

Why Nuclear Smuggling Matters

by Rens Lee

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Abstract: Nuclear leakage from the Newly Independent States of the former Soviet Union is an ongoing national security concern of the United States. While little weapons-usable material and no nuclear warheads have surfaced in international smuggling channels, observed data from seizures and arrests are not necessarily representative of the wider universe of illegal nuclear deals. Political and economic upheavals and associated nuclear security problems in Russia in the 1990s accentuated the risk of serious proliferation episodes. Adversaries such as Iran and Al Qaeda have tried to exploit these vulnerabilities to further their nuclear ambitions, although with uncertain results. Improved intelligence collection on the nuclear black market—who the players are, what items they seek, how they plan to obtain them and how successful they have been—should complement the essentially reactive and stationary risk management systems now in place in Russia and elsewhere.

Visible and Shadow Markets

The dissolution of the USSR 16 years ago triggered concerns that fissile materials and even complete nuclear weapons would escape from poorly secured stockpiles and gravitate into dangerous hands. Yet the shape of the nuclear leakage threat remains ill defined and somewhat hypothetical. A black market in nuclear and radiological materials emerged in the wake of the Soviet collapse—evidence of disarray within post-Soviet nuclear establishments—but this phenomenon provides few clues to what might have happened. Little material of direct military significance (at least for a fission weapon) and no nuclear warheads have surfaced in international smuggling channels. Low-grade uranium and assorted radioactive sources account for most of the flow. Total seizures of HEU in uranium-235 equivalent and plutonium, respectively, in the period 1992 to 2006

amounted to about 9.4 kilograms and a little less than a pound—not enough for a bomb.¹

Moreover, the illicit nuclear trade in its visible guises does not display characteristics of a true market. In the above-mentioned incidents evidence of a connection to any bona-fide buyer—whether a state seeking nuclear weapons, a terrorist group or a criminal entity—was extremely slim. Most of the episodes in question were sting operations initiated by law enforcement or intelligence agencies; in others, perpetrators were trapped by security forces while casting around for a buyer. As a result, some analysts have dismissed nuclear smuggling as more of a minor international nuisance than a first-order threat to the current non-proliferation regime.

Other explanations, though, view this apparently anemic and supplier-driven traffic in more ominous terms. Observed data from confirmed smuggling incidents and associated seizures and arrests are not necessarily representative of the wider universe of black market nuclear deals, including sophisticated schemes that escape scrutiny. As with other illegal commodities—drugs for instance—what is captured probably represents just a fraction of what is available in the international marketplace. For example, the small (usually multi-gram) quantities of HEU and plutonium intercepted by authorities suggests that traders planned to show prospective customers samples of what could be larger inventories of privately-held material. Even kilogram-sized lots appearing in the black market may represent the tip of the proverbial iceberg. For instance, according to a Czech police investigation of a 1994 seizure in Prague of 2.7 kilograms of Russian-origin HEU, smugglers claimed they could deliver to buyers an additional 40 kilograms of HEU in the short term and 5 kilos each month over the next 12 months.² Where this vagabond material, if it really existed, is now anyone's guess.

Furthermore, the basic preconditions of a true market—would-be sellers and interested buyers—appear to be present. In Russia, the post-cold war loss of government orders for nuclear goods, weakened security controls, and the economic desperation faced by the Russian workforce, set the stage for a dangerous proliferation dynamic. As then-senator Sam Nunn told a Senate hearing in 1995, the former Soviet Union was a “vast potential supermarket for nuclear weapons, weapons grade uranium and plutonium and equally deadly

¹ Data calculated from the Institute for International Strategic Studies. *Nuclear Black Markets: Pakistan, A.Q. Khan and the Rise of Proliferation Networks*. London IISS, May 2007, p. 125. Data include 14 incidents confirmed by the International Atomic Energy Agency and four “highly credible” incidents from the Salzburg Database on Nuclear Theft, Smuggling and Orphan Radiation Sources at the University of Salzburg.

² Czech police officer Jan Rathauský et al. cited in Rensselaer Lee *Smuggling Armageddon: The Nuclear Black Market in the Former Soviet Union and Europe* (New York: St Martin's 1998), pp. 94, 101-102.

chemical and biological weapons.”³ The literally hundreds of attempted thefts of nuclear and radiological materials at post-Soviet nuclear enterprises, especially in the 1990s, is ample evidence of proliferation pressures on the supply side. In one revealing 1998 incident, suggestive of a highly unstable security climate, Russian security officials reportedly foiled a plot by “staff members” of a Chelyabinsk nuclear facility to steal 18.5 kilograms of HEU which, depending on the level of enrichment, could be almost enough for an atomic bomb.⁴

Likewise, on the demand side, intelligence reporting, media accounts and other sources indicate that a handful of nation states and sub-national groups have been—or currently are—“in the market” for stolen nuclear goods. Over the years, Iran, Saddamist Iraq, and possibly North Korea have tapped into the nuclear black market, though details are murky, and Iran’s efforts seem to be ongoing.⁵ Nation states are likely to place a premium on self-reliance in weapons development—witness Iran’s high-profile enrichment program—but this does not preclude shopping for fissile materials to accelerate the time-frame for a bomb. Among sub-national groups, Al Qaeda and (in the 1990s) the Japanese Aum Shinrikyo cult have most consistently demonstrated an interest in acquiring a nuclear capability, including a complete nuclear weapon via black market channels. Osama bin Laden, in an oft quoted statement, called the acquisition of nuclear weapons for the defense of Muslims a “religious duty,” leaving little doubt of his WMD intentions.⁶

Finally, the ostensible lack of clear market relationships in observed nuclear smuggling activity may be unrepresentative of the true state of affairs. That is, purveyors of strategic nuclear wares may be converging with customers in ways not readily apparent to western intelligence or security officials. The prime example of such a “shadow market” in the nuclear realm was the notorious marketing network for nuclear weapons technology set up by Pakistani scientist A. Q. Khan. The network, which sold centrifuges, centrifuge components, uranium hexafluoride gas, and nuclear weapons designs to various adversary nations, operated for about 15 years (from the late 1980s to early 2004) before being shut down by a joint U.S.-U.K. intelligence effort.⁷

³ Cited in James L. Ford and C. Richard Schuller, *Controlling Threats to Nuclear Security*. (Washington: National Defense University Center for Non-Proliferation Studies. 1997), p. 3.

⁴ Yevgeniy Tkachenko FSB Agents Prevent Theft of Nuclear Materials *ITAR-TASS*, December 18, 1998 and “MINATOM Official Says 1998 Theft in Chelyabinsk Involved HEU,” Center for Non-Proliferation Studies NIS Nuclear Trafficking Data Base, October 30, 2000.

⁵ The German news magazine *Stern* in March 1993, citing Russian counterintelligence sources, reported that North Korea had smuggled out of Russia some 56 kilograms of plutonium, enough for 7 to 9 atomic bombs. See Larry Niksch. "North Korea's Nuclear Weapons Program" Congressional Research Issue Brief 1891141, November 10, 2004, p.10. The report has not been confirmed. On Iraq, see Khiddir Hamza *Saddam's Bombmaker*. (New York: Scribner, 2000), Chapter 11. These efforts, which focused on Western Europe in the 1980s, were apparently unsuccessful. On Iran, see discussion below.

⁶ “Conversations with Terror” *Time*, January 11, 1999, p. 39.

⁷ *IISS Nuclear Black Markets*, pp. 7, 68.

Conceivably, a Khan-type network dedicated to covert sales of weapons-usable materials could take shape on the territory of the former Soviet Union, managed by corrupt elements within the nuclear establishments of Russia and other newly independent states.

A Diminishing Threat?

A widespread consensus holds that Russia's nuclear security posture has changed for the better in recent years, even if it remains less than fully mature by U.S. standards. Some encouraging signs seem to validate this consensus. Thefts and attempted thefts of nuclear materials have been declining, at least according to Russian atomic energy officials.⁸ Moreover, quantities of HEU and plutonium offered for sale internationally, never voluminous, have declined substantially. Of the 18 above-mentioned smuggling incidents involving weapons-usable material, only three have occurred in this decade. A relatively buoyant Russian economy (which has grown an average of 6.6 percent since 1999) and stronger central control over the nuclear complex partly explain this change. Also important has been an array of U.S.-funded programs designed to prevent the intentional leakage and illegal export of fissile materials, including security upgrades for materials and warhead storage sites, as well as technological monitoring systems at borders to interdict radioactive contraband.

These positive trends, however, beg the question of what might have happened in the 1990s—a time of extreme hardship within the Russian nuclear complex—when modern safeguards technology had not yet been widely introduced. For example, at the end of the decade, security enhancements under the Department of Energy's Materials Protection, Control and Accounting program had been completed at fewer than one-third of the Russian building sites believed to house weapons-usable HEU and plutonium. Completion at all targeted sites is scheduled for year-end 2008 and deployment of radiation detectors at border crossings, mostly in Russia, is expected to extend into the next decade. These programs have an intrinsic threat-reduction value, but by this time—some 16 years after the USSR's collapse—some nuclear material of consequence could have fallen “outside whatever improved fences and security barriers may now be installed” and become available for sale.⁹

A related problem of the 1990s concerns the status of former Soviet inventories of nuclear weapons. Weapons are generally believed to be better guarded than their fissile material counterparts. However, when the Cold War

⁸ National Academy of Sciences *Strengthening, Long Term Nuclear Security: Protecting Weapons-Usable Material in Russia*. (Washington: National Academies Press, 2005), p. 12.

⁹ Matthew Bunn, *Securing the Bomb 2007*, (Cambridge, Mass. Harvard University Belfer Center for Science and International Affairs, September 2007), pp. 53, 64.

ended and the Soviet Union disintegrated, tens of thousands of tactical nukes of various descriptions—from short range missiles to atomic demolition mines—remained on the territory of most of the new post-Soviet states. These weapons were supposed to have been shipped back to Russia by mid-1992, but some observers are skeptical. As Harvard scholar Graham Allison observes “Under the most favorable circumstances, DHL or Federal Express would find it challenging to move so many items from so many sites in so little time without losing any.”¹⁰ Moreover, persistent reports have circulated over the years. Some weapons were deliberately withheld by the new republics. For instance, an unconfirmed April 2006 report in the independent newspaper, *Novaya Gazeta*, claimed that Ukraine had failed to return some 250 nuclear warheads to Russia after the Soviet collapse, and hinted that a number of them could have been sold to third countries, including Iran.¹¹

Meanwhile, the visible black market for nuclear materials continues to draw international attention, despite evidence of reduced activity. For example, in June 2003 an Armenian smuggler was captured at the border with Georgia carrying 170 grams of HEU. The material was enriched to 89 percent U-235, close to the standard used for nuclear weapons (above 90 percent). In early 2006, a Russian (North Ossetian) trafficker was apprehended in a sting operation in Georgia with 100 g of HEU also enriched to 89 percent. Whether the two shipments were part of the same cache is not known. The smuggler told Georgian authorities that he had access to an additional two to three kilograms of the same material, but this claim was not verified. A *New York Times* account of the incident observed that “the case has alarmed officials, because they had thought that new security precautions had tamped down the nuclear black market that developed in the 1990s . . .” However, in both of the above cases, there is a strong likelihood that the material leaked out years earlier, before the safeguards were fully in place, and then stashed while the perpetrators looked for a buyer.¹²

Iran, Al Qaeda and the Bomb

At this juncture, the conclusion seems warranted that nuclear leakage, including deliberate clandestine transfers of fissile material, is not just a threat

¹⁰ Graham Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Henry Holt 2004), pp. 68-69 Allison uses a figure of 22,000 weapons spread around 14 of 15 former Soviet states.

¹¹ “Russian Military Stalls on Reports Ukraine Sold Warheads to Iran” *RIA Novosti*, April 5, 2006. The head of the Russian General Staff, Yuriy Baluyevsky, refused to confirm or deny the report.

¹² Lawrence Scott Sheets and William Broad “Smugglers’ Plot Highlights Fear over Uranium,” *The New York Times*, January 25, 2007 www.nytimes.com/2007/01/25/world/europe/25nuke.html IISS *Nuclear Black Markets*, p. 128.

but a reality. The extent and significance of such transfers cannot be precisely calibrated. The cases of Iran and Al Qaeda—adversaries of greatest current concern—suggest a plausible link between smuggling and proliferation, even if no definitive evidence exists that either has obtained a weapon or the means to make one through smuggling channels.

The link is especially obvious in the case of Al Qaeda, since for non-state actors smuggling is practically the sole pathway to a nuclear capability. The group is believed to have sought HEU (apparently unsuccessfully) in various venues—Africa, Western Europe, and the former Soviet Union—since the early 1990s. The group appears to have been victimized by scam artists offering low-grade reactor fuel and radioactive trash, useless for making fission weapons. Possibly of greater import are its efforts to acquire a complete nuclear weapon. Stories circulated in 1998 that bin Laden offered a Kazakh arms dealer two million pounds for a weapon, and that Al Qaeda actually bought 20 tactical nuclear warheads from the “Chechen mafia” for \$20 million and two tons of opium.¹³ Also, former CIA director George Tenet recounts in his book, *At the Center of the Storm*, that the agency in 2001 had received “a stream of reliable reporting” that senior Al Qaeda leaders in Saudi Arabia had been negotiating for the sale of three Russian tactical nuclear devices.¹⁴

Al Qaeda’s leaders have not been shy about claiming success in its nuclear ventures. Bin Laden announced in a late 2001 interview that “we have chemical and nuclear weapons as a deterrent” and his deputy Ayman al Zawahiri told the same correspondent in 2004 that the group had succeeded in purchasing some “suitcase” nuclear weapons, and that such items were widely available on the “black market” in Central Asia.¹⁵ Most observers are skeptical of such claims, citing the group’s technical inexperience, its pariah status, the failure to detonate such a weapon and other factors. Importantly, an extensive search of government buildings, military compounds, terrorist camps, safe houses and the like in the wake of Operation Enduring Freedom found no trace of fissile materials or a weapon.¹⁶ Predictable denials have come from Russia: then Russian president Vladimir Putin stated in a 2002 interview that he was “absolutely confident” that terrorists in Afghanistan do not possess Soviet or Russian weapons of mass destruction.¹⁷ Nevertheless, Al Qaeda’s evident

¹³ Riyadh Alam al-Din et al., “Report Links Bin Laden, Nuclear Weapons,” *Al-Watan al-Arabi*, November 13, 1998, p. 20-21, Marie Colvin, “Holy Warrior with U.S. on His Sights—Focus—Bomb—Profile—Osama bin Laden,” *The Sunday Times*, August 16, 1998. global.factiva.com/en/arch/display.asp.

¹⁴ George Tenet, *At the Center of the Storm*, (New York: HarperCollins 2007), p. 272.

¹⁵ Sara Daly et. al. *Aum Shinrikyo, al Qaeda and the Kinsbasa Reactor: Implications of Three Case Studies for Combating Nuclear Terrorism*. (Santa Monica RAND 2005), pp. 26-27.

¹⁶ Thom Shanker, “U.S. Analysts Find No Sign bin Laden Had Nuclear Arms,” February 21 2002, p.1. CNN.com., “Was al Qaeda Working on a Super Bomb?” January 24, 2002. www.isis-online.org/publications/terrorism/transcript.html.

¹⁷ RAND *Aum*, p. 45.

determination to acquire a nuclear weapon and the possibility that some such weapons are unaccounted for or at least not under Russian control are disconcerting, to say the least.

For a nation-state, smuggling is one pathway, if not the preferred one, to a nuclear bomb. Unlike terrorists, states have various legitimate options for engaging a supplier country including official diplomatic ties, open contacts with officials, scientists and so on. In the case of Iran, a cozy nuclear relationship with Russia, epitomized by, but not limited to, the construction of a 1,000 MW nuclear power plant at Busehr is a continuing source of proliferation concern. Some U.S. officials believe that Iran could leverage the relationship to expand contacts with Russia's nuclear entities and to acquire information and materials directly applicable to a nuclear weapons program. For Iran, the chances of pulling off a clandestine procurement effort for nuclear wares seem much higher than for an internationally proscribed group such as Al Qaeda.

Iran's nuclear intentions and capabilities are very much matters of conjecture. The new National Intelligence Estimate (NIE) on Iran is an awkward document, one subject to widely divergent interpretations, but providing a more benign assessment of Iran's nuclear capabilities than probably is warranted. It judges with moderate to high confidence that Iran does not now have a nuclear weapon or sufficient fissile material to make one. However, it won't rule out that it could have acquired a weapon or the necessary explosive ingredients from abroad. According to the estimate, Iran halted its nuclear weapons program in 2003, but just what activities are subsumed under the term "program" is unclear.¹⁸ For example, available intelligence might indicate that Iran suspended efforts to retrofit long-range rockets for nuclear warheads, but fail to detect continued clandestine procurement activities for fissile materials and other bomb components.

Moreover, the NIE judges that Iran's centrifuge enrichment program faces major technical challenges and probably won't yield enough highly enriched uranium (HEU) until 2010–2015 timeframe. This strengthens the case for diplomatic approaches to Iran (as opposed to tougher sanctions and military strikes). Yet what lethal nuclear items Iran may already possess cannot be inferred from the performance of its uranium conversion and enrichment facilities nor from the spotty intelligence that apparently shaped the NIE. Indeed, Iran's highly publicized nuclear energy program could serve as a convenient cover for a parallel small scale – but potentially dangerous – weapons-building effort that relies extensively on black market operations to obtain strategic nuclear wares.

Iran's black market dealings are shrouded in mystery, but its procurement networks for nuclear bomb ingredients have most likely focused

¹⁸"Key Judgments from a National Intelligence Estimate on Iran's Nuclear Activity," *New York Times*, December 4, 2007.

on the former Soviet Union.¹⁹ As a 2001 Department of Energy report noted, “Iran, among others, has tried to exploit Russia’s nuclear security problems by attempting to acquire fissile materials”²⁰ Iran reportedly maintains an active network of front companies and espionage agents inside Russia to facilitate its WMD procurement objectives. Furthermore, Iranian legal nuclear cooperation with Russia could mask and facilitate a variety of illegal transfers, and also give Iran plausibility regarding its motives and actions.

In addition, Iran, like other aspiring nuclear actors, may seek weapons components by means of smuggling chains that they either patronize or control. For instance, in mid-2007 British authorities reported disrupting an alleged plot by a British company to smuggle Russian-origin HEU to Iran by way of Sudan. According to an account in the London *Observer*, “A group of Britons was tracked as they obtained weapons-grade uranium from the black market in Russia. Investigators believe that it was intended for export to Sudan and on to Iran.” The investigators reportedly had evidence that the material was destined for Iran’s nuclear weapons program. The incident may represent a sample of a wider proliferation problem. As a British parliamentarian who monitors export control matters observed, “If one company is involved, how many others might be out there?”²¹

Russia, of course, has long been notorious for its leaky nuclear stockpiles. Whether or not Iran (or other sinister actors) has been able to exploit gaps in Russian nuclear security to procure the ingredients for a bomb is an open question. Russian officials share Western skepticism about Iran’s near-term ability to develop a nuclear weapon but some less publicized signals from Russia should be cause for concern. In a post 9/11 conversation reported by former CIA director George Tenet, then Russian president Vladimir Putin told Bush that he could not account for the security of nuclear materials during his predecessor’s administration.²² (The well-publicized problems of the Yeltsin era – a near-bankrupt economy, disarray within the nuclear complex, and a rising tide of criminality and corruption – certainly provided a window for consequential proliferation episodes.)

Then, at a press conference in June 2002, General Yury Baluyevsky, outgoing chief of the Russian general staff, made the startling announcement that “Iran does have nuclear weapons. Of course these are non-strategic nuclear weapons. I mean they are not ICBMs with a range of more than 5,500 kilometers.” Baluyevsky did not elaborate on how Iran acquired

¹⁹ As a signatory to the Nuclear Non-Proliferation Treaty, Iran would have every incentive to keep such dealings secret.

²⁰ Department of Energy *MPC&A Program: Strategic Plan*, Washington, July 2001, p. 2.

²¹ Mark Townsend, “MI-6 Probes UK Link to Nuclear Trade with Iran,” *The Observer*, June 10, 2007.

²² George Tenet, *In the Center of the Storm*, (New York: HarperCollins 2007), p. 272.

the weapons or the wherewithal to manufacture them.²³ In a later statement, the general maintained that Iran would not be able “to develop nuclear weapons either in the near or in the distant future,” but the context of the remarks indicated that he was referring to Iran’s indigenous enrichment program, which would explain the contradiction.²⁴ Baluyevsky’s assertion is not incompatible with the NIE’s judgment that Iran stopped its nuclear weapons program in 2003, conceivably having gotten much of what it wanted by then.

Of course, it is hard to distinguish fact from fiction (or disinformation) in deciphering commentary on proliferation issues. Yet given Russia’s history of leaky nuclear stockpiles, the warnings about Iran have the ring of plausibility. While Western experts debate the sophistication and spin speed of Tehran’s centrifuges, Iran already could have obtained a nuclear weapons capability of sorts through clandestine transfers from the former USSR. The NIE’s conclusions substantially weaken the case for war with Iran (and rightly so, in this writer’s opinion), however, possibly for the wrong reasons. Consider that even a small number of “non-strategic” or defensive nuclear warheads in Iran’s possession could be delivered with devastating effect to Western targets via Iran-linked terrorist groups such as Hezbollah or Hamas. There is no hard evidence of such a capability, but the signs are disturbing enough to warrant caution in dealing with Tehran. Indeed, Washington eventually may have to acknowledge that, as former chief of U.S. Central Command John Abizaid puts it, “there are ways of living with a nuclear-armed Iran,” however unpalatable the prospect.²⁵

To some, the threat of a nuclear Iran or (especially) a nuclear Al Qaeda may seem greatly overblown. Yet it cannot be dismissed entirely. Certainly, it’s conceivable that, in the 16 years since the Soviet collapse, given Iran’s multifaceted nuclear relationship with Russia, and the distressing economic circumstances that afflicted Russia’s nuclear complex in the 1990s, that Iran could have managed to acquire enough fissile material for at least one bomb. Moreover, despite official Russian assurances, it requires a leap of faith to believe that all tactical nuclear warheads and small atomic munitions are safely locked down and accounted for in Russia. Conditions for a black market in weapons and other nuclear assets, thus, could have materialized in the confused post Soviet years, even if adversaries’ ability to exploit this opportunity was problematic.

²³ Safa Haeri, “Iran Has Nuclear Bomb, Says Top Russian General,” Iran Press Service, June 6, 2002.

²⁴ Central Asia-Caucasus Institute, “Iran Has No Chance of Producing Nukes on its Own—Russian Chief of Staff,” *The Analyst*, April 15, 2004.

²⁵ Peter Baker, “Bush’s War Rhetoric Reveals the Anxiety that Iran Commands,” *Washington Post*, October 19, 2007, p. 5.

Encountering the Black Market: the Role of Intelligence²⁶

Current U.S. non-proliferation policy emphasizes drawing lines of defense against smuggling at nuclear facilities, key border crossings and megaports. These programs are important agents of threat-reduction, but they are by their nature containment-oriented and have long timeframes to completion. Indeed at this juncture, some 16 years into the post-Soviet era, there is some danger that these efforts may amount to locking the proverbial barn door after some of the horses have already escaped.

In the “post-leakage” environment envisaged here, good intelligence on the nuclear black market becomes a vital component of nuclear security strategy. Unfortunately, this is not now the case. Few U.S. government officials follow the topic of nuclear smuggling full-time and few resources are devoted to researching, compiling and analyzing information on smuggling events. As a result, the link between clandestine transfers of nuclear goods and the spread of nuclear weapons capability remains ill-defined, clouding assessments of adversaries’ capabilities and hampering threat-reduction efforts. The ambiguities of the recent NIE in Iran and the dearth of information on Al Qaeda’s nuclear activities can be considered examples of this failing.

A central role of the intelligence community in nuclear security policy is to clarify this link. While broad assumptions have been made about the nuclear intentions of certain states and non-state actors, their precise targets and plans remain unclear. Intelligence, coupled with proactive law enforcement (such as undercover sting operations) can assist in preemption—detecting and disrupting clandestine supply chains for nuclear wares. Not enough is known about these activities, to the extent that they exist, for example, how procurement activities are organized and financed, what front companies, criminal groups and other intermediaries are used, and who their inside collaborators are. In confronting the black market, intelligence can be assembled as a dynamic component of nuclear defense, complementing the essentially reactive and stationary materials management systems that the United States is introducing in Russia and elsewhere.

A further task is damage assessment and control. Where nuclear leakage already has occurred, intelligence can determine where the theft originated, where the material is headed, and who the likely customers are. Importantly, intelligence also can aid in the recovery of dangerous items that have been removed from state-controlled systems but that have not yet fallen into the hands of our adversaries. Often, nuclear materials are pushed into smuggling channels before a buyer connection is definitively established. For instance, the HEU seizures in Georgia could have been part of a larger cache purloined and secreted in the Yeltsin years, awaiting such a connection. Offers

²⁶ See also discussion in Rensselaer Lee, “Nuclear Smuggling: Patterns and Responses,” *Parameters*, Spring 2003, pp.106-107.

of amnesty or even rewards for information on nuclear theft episodes along with well-designed sting operations could facilitate damage control and recovery efforts.

Finally, an intelligent threat-reduction policy will require improved collaboration with host country security and intelligence organizations, especially those in former Soviet states. Formal and informal mechanisms of information-sharing on smuggling incidents, actors, trends and threats would be of great value in configuring non-proliferation programs in Russia and other newly independent states. As the Center for Non-Proliferation Studies' William Potter explains, "Meaningful intelligence sharing is crucial in filling in gaps in past trafficking cases" and "is particularly vital in the context of the war against international terrorism."²⁷ Granted, U.S. liaison partners have different interests than the United States, as well as different perceptions of the nuclear proliferation threat, (witness the contrasting U.S.-Russian positions on Iran); hence, maintaining and expanding a unilateral U.S. capability to monitor trends in the nuclear black market may be of central importance.

Conclusion

Nuclear smuggling in its global ramifications represents a recurrent and dangerous threat to international security and stability. The intelligence estimation process needs to take into account the vast potential of the black market for supplying adversaries with nuclear-related and other WMD items. Within Russia, where the threat of "loose nukes" has been a paramount U.S. concern, the window for consequential theft and smuggling events appears to be closing, but the difficult legacy of the Yeltsin years will continue to haunt U.S. non-proliferation efforts there. Perhaps a careful retrospective analysis of the smuggling cases of the period can shed light on what proliferation damage might have occurred and what challenges we could face as a result.



²⁷ William Potter and Elena Sokova, "Illicit Trafficking in the NIS: What's New? What's True?" *Nonproliferation Review*, Summer 2002, p. 119.