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Feature Article

U.S. Fears Proliferation of 'Orphan' Nukes

Experts say current military spending priorities fail to address nuclear threat

by John Stanton

The United States today finds itself at greater risk of a radiological attack than at the height of the Cold War, according to government officials and independent experts. Concerns that had emerged way before the

September 11 attacks have been exacerbated in recent months, as U.S. officials worry that terrorist groups may have access to radioactive materials that could be used to fabricate crude radiological dispersion devices and rudimentary nuclear bombs.



But that is not the only reason for U.S. officials to fret. Of more significant concern is the wide availability of “orphaned” hardware and nuclear waste that conceivably could help a motivated terrorist or domestic separatist put together a weapon deadly enough to kill thousands of people. Orphaned is a term used within the nuclear industry to describe equipment and fissile materials that have been lost or stolen and are not inventoried anywhere. The former Soviet republics are the most notable source of orphaned nukes.

An average of approximately 375 sources or devices of all kinds are reported lost or stolen each year in this nation—which amounts to about one per day.

Richard Meserve, chairman of the Nuclear Regulatory Commission, indicated that there are 103 licensed civilian nuclear reactors in the United States. By contrast, there are roughly 150,000 licensees for radioactive materials and 2 million devices containing radioactive material.

In October, two portable moisture-density gauges, containing sealed sources of radioactive material, were reported wrested off the back of a pickup truck at a work-site in Philadelphia.

Those gauges have not yet been found, said Neil Sheehan a spokesman for the Nuclear Regulatory Commission. They have now become orphans.

“Orphans tend to find parents real fast,” said Michael Levi, of the Nuclear Project, at the Federation of American Scientists, in Washington, D.C. Indeed, he said, there is a lucrative international market for nuclear equipment and radioactive material. Between 1993 and 2001, the International Atomic Energy Agency, in Vienna, recorded 550 instances of trafficking of which about half involved radioactive sources. IAEA said that the growth could be attributed to the increased trafficking of highly enriched

uranium. For example, in April 2000, almost one kilogram of highly enriched uranium was seized from smugglers.

Levi said that U.S. officials need to anticipate how a terrorist may carry out a radiological attack. “We tend to associate terrorists with things that blow up,” he said. “The prevailing view is that a radiological dispersion device (RDD) or nuclear bomb will be the preferred method of delivery, but it’s equally as likely that terrorists will buy radioactive waste and manually disperse it in terminals, subways or other crowded places.” Of immeasurable consequence, he added, is the psychological damage that the explosion of an RDD or the detonation of a low-yield nuclear weapon would inflict on the population.

The destructive powers of a successful detonation of a low-yield nuclear device or an RDD would far surpass the death toll of the September 11 terrorist attacks. The International Physicians for the Prevention of Nuclear War in Cambridge, Mass., estimated that an explosive nuclear device, with a 12-kiloton yield, surface-detonated in downtown New York City during peak business hours, would result in 60,065 immediate fatalities, with another 60,065 non-fatally injured.

The International Physicians for the Prevention of Nuclear War used a computer model known as COSYMA to simulate an explosion in London of 35 kilograms of plutonium wrapped in conventional explosives. COSYMA—Code System from Maria—is used for assessing the off-site radiological and ecological consequences of accidental atmospheric releases of radioactive material.

While the initial blast would cause minimal fatalities, the deadly cloud of plutonium would lead to 2,000 to 10,000 deaths from fibrosis and collapsing of the lungs and, ultimately, cancer.

“Given the public aversion to cancer risk and fears engendered by the reputation of plutonium as a potent carcinogen, there are likely to be ... evacuation and relocation plans, as well as the imposition of food bans,” said a recent study by the International Physicians for the Prevention of Nuclear War. “In a city the size and density of London, 300,000 to 1.5 million people would need to be evacuated for 30 days or more from an area of 900-5,000 square-km in an arc about 100+ km from the release.

“Longer periods of evacuation and relocation might well be required until the land was sufficiently decontaminated,” said the study.

On the question of whether in fact an RDD or a nuclear device can be built relatively easily, opinions diverge. According to data from IAEA’s Illicit Trafficking Database and the U.S. Nuclear Regulatory Commission, radioactive material could find its way into the wrong hands.

“The Russians believe very strongly that a sophisticated sub-state group, with 30-50 people using off-the-shelf equipment, could actually create the bomb-grade materials from low-grade uranium and make several bombs a year,” said Bruce Blair, president of the Center for Defense Information, in Washington, D.C. “Centrifuges critical to the process, for example, are available from medical supply companies,” he said.

It’s no secret that there are many capable physicists around the world who could build rudimentary nuclear weapons. For years, physicists on track to be employed by U.S. nuclear weapons labs bide their time by engaging in “Nth Country Experiments” while their security clearances are being processed. “The labs routinely conduct break-in assignments like ‘Nth Country’ where

they have the new employees do their best to design a nuclear weapon on the cheap,” said Blair. “The labs like it, because sometimes the results are new and innovative.”

Overlooked in the discussion of emerging nuclear threats to the United States are tactical weapons, said Allistair Millar, vice president and director of the Fourth Freedom Forum, in Washington, D.C., a research organization that explores the use of economic incentives and sanctions to advance nuclear nonproliferation and resolve international conflicts.

“Tactical nuclear weapons pose unique dangers as weapons of terror,” he said. “Their often-smaller size increases their portability and vulnerability to theft by non-nuclear states and potential nuclear terrorists.”

The command-and-control features of tactical nuclear weapons are of most concern, he said. They come with “pre-delegated launch authorization, and often inadequate safeguards such as ineffective permissive action links, [which] add to their potential unauthorized, accidental or illicit use.

“We don’t have a system for accounting for tactical nuclear weapons, which are not monitored or controlled by any existing treaties or formal agreements,” said Millar.

Millar recently co-authored a report titled “Uncovered Nukes: A fact sheet on tactical nuclear weapons.” In it, he noted that the tactical nuclear weapons arsenal of the United States is estimated at 1,670 warheads. These are stored mainly at facilities in the U.S. mainland. About 150-200 are deployed across eight bases in Europe.

Estimating the Russian arsenal is more complicated. There are conflicting accounts and serious doubts about whether the Russians even know how many tactical nuclear weapons they have. The most recent estimate of the Russian arsenal is about 3,590 deployed weapons. When warheads stored or slated for dismantlement are taken into account, these estimates grow to as high as 15,000.

“This is a very serious problem, particularly as it relates to Russia,” said Millar. There is no real evidence that demilitarization of tactical nukes has taken place, because the Russian 12th Main Directorate of the Ministry of Defense—responsible for nuclear munitions deployment, testing, security—and Miniatom—which oversees deactivation of nuclear weapons and stockpiles of plutonium—don’t talk to each other and keep poor records, he said.

Blair noted that Russia is a “nuclear wasteland” of decaying weaponry and unguarded radioactive matter. “Grandmothers with pitchforks are guarding the radioactive dumps, the nuclear installations,” he said. “The Russian attitude is that these items do not deserve a great deal of security and that there are more pressing issues to deal with.”

The best option for the United States, Blair said, is to “reduce our exposure to these threats, thwart some of them, because we will never be able to stop them all”.

Consequence Management

As part of its evolving homeland defense mission, the Pentagon will be one of the agencies involved in consequence management of a nuclear or radiological attack on the civilian population, said Army Capt. Robert Bennett, spokesman for the Defense Threat Reduction Agency.

“How do we talk to America about these types of problems?” Bennett asked rhetorically. “Our Consequence Management Advisory Team has been looking at ways to improve how we support the civilian sector’s response to the detonation of an RDD or other nuclear device,” he said. “We’ve held human behavior workshops and have done modeling and simulation to determine blast impact and radioactive fallout. And we’ve learned a heck of a lot from the response to September 11.”

One of DTRA’s contributions is the Hazard Prediction Assessment Capability, a computer simulation that can help predict the path of a radioactive cloud. “Time-delayed affects come into play here, and this particular program considers weather conditions along with the radiological factors,” Bennett said. “It can show you what will happen in 20 minutes, then 40 minutes and so on. We provide this to first responders when they ask for it.” This simulation also was configured to track asbestos particles released from the ruins of the World Trade Center.

DTRA has held several radiological response exercises during the past year. One was Olympic Response II in Salt Lake City, in the spring of 2001. The scenario involved the dispersion of a deadly radioactive waste cloud that had been detonated using conventional explosives. DTRA assisted the Salt Lake City Olympic Committee in understanding “the dangers and how best to deal with them,” Bennett said.

He pointed out that when DTRA participates in any homeland defense activity, the agency reports to the local mayor or the state governor.

The real gumshoes in this business, meanwhile, are the members of the Nuclear Emergency Search Team (NEST). Since 1975, NEST has investigated 110 terrorist nuclear threats and developed responses to approximately 30 of them. NEST draws talent from the nation’s nuclear weapons labs and volunteers from the Department of Energy. According to a study by the Brookings Institution, NEST maintains a massive database that “contains everything publicly available about making a nuclear weapon.” Some team members even design and disarm homemade nuclear weapons using commercial off-the-shelf components.

If there is in fact a growing domestic nuclear threat, the Defense Department is ill equipped to tackle it, Blair said. The current defense budget priorities do not reflect homeland-security requirements, he explained. “There’s tremendous misallocation. Security and protection of the U.S. mainland has been under-funded and not thought through. We are willing to spend \$200 million for an F-22, but we are not willing to put that dollar amount into smallpox vaccines or other programs to defend our own people.”

Like Blair, Millar also questioned the spending priorities of the Defense Department.

“We have got to get [the tactical nuclear threat] out of the Cold War context,” he said. “It costs something on the order of \$40,000 per hour to fly a B-2 from the U.S. to, say, Afghanistan or Kosovo. “Has anyone thought about taking that money and converting six unemployed Russian nuclear weapons scientists, who would sell anything to put food on the table, to help us out and do good things?”

Arms control experts, such as Blair and Millar, said they would recommend that the Bush administration pursue new international weapons treaties that go beyond the reduction of strategic nuclear missiles and focus on tactical weapons. Programs such as the Nunn-Lugar—designed to dismantle Soviet

nuclear missiles and to keep Russian scientists employed—should be fully funded, they said.

International initiatives to monitor illicit trafficking through the International Atomic Energy Agency also need more financial backing from the United States, Blair said. U.S. government regulators, such as the Nuclear Regulatory Commission, must be more aggressive in monitoring the private sector's use, transport and disposal of radioactive materials.

Responding to a reporter's question about whether al Qaeda leaders may have acquired fissionable materials to make a nuclear bomb, Defense Secretary Donald Rumsfeld said, "There is intelligence information floating around the world in various countries ... that reflects the fact that the al Qaeda organization has an interest in weapons of mass destruction—chemical, biological, radiation, as well as nuclear."