons or materials anonymously.

Some strategists have also pressed for a more expansive role for attribution and deterrence, arguing that all states should be held accountable—through military, economic, or political punishment—if inadequate security over their nuclear stockpiles lets terrorists acquire weapons or materials and mount a nuclear attack. The United States would threaten to retaliate against the source of materials in the aftermath of a terrorist attack, in order to prod potential sources—states such as Russia and Pakistan—to tighten control over their nuclear stockpiles now, lowering the odds of an attack in the first place.

These approaches have natural appeal given the gravity of the nuclear terrorist threat and the familiarity of Cold War deterrence. And strategists are right to assert that the world must hold states accountable for how they handle their stockpiles. But they are largely wrong to translate that into policy by using variations on Cold War deterrence.

Threatening retaliation against countries like Russia and Pakistan in response to terrorist attacks stemming from lax security practices is unwise. It undercuts efforts to work cooperatively with those states to improve their nuclear security; dissuades those states from informing others if they discover that their nuclear weapons or materials are ever stolen, thus undermining any efforts to recover them; and makes it difficult to work with those states in the aftermath of an attack to prevent further detonations. At the same time, U.S. threats are likely to do little to actually encourage many critical states to take nuclear terrorism more seriously—Russia and Pakistan, in particular, face terrorist threats of their own, and the prospect of nuclear attacks on Moscow or Islamabad by Chechen separatists or Islamist radicals is surely greater motivation for strengthened nuclear security than the possibility that, following an attack on Washington, the United States might somehow retaliate. (To the extent that retaliatory threats are military in nature, they will also often be incredible; it is implausible, for example, that the

United States would retaliate militarily against Russia. On the other hand, more plausible threats, such as economic or political ones, are far weaker.) Adapting deterrence to cases of lax security is likely to increase, rather than decrease, the nuclear terrorist threat. The United States should, in most cases, emphasize cooperation instead while explicitly ruling out retribution.

North Korea is a critical exception: it is unique among nuclear states in that there is a real prospect that, absent the possibility of retaliation, its leaders might deliberately transfer nuclear materials to a terrorist group. (Other states—including Iran as well as Pakistan under different leadership—might fit this description in the future.) Strategists are thus correct to adapt Cold War deterrence to this case. But this task is not as simple as having the ability to attribute nuclear materials to North Korea and threatening to retaliate following any attack. It requires careful thought about how to maximize the credibility of U.S. threats and about how to ensure that U.S. strategy does not dangerously and unnecessarily provoke Pyongyang.

The United States is believed to already have significant abilities to attribute nuclear attacks to North Korea. It should aim to increase its perceived ability to attribute such attacks not only by investing more in the means to trace nuclear materials, but also by publicly demonstrating those capabilities on a regular basis by consistently and vigorously investigating nuclear leaks and publicizing the results. It should also develop shared procedures and understandings with North Korea's neighbors—particularly Japan and South Korea, which are most vulnerable to North Korean counterretaliation, and hence which are most likely to press the United States for restraint in the face of an attack—for deciding whether Pyongyang is the source of nuclear materials used in any attack.

In addition, the United States must sharpen its declaratory policy by stating that the U.S. president may still decide, based on compelling but imperfect evidence, to retaliate following a nuclear terrorist attack. At the same time, if the United States does retaliate following a terrorist attack, it must be firm (almost certainly by applying substantial force against military targets), but, most likely, restrained, including by

avoiding the use of nuclear weapons and by stopping short of regime change. That would minimize the odds of provoking a North Korean counterattack while maximizing the chances that, if North Korean leaders have already transferred more materials or bombs, they will cooperate in attempting to recover them.

This report makes the case for this strategy in five sections. The first reviews U.S. policy and describes the threats that new versions of deterrence aim to address. The second provides an overview of U.S. attribution capabilities. The third explains why a doctrine of responsibility makes sense in dealing with countries like Russia and Pakistan but why variations on Cold War deterrence are the wrong way to put it into practice. The fourth examines North Korea, assessing different options for declaratory policy and recommending an appropriate approach to deterrence. The fifth proposes steps to strengthen attribution capabilities in ways that would best support effective deterrence.

Current U.S. Policy and Nuclear Threats

The September 11, 2001, al-Qaeda attacks led many to instinctively reject the potential value of deterrence in confronting terrorism. Yet even in the immediate aftermath of those attacks, policymakers were exploring opportunities to adapt the Cold War stalwart, and strategists were publishing arguments in favor of revisiting and revising deterrence.[2]

That debate took center stage in October 2006 when President George W. Bush declared that the United States would hold North Korea "accountable" if it transferred nuclear weapons or materials to terrorist groups. That was widely interpreted as a threat to retaliate against North Korea if its materials or weapons were used in a terrorist attack against the United States.[3] Since then, U.S. policy has expanded in scope. It was most recently updated by National Security Adviser Stephen J. Hadley in a February 2008 speech:

> The president has approved a new declaratory policy to help deter terrorists from using weapons of mass destruction against the United States, our friends, and allies. … The United States has made clear for many years that it reserves the right to respond with overwhelming force to the use of weapons of mass destruction. … Additionally, the United States will hold any state, terrorist group, or other non-state actor fully accountable for supporting or enabling terrorist efforts to obtain or use weapons of mass destruction …

This statement was notable for three reasons. First, President Bush referred only to North Korea, but Hadley's statement applied universally.[4] Second, Hadley's remarks appeared to open the door to retaliation in response to inadvertent loss of control over nuclear weapons or materials. Third, Hadley's statement was remarkable for juxtaposing his declaration about nuclear terrorism with a reference to "overwhelming force." By doing that, rather than by simply speaking about "accountability," he appeared to suggest that the United States might resort to a nuclear response.[5]

Variations on this approach have bipartisan support. Writing in May 2007, Senator Joseph R. Biden Jr. (D-DE) asserted:

> We must make clear in advance that we will hold accountable any country that contributes to a terrorist nuclear attack, whether by directly aiding would-be nuclear terrorists or willfully neglecting its responsibility to secure the nuclear weapons or weapons-usable nuclear material within its borders.

Barring an evolution in strategic thinking, whatever U.S. administration takes power in January 2009 will likely continue some variation on the current U.S. strategy. Indeed, such instincts are reasonable given the shortcomings of current international efforts to secure loose nuclear weapons and materials and to prevent the spread of nuclear weapons and materials to hostile or irresponsible states.

Russia, Pakistan, and North Korea loom as particularly acute concerns.[6] Russia retains several thousand nuclear weapons and enough nuclear explosive material to build many times more. Despite nearly two decades of cooperative efforts to strengthen security for those weapons and materials, the situation on the ground is uneven. Regular anecdotes of nuclear insecurity serve as reminders that Russia still has important gaps. Yet Russia has resisted many efforts to cooperatively upgrade its security, while also neglecting to invest sufficiently in unilateral security efforts.[7]

Pakistan is estimated to have several dozen nuclear weapons in its arsenal. The Pakistani government insists that it maintains strong security over its weapons and materials, and, given the prominence of radical elements in Pakistani society, it has every motivation to do so. Yet many U.S. officials and analysts remain concerned about the possibility that, if order in Pakistan were to break down, terrorists might be able to acquire a weapon or the materials to make one. While there has been some U.S.-Pakistan cooperation on security for nuclear weapons and materials, it is limited.

North Korea is believed to have as many as ten nuclear weapons. Its provocative behavior—first its purported threat in 2005 to transfer nuclear weapons, and later its nuclear explosive test in 2006—have focused analysts and policymakers on the need to deter nuclear transfers. It is engaged with the United States in intensive diplomacy that has led to partial disablement of its nuclear reactor and to the handing over of operating records for that reactor—which could potentially form the foundation for verifiable elimination of its nuclear arsenal. Yet many expect North Korea to insist on retaining at least enough material for several bombs. And there is enough uncertainty involved in accounting for North Korean plutonium that it may never be possible to definitively know whether it has fully disarmed. Moreover, unlike with the present Russian and Pakistani leadership, it is not entirely implausible that North Korean leaders would authorize the transfer of nuclear weapons to a terrorist group if they did not fear possible retaliation. The North Korean state maintains tight control over its people, but it has been willing to sell a variety of sensitive technologies to others. Its missile sales have long been an example of such irresponsible behavior; its recently discovered assistance with a covert Syrian nuclear reactor shocked most observers and raised fresh questions. The jump to sales of actual nuclear materials is large, but it is impossible to confidently conclude that there is any line the North Korean regime is unwilling to cross for the right price.[8]

Nuclear Attribution

These shortfalls compel policymakers to look at a range of ways to promote stronger security and more responsible behavior, and deterrence is an undeniable candidate to make an important contribution toward these ends. Nearly every approach to applying deterrence depends fundamentally on some ability to attribute nuclear weapons and materials to their physical sources. If weapons and materials cannot be attributed, targeted retaliation becomes impossible, and without the real prospect of retaliation, a deterrence strategy is worthless.[9] It is thus essential, before assessing strategic options, to understand the state, potential, and limitations of U.S. and international attribution capabilities. Much detail about U.S. attribution capabilities—the ability to trace the physical source of nuclear weapons or materials, through both technical and traditional means—is and will continue to be unknown publicly due to legitimate secrecy.[10] Several essential facts are, however, clear.

First, the United States has substantial attribution capabilities. It has invested in nuclear forensics—the science of extracting identifying information from nuclear materials—for roughly two decades. And it has significant information regarding the characteristics of foreign nuclear weapons and materials—so-called signatures—that, combined with technical and traditional forensic information, might be used to attribute nuclear weapons or materials to their sources.

Second, U.S. attribution capabilities are and will always be limited. A series of authoritative reports have called for increased investment in nuclear forensics, and, more importantly, have flagged incomplete signature databases as a fundamental limitation to U.S. capabilities.[11] While those reports have also identified opportunities for improving

attribution (through improvements in both technical capabilities and traditional means), they admit that anything close to perfection is an unreasonable goal. No future U.S. deterrence strategy can be based on the potential of near-perfect attribution.

Third, one of the most critical areas for improved attribution capabilities is an enhanced database of nuclear signatures. Creating that would require strong international cooperation, in which states would contribute information about their own nuclear assets as well as about others' stockpiles.

Fourth, even with perfect physical attribution, it is extraordinarily unlikely that the United States would be able to determine with certainty whether a given nuclear transfer was authorized by state leaders. Circumstantial evidence would help—for example, a transfer during a time of high tension is more likely to be intentional than one during peacetime—but no deterrence strategy should be based on an assumption that the United States will be able to confidently determine intent.

Deterring Lax Nuclear Security

No leader of any nuclear country other than North Korea has any meaningful incentive to deliberately transfer nuclear weapons or materials to a terrorist group.[12] (This should not be read to imply that North Korean leaders necessarily have strong incentives to transfer nuclear weapons or materials; that possibility is addressed in the next section. Nor should it be read to exclude the possibility that other states might pose threats of deliberate transfer in the future.) Any deterrence strategy directed against leaders of states other than North Korea, then, should be judged by how effectively it reduces the odds of a nuclear terrorist attack stemming, inadvertently, from lax nuclear security. Viewed through this lens, the best strategy for the United States is to avoid employing any variation on traditional deterrence. Instead, the United States should rule out retaliation and emphasize cooperation on nuclear security, while using other means to hold countries responsible for shortfalls in their security practices.

Why rule out retaliation? In many of the most important cases, a U.S. threat, even if credible, would do almost nothing to increase leaders' concerns about the possibility that their nuclear weapons or materials might fall into terrorist hands. At the same time, the prospect of U.S. retaliation could discourage security cooperation during peacetime, in the aftermath of a nuclear theft, and in the wake of a nuclear terrorist attack.

To the extent that leaders of countries like Russia or Pakistan find the threat of nuclear terrorism plausible, they are likely to see it as something that threatens themselves just as much as it threatens the United States. A threat to retaliate following an attack on the United States would thus do little, if anything, to shift the Russian or Pakistani

calculus: the possibility that terrorists might use nuclear weapons against Moscow or Islamabad is already far more motivation to pursue strong security than the possibility of U.S. action following a terrorist attack on the United States might be, particularly because a terrorist nuclear strike would inflict a far higher toll than any U.S. retaliatory action could.[13] (It is implausible, for example, that the United States would physically attack Russia; meanwhile, any nonmilitary retaliation would inevitably have a much weaker effect.) To be certain, there are states, such as Georgia or Kazakhstan, that have vulnerable nuclear materials and that lack internal terrorist threats to motivate them. But those states generally have far more cooperative relationships with the United States already—it is Russia and Pakistan in particular that pose acute security and cooperation problems that deterrence strategists seek to address.

Threat perception is, of course, not the only factor that affects states' approaches to nuclear security. In particular, countries can improve their security if they supplement their unilateral measures with cooperative security enhancements. Yet threatening to retaliate against a state following any attack that uses their materials would in many ways reduce its incentives to cooperate on security. Such threats would damage any atmosphere of cooperation. More concretely, cooperative security normally involves granting partners access to sensitive facilities, something that often runs into secrecy concerns. Since information gathered in the course of cooperation might be used to enhance a signature database—and hence to enable retaliation—incentives for secrecy, and thus noncooperation, would increase in the presence of deterrent threats.

U.S. threats will not only affect day-to-day decisions about security—they will also affect decisions in a crisis. The United States and others should want to encourage cooperation from a state's leaders if that state's security systems fail and nuclear weapons or materials escape its control. In particular, they will want that state's leaders to notify them of any major security failure so that they can mount an intensive effort to prevent an ensuing nuclear attack. Deterrent threats would likely undermine that goal.

How would decision-makers react to information that a weapon or a large quantity of nuclear material was missing from their country's facilities? They would certainly attempt to recover the weapon or materials themselves. But would they enlist others in the effort? Any possibility that the United States would punish a state for attacks stemming from negligent security practices would sharply discourage leaders of that state from notifying the United States of any actual security failure. Their only hope of avoiding retaliation would be to avoid having a leak attributed to their state—and notifying others that their nuclear material had gone missing would make that impossible. This places a high burden on any strategy that even leaves open the possibility that disclosing a nuclear theft might open a state to punishment.

The United States should make it as clear as possible that states will not suffer consequences if their leaders alert others to any theft of nuclear weapons or materials. It should do that not only by making public statements to that end, but also by encouraging other states that might be targets of a terrorist attack—and that hence might use disclosure of a theft to extract consequences later—to adopt the same posture. Tying the U.S. position to its allies would make that position more credible. It would also prevent others from undermining the U.S. position: if, for example, the United States ruled out punishing Russia for a leak but France did not, Russia might still fear identifying itself as the source of an attack by providing others with warning that a theft had occurred.

One might argue that states could be prodded even more to share information about thefts if the United States and others threatened consequences for failing to do so. Walking this line, though, would be prohibitively difficult, and could easily become counterproductive. Take Pakistan as an example. The United States would need a credible capability to attribute materials to Pakistan and a credible prospect of some significant punishment following attribution. It would, however, be extremely difficult to determine whether capable Pakistani officials had advance warning of a leak. At the same time, any threat would discourage Pakistan from providing access to nuclear facilities as part of cooperative security programs; would make it extremely difficult to

elicit Pakistani cooperation in the aftermath of an attack, in order to prevent further strikes; and would dissuade Pakistan from contributing to a nuclear signature database (though this particular prospect is likely remote in the near future.) The potential value of distinguishing this one case—state failure to notify others of a theft—is outweighed by the damage it would cause to broader security and attribution efforts.

For states other than North Korea, then, the United States would be best served by setting deterrent threats aside and instead focusing on cooperation, both in improving nuclear security directly and in enhancing attribution capabilities. That does not mean, however, that states should be absolved of responsibility for their nuclear security practices. The United States and others can hold Russia and Pakistan accountable for their day-to-day security practices through a myriad of other means: for example, the United States might tie its willingness to sell sensitive nuclear technologies to Russia to adherence to high security standards; might condition military sales to Pakistan on nuclear security efforts; or might more generally make clear that poor nuclear security practices will damage bilateral relations more broadly. What is essential, though, is that in the aftermath of any loss of nuclear materials—or even worse, following any nuclear attack—international focus is squarely on cooperation rather than confrontation.

North Korea: Traditional Deterrence Restored?

Much of the logic that applies to Russia, Pakistan, and others also applies to North Korea. The North Korean case is, however, fundamentally different, because there is a genuine possibility that North Korean leaders might intentionally transfer nuclear weapons or materials to a terrorist group if they did not fear possible retaliation.

To understand how best to use deterrence against North Korea, Cold War strategy is a useful starting point. Of all the states that possess nuclear stockpiles today, North Korea presents the threat that most closely resembles the one the United States faced from the Soviet Union during the Cold War.[14] There are certainly many differences: Among other things, North Korea does not have the ability to destroy the United States, nor does the conflict with North Korea carry the same global stakes that the Cold War did. Indeed a strategist confronting the possibility of a North Korean nuclear transfer must explore at least three differences from the classic Cold War case. First, U.S. attribution capabilities are less certain.[15] Second, the prospect of "accidental" attack during peacetime, while not unimportant during the Cold War, looms larger today, through the possibility of terrorist theft. Third, the possibility that an attack might be stopped before a detonation (if, for example, a smuggled weapon was intercepted before it reached its target) does not have a strong analogue in Cold War deterrence thinking.[16]

To understand the challenges involved in adapting deterrence to North Korean transfers of nuclear weapons or materials to terrorist

groups, this report steps through each of these changes from a baseline scenario and examines how they should affect U.S. strategy.

CERTAIN ATTRIBUTION, DELIBERATE TRANSFER, POST-DETONATION RETALIATION

Imagine, as a starting point, that any terrorist attack involving North Korean nuclear materials could be attributed to North Korea with certainty and was known to be the result of a deliberate decision by North Korean leaders. Also assume that, as in the Cold War, the focus of any deterrent threat is military retaliation in the aftermath of a detonation. What should U.S. declaratory policy be?

The standard threat made in the face of other possible forms of North Korean nuclear aggression, such as attacks with bombers or missiles, is one of overwhelming retaliation in response to an attack. Overwhelming retaliation might be nuclear or nonnuclear, and could be either punitive or aimed at regime change. Assuming that this is a sensible approach, the same threat would appear appropriate in the case of a terrorist detonation using North Korean weapons or materials, too.[17]

There is one important distinction: following such a terrorist attack, the United States may have an interest in obtaining North Korean cooperation in stopping any further attacks that are already under way using other weapons or materials that have previously been deliberately transferred. Compelling North Korean cooperation will require retaliation that is strong enough to maintain U.S. credibility but that is restrained enough to leave open the possibility of additional action if North Korean leaders do not cooperate in preventing further attacks. This would weigh against regime change as an appropriate response to a terrorist attack that used North Korean nuclear weapons or materials—that approach would leave North Korean leaders with no motivation to cooperate further. It suggests that retaliation be strong but limited.

UNCERTAIN ATTRIBUTION

This foundation, while a useful start, is based on several incorrect assumptions. In particular, how should strategists correct for uncertainty in U.S. ability to attribute attacks? The United States has two basic choices. It can place the burden of proof squarely on itself, maintaining the same approach as it would with certain attribution, threatening retaliation if and only if nuclear weapons or materials used in an attack can be unambiguously traced back to North Korea. Alternatively, it can split the burden of proof, explicitly stating that it would be willing to retaliate on the basis of very strong evidence, even if it lacked certain attribution. This second option, approached properly, is best.

The odds of the United States obtaining absolutely unambiguous attribution are very low. That, in turn, makes a threat that is conditioned on absolute certainty of marginal value. Lowering the bar slightly to admit retaliation under more ambiguous circumstances would deliver additional returns that would outweigh the associated risks.

The credibility of any U.S. threat will depend on two things: whether North Korean leaders believe that there is a substantial chance that the United States will be able to attribute nuclear material to them with significant confidence, and whether the United States is perceived as willing to retaliate on the basis of strong but still imperfect information. In contrast with the cases of Russia and Pakistan, the United States is believed to have relatively strong capabilities to attribute North Korean nuclear materials, stemming in part from its access to information gathered through extensive International Atomic Energy Agency inspections.[18] As a result, the first requirement for effective deterrence—having significant attribution capabilities—should not present problems.

Fulfilling the second requirement—ensuring that North Korean leaders believe the United States would respond based on strong but still ambiguous information—depends on making sure that they believe that the United States would be willing to risk North Korean counter-retaliation against U.S. allies in the region.[19] To make the U.S.

threat more credible, the United States should work with its allies and partners in the region (notably South Korea and Japan, but also China) to develop common standards for making attribution assessments and for judging whether it is wise, in any given circumstances, to retaliate against North Korea. The United States would undoubtedly feel constrained by its allies and others regardless of whether it had deliberately developed any common understanding; working on a common approach, then, would not significantly restrict U.S. freedom of action. (In any case, the United States could be clear that in the case of an attack on U.S. soil, the president would ultimately decide alone whether to retaliate.) This approach would also be attractive to U.S. allies, as it would give them some influence over U.S. decision-making.

The main danger involved in retaliating in the face of compelling but imperfect evidence is the possibility that U.S. retaliatory action would provoke Pyongyang. This must be weighed, though, against the fact that U.S. inaction in the face of a North Korean nuclear transfer would encourage Pyongyang to continue transfers of weapons and materials. Ultimately, the president will need to balance these two objectives and make a judgment in the context of any nuclear attack that occurs. Assuming that there is no ambiguity about North Korean intent, if the United States is confident though not certain that North Korea is responsible for an attack, retaliation will generally be the best course.

UNCERTAIN INTENT

Uncertainty surrounding attribution is, of course, compounded by uncertainty regarding North Korean intent. How should this affect U.S. strategy? This presents more difficult problems than uncertainty in physical attribution does. The United States could place the burden of demonstrating intent on itself, declaring that it will retaliate only if it believes that a transfer was intentional. Alternatively, it could state that it will not distinguish between cases of authorized and unauthorized transfers, declaring that either is the result of irresponsible behavior.

The United States would thus threaten to retaliate in response to any nuclear detonation that can be traced to North Korea. This second option is wisest.

A policy that allows for retaliation only if the United States is certain that an attack is the result of an intentional transfer will be a very weak one, since the odds that the United States will be able to unambiguously determine intent are extremely low. That, in turn, would introduce a large loophole and deeply undercut any threat to retaliate following even an authorized transfer.[20] This suggests that the second option—declaring that the United States will not distinguish between authorized and unauthorized transfers—would be better. In particular, adopting this approach would maintain a clear signal that the United States would retaliate militarily in the face of an authorized transfer, just as it would if faced with a North Korean missile or bomber attack.

To be certain, such an approach carries important risks. Imagine a scenario in which a nuclear detonation results from an unauthorized transfer of North Korean plutonium, and the United States retaliates: that retaliation would risk provoking North Korea to take aggressive actions that it otherwise might not have. Other factors would, however lessen this risk. In particular, following initial retaliation from the United States, North Korea could choose to clamp down on nuclear security and not counterretaliate, confidently avoiding further U.S. action.

Putting together two layers of uncertainty—over the source of any attack and over the intent behind it—leads to a new way of thinking about declaratory policy. The United States should threaten to retaliate if it and others find the evidence linking an attack to North Korea compelling, regardless of whether the nuclear transfer at its root was authorized or unauthorized. Such retaliation should not cross the nuclear threshold and should be aimed at military and industrial targets that the North Korean regime values, rather than at civilians, ensuring that the response leaves Pyongyang with a strong incentive not to escalate as well as to cooperate in any efforts to prevent further attack, while making the retaliation morally justifiable. At the same time, the United States should work with its partners in the region to establish

agreement on this posture and to develop procedures and standards for determining whether a given attribution is strong enough to merit retaliation.

PRE-DETONATION INTERCEPTION

The logic and strategy just outlined assumes that, as in the Cold War, retaliation follows a nuclear attack; it also assumes that initiating an attack is essentially tantamount to completing it. There is a significant possibility, however, that a nuclear terrorist attack might be stopped after a group acquires nuclear weapons or materials but before a bomb is detonated.[21] How should that affect U.S. strategy?

An argument can be made for retaliating in such a situation—in the aftermath of a thwarted attack—since retaliation would send a signal to North Korean leaders to not engage in further transfers and to ratchet up internal North Korean security. At the same time, making no distinction between the pre- and post-detonation cases would introduce several problems. First, a threat to retaliate militarily absent an actual terrorist detonation would be less credible simply because public appetite for retaliation would be lower. Second, choosing not to distinguish between pre- and post-detonation retaliation removes important incentives for North Korea to cooperate following loss of control over nuclear weapons or materials—if Pyongyang discovers that nuclear weapons or materials are missing, and it believes that it will suffer less if a detonation is prevented, it will have an incentive to help the United States track down the missing weapons or materials, in turn lessening the likelihood of an explosion.

Indeed, one might be tempted to take that observation further: Threatening retaliation in response to unauthorized nuclear transfers might, as in the cases of Russia and Pakistan, actually undermine U.S. security, by discouraging North Korean leaders from alerting others if they discover that weapons or materials have gone missing. The specifics of the North Korean case, however, make this far less problematic.

U.S. ability to attribute attacks to states like Russia and Pakistan is relatively poor—as a result, if those states' leaders discover that materials are missing, they have a reasonable prospect of hiding their country's roles by choosing to not inform others. North Korean leaders do not, however, share the same good fortune, because U.S. attribution abilities vis-à-vis North Korea are likely much stronger. This substantially lessens the value to North Korean leaders of keeping quiet if they discover a leak; that, in turn, makes ruling out retaliation in the case of an unauthorized transfer less useful to the United States as a way of promoting cooperation.

What does this imply for U.S. declaratory policy options? The United States should make clear that it will hold North Korea accountable if it has high confidence that a well-developed terrorist plot—complete or not—involves North Korean nuclear materials or weapons, regardless of how terrorists acquired them. But it should also be clear that the consequences following an actual detonation would be far greater than those following an intercepted but incomplete attack. This would maintain the strong disincentives that North Korean leaders currently have to transfer nuclear weapons or materials. At the same time, it would increase the odds of cooperation in the unlikely event of an unauthorized transfer, since North Korean leaders might spare themselves relatively harsh retaliation by cooperating in preventing an attack from being completed.

IRAN

Iran, if it acquires nuclear weapons or weapons materials, will present a challenge similar but not identical to North Korea's. Most importantly, Iranian leaders, like North Korean leaders, might choose to transfer nuclear weapons or materials to terrorist groups if they do not sufficiently fear consequences; Iran, with its close ties to several terrorist groups, would probably present a greater threat than North Korea does. This suggests that the United States should take a similar approach to Tehran as is does to Pyongyang.

The two situations differ, however, in two important ways. The Iranian leadership is less unitary than the North Korean leadership, which increases the possibility of transfers that are not authorized at the top. In addition, U.S. capabilities to attribute nuclear materials to Iran may be much weaker than those that it has for attributing materials to North Korea.[22] Careful balancing and integration of these factors into U.S. strategy will need to happen if Iran acquires nuclear weapons or weapons materials, but cannot be done properly now, when the United States does not know the full context in which future strategy would exist. Nonetheless, some basic guidelines are straightforward and useful.

Compared to North Korea, the greater possibility of unauthorized transfer, combined with the likelihood that U.S. attribution capabilities will be relatively weak, suggests that elements of the strategy recommended for states like Russia and Pakistan may be desirable. In particular, it may be valuable for U.S. declaratory policy to distinguish carefully between cases of authorized and unauthorized transfers, in order to encourage one element of the Iranian government to alert other governments if it becomes aware that another element has transferred nuclear weapons or material to a terrorist group. At the same time, the real possibility of authorized transfers weighs against this distinction for the same reason that arises in the North Korean case: it is difficult in practice to tell the difference between authorized and unauthorized transfers. By admitting the possibility of restraint in cases where it cannot determine intent, the United States would undermine its threat to retaliate against authorized transfers.

If the United States is able to develop strong attribution capabilities against Iran, then, as in the North Korean case, the wisest policy will most likely be one that does not distinguish between authorized and unauthorized transfers. If, however, U.S. attribution capabilities are weak, policymakers will need to recalibrate their policy based on those capabilities as well as on their assessment of how strong the central Iranian leadership is. If there is a significant chance of an unauthorized nuclear transfer by hostile elements of the Iranian government, and the United States worries that other parts of the Iranian leadership, de-

spite its best efforts, may be too weak to confidently prevent such transfers, it may want to relax its declaratory policy in order to promote cooperation with those less hostile elements of the Iranian regime.

All of this also indicates that using deterrence to contain Iran is likely to be far more difficult than in the case of North Korea. This indicates the great value of stopping Iran from acquiring nuclear weapons or weapons materials, even if the world is unable to stop Iran from acquiring the means to produce them.

DECLARATORY POLICY: A SUMMARY

The approach to declaratory policy outlined here and in the previous section shares some features in common with current strategy but also differs in important ways. The United States should clarify a new policy along three simple lines. This declaratory policy may, of course, need to evolve in the future as states' capabilities, leaders, and relationships with the United States change.

First, the United States should declare to those with which it is engaged in cooperative nuclear security efforts—right now, essentially all countries, including Pakistan and Russia—that while it will continue to hold those states responsible for their day-to-day nuclear security practices, it does not, as a general matter, intend to retaliate in any way against them for transfers (presumably unauthorized) of nuclear weapons or materials.[23] This is a clear departure from current policy, and reflects a recognition that plausible threats of retaliation add little to the incentives most leaders have to improve nuclear security, while at the same time acknowledging that retaliatory threats, whether military or otherwise, undermine essential opportunities for cooperatively preventing nuclear terrorist attacks. At the same time as it establishes this policy, the United States should emphasize the importance it places on states notifying others if they discover nuclear weapons or materials missing, and cooperating in promptly recovering such materials.

Second, the United States should publicly reaffirm that it will hold North Korea accountable for transfers of nuclear weapons or materials to terrorist groups, regardless of whether such transfers are explicitly authorized by top North Korean leadership. This is consistent with current policy. In doing this, the United States should acknowledge that it will never have perfect attribution, but be clear that it will be willing to act on very strong but still imperfect information. If the United States were operating alone, it would also want to leave the set of retaliatory options wide open, including by allowing for the possibility of regime change, in order to maximize the effectiveness of its threats.

In order to reassure other states whose cooperation it may need in attributing any attack, however, the United States will likely need to be clear that in the face of uncertain attribution, any retaliation will be limited to the overwhelming use of conventional force directed at military targets, and, in particular, will not include nuclear arms. This is distinct from current policy. In practice, as argued earlier, the United States will also likely want to restrain itself in any response following an actual attack. That observation alone, however, is not reason enough to scale back the initial U.S. threat.

Third, the United States should communicate privately with North Korean leaders that while incontrovertible evidence that a nuclear transfer was not authorized may weigh against a U.S. decision to retaliate, North Korean leaders should expect a strong U.S. response regardless of what explanation Pyongyang offers for a nuclear leak. At the same time, the United States should be clear that if North Korea shares information about missing weapons or materials that helps the United States prevent an attack, it will suffer lesser consequences. (These might, for example, be economic rather than military, though it is probably not useful for U.S. leaders to engage in such a fine-grained conversation.) This is largely consistent with current policy, though such policy is somewhat unclear.

Improving Attribution

Many authors have proposed ways to improve attribution, either through unilateral data gathering and analysis or by sharing information with other countries.[24] The approach to deterrence just outlined for Russia, Pakistan, North Korea, and others has implications for how the United States should focus efforts to improve its attribution capabilities.

Attribution efforts should not, in most cases, be aimed at directly bolstering a new deterrence strategy. This is true simply because deterrence is the wrong tool to be using against most countries. Instead, attribution efforts can focus on two goals. First, they should be designed to enable both unilateral and cooperative measures aimed at preventing follow-on attacks in the aftermath of a nuclear detonation by helping pinpoint the source of any attack.[25] Freeing up most countries from threats of retaliation will help encourage the information sharing involved in such efforts.

Second, and of greater direct relevance here, U.S. efforts should be aimed at improving attribution against North Korea. The United States already has substantial abilities to attribute nuclear weapons or materials to North Korea, as it has had access to the main known North Korean nuclear facilities at Yongbyon for many years, and has likely accumulated samples of North Korean nuclear materials.[26] The greatest ambiguity in attributing any material to North Korea likely comes from the fact that North Korean reactor design is replicated in many other places in the world, complicating efforts to positively identify the source of any materials.

Building better capacity to exclude other countries with similar facilities as sources of materials would thus be invaluable. This can best

be done cooperatively, by having others contribute to a database of nuclear sources—and by adopting a declaratory policy that does not threaten most countries, the United States would enhance its ability to build an effective database.[27] Beyond that, if countries fear that a comprehensive database will enable a deterrence approach with which they disagree—for example, if they fear that U.S. threats against North Korea are reckless—they will be reticent to share information, which would in turn weaken deterrence. That implies that the United States, as a central part of its efforts to build a nuclear signature database, should work with other countries to coalesce around agreement on the basic features of an acceptable deterrence policy. In doing this, the United States will need to be flexible in how it approaches deterrence.

Credibility has also emerged as a central issue in establishing effective deterrence against North Korea. Most analysts have focused on improving actual U.S. attribution capabilities, but the perception of U.S. capabilities is even more important. To that end, the United States should devote a substantial effort to attributing even minor amounts of smuggled nuclear materials, which are intercepted on a fairly regular basis, and to publicizing its results. With the right capabilities, the United States could build a strong track record of successful attribution.[28] Such discrete and visible real-world successes are more likely to affect others' calculations than descriptions of technical advances.

There is a significant danger, of course, that this approach could backfire: If a concerted effort to demonstrate U.S. capabilities failed to attribute a substantial number of thefts, U.S. credibility would actually be weakened. This means that the United States will need to invest strongly in actual attribution capabilities. It also suggests that cooperation from the most frequent sources of nuclear materials will be valuable, as that will increase the odds of successful demonstration. That further compounds earlier arguments against making those states targets of a retaliatory policy.

It will also be important to continually improve actual post-detonation attribution capabilities for other reasons. This is particularly true in the case of North Korea. An ambiguously effective attribution capability might deter North Korea from deliberate transfers. But

if North Korea nonetheless transfers materials, failure to attribute the attack would massively undermine any attempt to prevent further detonations. Strong post-detonation attribution will also be essential to avoid retaliation against the wrong target. In the aftermath of an explosion, there will be enormous pressure from the American people to retaliate against someone; a capability that is at least able to rapidly exclude most states as possible sources could avert tragedy.

While the United States works to strengthen perceptions of its ability to attribute attacks, it must also avoid overstating its capabilities. The pressure on a U.S. president to retaliate promptly in the aftermath of an attack would only be intensified if the American people believed that their government had exceptional capabilities to identify the sources of an attack. If that pressure led to hasty U.S. action, it could catalyze what might otherwise be an avoidable conflict. The United States must communicate that there is a high chance of successful attribution, but it should always be very clear that there is a real possibility that it will not be able to attribute an attack.

Indeed the rush to transform Cold War deterrence into a weapon against nuclear terrorism opens the door to a host of unintended yet dangerous consequences. Wielded wisely, a new twist on deterrence can make important contributions to strengthening nuclear security. But applied incautiously and indiscriminately, it could deeply undermine efforts to that same end.

Endnotes

1. The possibility that deterrence might be used directly against terrorist groups, rather than just against state supporters, has also received renewed interest, but is beyond the scope of this report. See Eric Schmitt and Thom Shanker, "U.S. Adapts Cold-War Idea to Fight Terrorists," *New York Times*, March 18, 2008.
2. See, for example, Jay Davis, "The Attribution of WMD Events," *Journal of Homeland Security*, April 2003; Michael A. Levi, "Deterring Nuclear Terrorism," *Issues in Science & Technology*, Spring 2004. The author's present conclusions differ in important ways from his earlier judgments in the article cited.
3. See, for example, David E. Sanger and Thom Shanker, "U.S. Debates Deterrence for Nuclear Terrorism," *New York Times*, May 8, 2007.
4. Many U.S. policymakers had been skeptical of a blanket threat, which they feared could complicate relations with partners and allies like Russia and Pakistan. Sanger and Shanker, "U.S. Debates Deterrence for Nuclear Terrorism."
5. The phrase "overwhelming force" is often used in declaratory policy to suggest a nuclear response while maintaining some ambiguity.
6. See, for example, Siegfried S. Hecker, "Toward a Comprehensive Safeguards System: Keeping Fissile Material out of Terrorists' Hands," *Annals of the American Academy of Political and Social Science*, vol. 607, September 2006.
7. See Matthew Bunn, *Securing the Bomb 2007* (Cambridge, MA, and Washington, DC: Project on Managing the Atom, Harvard University, and Nuclear Threat Initiative, September 26, 2007) for detail.
8. Russia has also sold missiles and a nuclear reactor to Iran, but the missiles have not been long-range or nuclear-capable, and the reactor sale, while objectionable, has at least been overt.
9. Some have suggested the United States simply threaten some group of problem states (or, often, only North Korea) with retaliation if there is a nuclear terrorist attack on the United States, regardless of whether the source of the attack can be traced. This avoids the need for attribution capabilities, but is irresponsible and unethical—retaliation against an innocent state could unnecessarily provoke war and kill innocents for no reason. It is, as a result, not a credible strategy either.
10. Some define attribution more broadly, including the ability to determine whether weapons or materials were transferred intentionally to unauthorized individuals; this report treats that determination separately.

11. For example, Michael M. May et al., *Nuclear Forensics: Role, State of the Art, Program Needs* (Washington, DC: AAAS Center for Science Technology and Security Policy, February 2008).
12. This includes, in particular, the present leadership of Russia and Pakistan; a nuclear Iran would likely join North Korea as an exception, as might Pakistan under radical leadership.
13. This argument holds regardless of whether Russian or Pakistani leaders perceive a serious threat from terrorists—what matters is that a U.S. threat to retaliate would not increase their fears.
14. Iran might present a similar threat in the future, as could Pakistan under different leadership. The best approach to deterring them from transferring weapons or materials to terrorist groups would need to be determined within whatever future context deliberate transfers from those states became acute threats; an analytical approach similar to that used here for North Korea would need to be applied.
15. The United States remained concerned throughout the Cold War that the Soviet Union might attempt a clandestine attack; traditional deterrence, though, was not aimed at that threat.
16. During the Cold War, attacks by bombers might have been turned away before being completed. Deterrence theory focused primarily on missiles, though, and despite large investments in missile defenses, most deterrence thinking still emphasized situations where launching an attack implied succeeding in it.
17.This report does not consider the possibility that this is not a sensible policy for traditional attacks using bombers or missiles. To do that would involve a fundamental reexamination of deterrence far more broadly, something that is well beyond the scope of this report.
18. Sanger and Shanker, "U.S. Debates Deterrence for Nuclear Terrorism."
19. One might imagine that other moral constraints might enter here, too, but that would only be the case if the United States, unnecessarily, focused its retaliation on civilian targets or on targets where many civilians would be killed incidentally, or if the United States retaliated using its own nuclear weapons.
20. It would also lessen pressure on North Korea to strengthen security of its weapons and materials; such security is, however, already likely to be high, making this of, at most, marginal importance.
21. For an extended review of possible ways in which plots might fail during these stages, see Michael Levi, *On Nuclear Terrorism*, (Cambridge, MA: Harvard University Press, 2007).
22. U.S. capabilities against Iran will evolve over time; it is impossible to know now how strong they will be if and when Iran acquires nuclear weapons or weapons materials. That information would also depend on the amount of access that the United States has to IAEA inspection data on Iran, and on the extent of future IAEA access to Iranian facilities, neither of which can be known in advance.
23. If, in the future, the United States adopted a strategy that admitted retaliation against Pakistan as a possibility, it would need to carefully consider a variety of retaliatory options. Since the strategy proposed here involves ruling out retaliation, an assessment of different targets is unnecessary.
24. For a range of proposals, see Michael May and Jay Davis, "Preparing for the Worst," *Nature*, vol. 443, October 26, 2006; May et al., *Nuclear Forensics*; and references therein.

25. For a discussion of preventing follow-on attacks, see Ashton B. Carter et al., *The Day After: Action in the 24 Hours Following a Nuclear Blast in an American City* (Cambridge, MA: Preventive Defense Project, May 2007).
26. It has also gained information about North Korean materials through collection of radioactive debris following the North Korean nuclear test in October 2006, and can probably infer more about the North Korean stockpile from documents describing the plutonium production history of Yongbyon that were handed over in spring 2008.
27. For other challenges in building a database, see May and Davis, "Preparing for the Worst."
28. This is a distinct challenge from postattack attribution, but it involves many of the same difficult tasks.

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