

# Cleaning House

## *Dirty Bombs and the Nuclear Non-Proliferation Treaty*

**O**n June 10, 2002, US Attorney General John Ashcroft announced the arrest of Abdullah al Muhajir, a US citizen who allegedly was planning a radiological weapon, or “dirty bomb,” attack against the United States in collaboration with Al Qaeda. This announcement aroused fear in many US citizens, who were confronted with the possibility of a post-September 11 onslaught of terrorist activities. Coincidentally, Ashcroft’s statement

came in the midst of the Geneva-based Conference on Disarmament (CD), which was convened to address ongoing threats of nuclear proliferation, including proliferation by non-state actors. The announcement of the arrest initiated a new debate in the CD on how to control the development and deployment of radiological weapons. A starting point for the CD discussions is the Nuclear Non-Proliferation Treaty (NPT), which prohibits the development of the radioactive materials used in radiological weapons. However, the NPT has proven insufficient in regulating fissile material and is not an adequate framework for preventing the acquisition and use of a radiological weapon because it lacks the specific technical and political provisions necessary to prevent the development of such weapons.

### *A Dirty History*

There are several important differences between a strategic nuclear weapon and what has become known as a “dirty bomb.” A “dirty bomb,” or radiological weapon, does not have to be assembled from fissile-grade mate-

rial (plutonium or uranium) and does not require activation energy in order for fission to occur. A radiological weapon also requires only radioactive decay rather than a complete fission reaction. Dispersed by conventional explosive devices, such as dynamite, detonation of a radiological dispersal device (RDD) would not be accompanied by the large amounts of heat and energy associated with a nuclear explosion.

Anthony Cordesman of the Center for Strategic and International Studies identifies radioactive elements used in hospitals, nuclear power fuel rods, and scientific research laboratories, and weapons grade fissile material as potential components of dirty bombs. Once the RDD is detonated, the radioisotopes decay, contaminating the environment with radioactive fallout. The long-term effects of a radiological weapon result from the fallout itself. Chronic exposure to the resulting atomic radiation causes tissue damage and cancer. There is also speculation that the fallout would contaminate water and food sources in nearby areas. The short-term effects

are not as well known, but ingestion or inhalation of radioactive material is known to cause radiation sickness, accompanied by tissue damage and other complications.

Even though there are many potential sources of radioactive material, there is no recorded instance of a radiological device being used as a weapon. However, there are many cases similar to the arrest of al Muhajir in which a plot to use a radiological weapon has been foiled. In the mid-1990s, Chechen rebels placed cesium in a Moscow park. Luckily, Russian security forces seized the materials before the weapon was detonated.

There have also been several incidents involving the accidental dispersal of radioactive material. In 1997, soldiers on border patrol in Georgia came across abandoned cesium-137 and cobalt-60 isotopes and became ill with radiation-induced skin disease. The most severe accident occurred in 1987 in Goiânia, Brazil. Scavengers happened upon an abandoned cancer clinic and dismantled a metal capsule containing cesium-137, exposing hundreds of people to the radioactive material.

Leah Litman, Senior Editor, *Harvard International Review*

The Brazilian Nuclear Energy Commission diagnosed over 240 people, four of whom later died, with some form of radiation sickness. Although the international community has been confronted with situations involving the near or accidental release of radioactive materials, there were no such incidents in the United States until the arrest of al Muhajir, which renewed the focus on radiological weapons.

### *Beyond the NPT*

The NPT was the result of a concerted global recognition of nuclear power's potential dangers. In 1965, after France detonated a nuclear weapon in Algeria, the United Nations passed Resolution 2288, which provided the framework for the NPT. After rounds of negotiations between the Soviet Union, United States, and United Kingdom, the United Nations approved the final version in 1968. The current version of the NPT prohibits

the acquisition of nuclear weapons and contains provisions designed to limit their political role. The NPT includes no-first-use pledges and specific bans on the use of nuclear weapons against non-nuclear states. Violators of the NPT are subject to economic sanctions.

After the initial frenzy surrounding the arrest of al Muhajir and the investigation of his potential ties with Al Qaeda, members of the international community sought a strategy for preventing the use of radiological weapons. The NPT provided a logical but flawed beginning. Despite the NPT's role in regulating radioactive materials, its more prominent function is to serve as a cohesive international caucus, capable of encouraging states to minimize their reliance on nuclear weapons. The NPT therefore represents one attempt to resist the spread of nuclear materials and reduce the likelihood that they will be used in ra-

diological weapons.

While the NPT has the potential to contribute to the control of radiological weapons, it does not supply an effective legal framework to combat radiological attacks because it lacks specific provisions for radiological weapons. Additionally, the NPT has not even been entirely effective in halting the spread of nuclear material, its primary objective and greatest contribution in the fight against dirty bombs. The only materials that the NPT restricts are enriched uranium (U-238) and weapons-grade plutonium (Pu-239). It does not address the many other radioisotopes that can be incorporated into dirty bombs. Of the 175 cases of nuclear materials trafficking reported by the International Atomic Energy Agency (IAEA) between 1993 and 2001, only 17 involved U-238 or Pu-239. In addition to IAEA documented cases, experts estimate that there were over 200 additional undocu-

**Beijing residents pose for pictures at the Chinese Military Museum in front of one of China's first nuclear missiles, the Dong Feng I.**



Photo Courtesy AFP Photo/S. Shaver

mented instances of radioactive material trafficking during the same time.

Definitional similarities between radiological and nuclear weapons also present difficulties for using the NPT to regulate radiological weapons. States with strategic nuclear armaments are concerned that broad definitions of ra-

tions about its role in curtailing the development of dirty bombs. Many of the former Soviet republics—including Belarus, Georgia, Latvia, Ukraine, Uzbekistan, and Kazakhstan—possess weapons grade material. Furthermore, the United States and Russia have identified over 95 weapons grade material

velop radiological weapons than they are to develop strategic nuclear weapons. The express purpose of the NPT is to curb proliferation among states, and while there is some threat from state-sponsored or state-created radiological weapons, El Baradei noted that a more insidious threat comes from ter-

**While there is some threat from state-sponsored or state-created radiological weapons, [IAEA Director General] El Baradei noted that a more insidious threat comes from terrorists.**

diological weapons could include nuclear weapons. Therefore, limitations and regulations on the use of radiological weapons could be applied to nuclear weapons as well. Using the NPT as a framework for radiological weapons would do nothing to allay these fears. Instead, states would be less motivated to seek thorough limitations on radiological weapons if they felt that doing so would mean compromising their strategic nuclear capabilities.

Other NPT loopholes allow for supply-side proliferation, namely the sale of radioactive materials to other states for defense purposes. This is the justification Russia uses in its current arms sales to Iran, in particular the recent agreement, totaling US\$7 billion in defense transactions toward the establishment of a “defensive” missile system. Russian President Vladimir Putin defended the sale in an *Iran Times* article by stating, “Iran has a right to defend itself.” Russia has also sold Iran laser enrichment technology for the alleged purpose of nuclear power experimentation. This enrichment technology has the potential to convert non-radioactive elements into radioactive material that could be used in dirty bombs.

The NPT’s inability to control fissile material also raises serious ques-

storage sites with insufficient security. Reduced funding for the Cooperative Threat Reduction program (CTR), an initiative that directed funds toward improving nuclear security in Russia and the former Soviet republics, has minimized the effectiveness of such programs. Additionally, the CTR does not provide for the regulation of lower level nuclear sources and non-weapons grade material. Russia has also announced plans to dismantle nuclear submarines in addition to the strategic reductions negotiated in the Bush-Putin agreement. The NPT does not have the capacity to regulate additional nuclear material that will be stored in already overburdened facilities.

Verification of other radiological sources would be even more difficult than the verification employed for regulating nuclear material and devices. The trafficking of radioactive materials can easily go undetected if the carrier is willing to risk his own health. Unfortunately, IAEA Director General Mohamed El Baradei stated that for the individuals who are trying to obtain radioactive material, “The danger of handling powerful radioactive sources can no longer be seen as an effective deterrent, which dramatically changes previous assumptions.” Non-state actors also are more likely to de-

rorists. The treaty does not provide disincentives or monitoring capabilities for individuals or groups to acquire or develop radiological material.

*Alternative Strategies*

Some fissile material regulation efforts outside of the NPT have been successful. The IAEA is conducting programs similar to the CTR in conjunction with the US Department of Energy and the Russian Federation’s Ministry for Atomic Energy (MINATOM) in order to secure radioactive sources that the CTR does not explicitly regulate or does not have the capacity to protect. The IAEA also has experimented with techniques to recover radioactive sources and has trained border guards and other officials to detect illicit transportation of radiological materials. Such practices are successful in detecting individuals and groups involved in radiological terrorism. IAEA missions have been successful in securing abandoned medical radioactive material in Afghanistan and abandoned strontium sources in Georgia. Unfortunately, the NPT has not yet expanded its monitoring techniques at a more localized level, as evidenced by its inability to monitor the radioactive material in Afghanistan and Georgia.

Activities in the international arena have also diminished the effectiveness of the NPT as it attempts to regulate nuclear materials. The NPT provides for numerous nuclear arms control efforts as part of the general process toward disarmament including comprehensive nuclear test bans and no-first-use pledges. The United States has not yet ratified the Comprehensive Test Ban Treaty (CTBT), and the only nuclear weapon state that has a no-first-use pledge is China. The release of the US Nuclear Posture Review (NPR) has also detracted from the credibility of the NPT. According to Jayantha Dhanapala, the UN Under-Secretary-General for Disarmament Affairs, the NPR's endorsement of the use of lower yield nuclear weapons to be used to destroy chemical or biological weapon stockpiles only "reinforces the role of nuclear weapons," rather than minimizing it. Additionally, the NPR retains an ambiguous stance about negative security assurances, which are the promises of nuclear weapons states not to conduct nuclear strikes on non-nuclear weapons states. Dhanapala further states that the absence of negative security assurances creates the incentive to proliferate because non-nuclear weapons states feel they must have the ability to retaliate with nuclear capabilities. This directly undermines the ability of the NPT to generate a consensus against procuring materials that could be used in developing radiological weapons.

Although the NPT has the potential to curb the procurement of fissile material and proliferation, it is not wholly effective in this realm because the lack of verification hampers its efforts to control the demand and supply aspects of proliferation. NPT signatories also have not solidified the international standard against fissile material that was one of the treaty's goals. The NPT lacks provisions for control-

ling and securing other types of radioactive materials that could be used in radiological weapons and does not provide for a framework of negotiations with India or Pakistan. If the international community truly wishes to clean up dirty bombs, much needs to be done beyond the NPT.

The status quo reliance on the NPT has to be shifted toward exploring other options for controlling radiological weapons. The IAEA has already embarked on several projects that include securing radiological sources not protected by the NPT, which could allow for the development of a policy or treaty tailored specifically to the threat posed by radiological

weapons. The IAEA also has the technical expertise to deal effectively with the variety of radiological sources. Political complications that the NPT encounters do not hamper the IAEA's undertakings, even when it has worked in conjunction with national organizations such as the US Department of Energy or Russia's MINATOM. Ultimately, the proliferation of dirty bombs cannot be curtailed so long as the international community relies on outdated and ineffective measures such as the NPT. The threat of radiological weapons warrants a broad, multilateral consensus, unified in the search for measures capable of sweeping away dirty bombs. ■

**A scientist inspects a mixed oxide pellet, one of the many potential components of "dirty bombs."**

