

Truck Carrying Radioactive Material Stolen in Mexico

The recent theft in Mexico of a truck carrying a potent radiological source (Cobalt-60) has attracted high-profile attention, including from the International Atomic Energy Agency and the United States government. Although it appears to have been resolved with no public threat materializing, the incident has raised several questions regarding the security of radiological and nuclear (RN) materials in the Latin American region.

In light of these events, START's Unconventional Weapons and Technology Research Program compiled information to provide context in regards to the potential nexus between terrorism, transnational crime organizations (TCO) and RN weapons, the potential for radiological terrorism, and previous RN threat and smuggling incidents in Mexico and Latin America.

POTENTIAL NEXUS BETWEEN TERRORISM, TRANSNATIONAL CRIME ORGANIZATIONS, AND RN WEAPONS

Although unfounded, the recent incident in Mexico stirred concern regarding the potential for criminal organizations to acquire, smuggle, and sell radiological materials, possibly to terrorist organizations. While there are many potential intersections between TCOs and terrorists, ranging from hybrid organizations to ideologically- or kinship-based collaboration, the scenario that seems to be of most concern to policymakers is TCOs utilizing their existing pathways and infrastructures for smuggling drugs, human beings and other cargo into the United States in order to provide a "delivery service" for terrorists to smuggle RN weapons or materials into the United States.

It is immediately apparent that TCOs in the Latin American region will have substantial disincentives to collaborate with terrorists, especially when it comes to RN materials. There are many reasons for this, including:

- the profit-seeking motivations of most TCOs;
- the risks involved in terms of both safety to TCO members and potential retribution from authorities; and
- a desire on the part of TCOs not to disrupt the market for their goods (the U.S. public).

Similarly, many terrorists would hesitate to entrust RN materials, which are often hard to acquire and work with, to TCOs with vastly differing worldviews and who might expose the terrorists to additional risk of detection.

Nonetheless, there are circumstances under which such collaboration might occur. A terrorist group might simply not have the means of moving RN materials into the United States on their own and would thus be forced to outsource the task to other illicit entities. In this scenario, terrorists might opt to insert RN materials surreptitiously into TCO smuggling networks by disguising this as other goods or by co-opting lower-level TCO members as freelancers. There are also certain, albeit unlikely, shifts that could occur within a TCO that might make it more amenable to the risks involved with smuggling RN materials. These could include if a TCO is in rapid decline and has little to lose, if it has ethnic or kinship ties with a terrorist organization, or if a TCO begins to develop a political ideology that becomes antithetical to the United States. There are isolated cases of all of these happening at various times and places around the world, however, the vast majority of TCOs and many terrorist groups will have little to gain from this type of collaboration and the disincentives for TCOs to become involved in RN smuggling will predominate. The feared nexus will therefore most likely occur in only the rarest of circumstances and any response efforts should be weighed against a range of other, often more pressing, threats.

COBALT-60 AND THE POTENTIAL FOR RADIOLOGICAL TERRORISM



The International Atomic Energy Agency (IAEA) classifies cobalt-60 (Co-60) as a category 1 radioactive source that "if not safely managed or securely protected, would be likely to cause permanent injury to a person who handled it or who was otherwise in contact with it for more than a few minutes." Co-60 has a half-life of 5.27 years and is used in a variety of industrial and medical applications, including teletherapy, sterilization, and food irradiation. Co-60 decays to nickel-60 while emitting beta and high-energy gamma radiation. While small sheets of aluminum or even foil can block most beta radiation, the blockage of gamma radiation requires significant amounts of aluminum or concrete. The material's emission of high-energy gamma rays and its comparatively widespread availability have long made Co-60 a radioisotope of particular concern to homeland security officials.

Mexican authorities have informed the IAEA that the Co-60 source was in transport to a radioactive waste storage center, which likely refers to the low-level radioactive collection, treatment and storage center Mexico operates at Maquixco, located north-

east of Mexico City. This suggests that the source in question was in the process of being retired after several years of usage in a hospital, and therefore radioactive decay would have reduced the activity of the source to a point where it was no longer usable in medical applications. Consequently, the source's usefulness as a radioactive material for use in a radiological dispersal device (RDD) or the threat it poses to public health would be exponentially smaller compared to its original composition.

That said, it is important to keep in mind that the detonation of a RDD, or "dirty bomb," would likely constitute an event of *mass disruption* rather than *mass destruction*. The immediate casualties resulting from such an attack would be caused by the conventional explosives used by an adversary to disperse the radioactive material, not by exposure to the material itself. However, individuals present at the site of the attack could experience short- and long-term health effects depending on their proximity to the material and the duration of exposure.

At a minimum, a radiological attack would entail considerable costs for cleaning up the attack site and may lead to at least the temporary displacement of people residing in the area where the attack occurred. The disruptive psychological impact on a public largely unaware about the effects of radiological terrorism would likely be far more damaging than the actual physical destruction, and could result in billions of dollars in economic damage and could stress the public health system.

While its natural decay has likely substantially reduced its potency, the Co-60 source still poses a serious public health hazard to anyone who has direct exposure without proper protection.

RN THEFT AND SMUGGLING INCIDENTS IN MEXICO AND LATIN AMERICA

While incidents explicitly regarding the theft and/or smuggling of RN materials in Mexico could not be identified prior to this current incident, it should be noted that Mexico has faced difficulties in controlling "orphaned" radioactive sources in recent years.¹ Some reports suggest that the nation does not have adequate mechanisms used to track sources, particularly smaller sources, originally used in medicine and industry. A considerable number of sources enter the country illegally due to high importation and licensing costs.² In the past decade alone, three to four orphaned sources disappeared and have yet to be recovered in Mexico.³ In addition to issues tracking materials, experts have identified the disposal and transport of radioactive sources and waste to be a particular vulnerability.⁴ Regionally, there have been a number of significant discoveries of orphaned sources or interdiction of stolen RN materials in Latin America, primarily in Colombia and Venezuela. A few of these incidents are detailed below.



¹ Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. In global security newswire. *Nuclear Threat Initiative*. Retrieved from, <http://www.nti.org/analysis/articles/mexico-lacks-control-radioactive-sources-faces-problem-orphan-sources/>

² Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. <http://www.ipsnews.net/2011/05/mexico-little-oversight-of-radiation-sources/>.

³ Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. In global security newswire. *Nuclear Threat Initiative*. Retrieved from, <http://www.nti.org/analysis/articles/mexico-lacks-control-radioactive-sources-faces-problem-orphan-sources/>;

Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. Retrieved from, <http://www.ipsnews.net/2011/05/mexico-little-oversight-of-radiation-sources/>.

⁴ Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. In global security newswire. *Nuclear Threat Initiative*. Retrieved from, <http://www.nti.org/analysis/articles/mexico-lacks-control-radioactive-sources-faces-problem-orphan-sources/>.

MEXICO

- In 2011 a “sealed unit of cobalt-60” from a decommissioned Picker 3000 radiotherapy machine was discovered in Ciudad Juarez, a city directly adjacent to the United States border.⁵ The material from this incident was not identified in Mexico’s National Commission on Nuclear Safety and Safeguards’ (CNSNS) records and the origin of this source remains unknown.⁶
- In 1983, a radiotherapy machine that had been originally smuggled into Mexico from the United States years earlier and contained approximately 6,000 1-millimeter pellets of cobalt-60 (about 400 curies) was sold by hospital employees to a scrap yard in Ciudad Juarez. Here, the pellets were scattered throughout the yard and processed into an estimated 6,608 tons of contaminated reinforcing rods which were then distributed throughout the country.⁷ The contaminated reinforcing rods were only detected when a truck took a wrong turn towards the Los Alamos Scientific Laboratory in New Mexico where it activated their radiation detection equipment. The same day, five other trucks were stopped at the El Paso border crossing in Texas.⁸ Lister estimates that between 500 and 931 tons of the contaminated metal had been shipped into the United States⁹. In 1985, authorities determined that 17, 636 buildings contained contaminated reinforcing rods,¹⁰ and at least 10 individuals had significant exposure resulting in one death and four injuries.¹¹

COLOMBIA

- Two incidents similar to the current situation occurred in 1998. The first situation transpired in February of that year when a tractor trailer transporting Americium-241/beryllium neutron source and a Cesium-137 gamma ray source was attacked by criminals while en route to Orinito from Bogotá.¹² The criminals threatened to release the materials at the Shlumberger Surencó S.A. facilities (the rightful owners of the materials) in Huila, Casanare, and Putamayo. Ultimately, the criminals were arrested and the materials were recovered. This was the first incident in which radioactive materials had been stolen for criminal purposes.¹³ It can be assumed that, because the materials were being shipped in tractor trailers, these were relatively large sources that would be quite harmful if shielding had been removed. Not only is this incident significant because of resemblance to the current situation, but also because of the use of extortion as well as the size and type of the sources.
- The second incident occurred about five months later when police reported the theft of a truck carrying Iridium-192 which was shielded by a lead and steel container which weighed 24 kilograms. The original driver, an expert in handling RN materials, had been found drugged in the outskirts of Bogotá. This incident was of particular concern because the material was 30 curies and could pose a significant danger to the thieves as well as others if mishandled.¹⁴ It is unknown whether organized crime was involved.
- In 2006, the Colombian military seized depleted uranium from a man and woman in Bogotá, Colombia.¹⁵ The individuals attempted to sell the radioactive materials to an undercover police agent for 315 million dollars.¹⁶ The value for which they intended to sell the materials suggests they had little to no understanding of RN materials as depleted uranium has no value or use for RN weaponry.

⁵ Godoy, E. (2011, April 18). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. Retrieved from, <http://www.ipsnews.net/2011/04/mexico-recurring-risks-from-radioactive-materials/>.

⁶ Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. Retrieved from, <http://www.ipsnews.net/2011/05/mexico-little-oversight-of-radiation-sources/>.

⁷ Johnston, W.R. (2005, November 23). *Ciudad Juarez orphaned source dispersal, 1983*. Retrieved from, <http://www.johnstonsarchive.net/nuclear/radevents/1983MEX1.html>; Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. Retrieved from, <http://www.ipsnews.net/2011/05/mexico-little-oversight-of-radiation-sources/>.

⁸ Johnston, W.R. (2005, November 23). *Ciudad Juarez orphaned source dispersal, 1983*. Retrieved from, <http://www.johnstonsarchive.net/nuclear/radevents/1983MEX1.html>.

⁹ Lister, B.A.J. (1985 September). Contaminated Mexican steel incident. *Journal of the Society for Radiological Protection*. Retrieved from, http://iopscience.iop.org/0260-2814/5/3/407/pdf/0260-2814_5_3_407.pdf.

¹⁰ Godoy, E. (2011, May 13). Mexico: Little Oversight of Radiation Sources. *Inter Press Service*. Retrieved from, <http://www.ipsnews.net/2011/05/mexico-little-oversight-of-radiation-sources/>.

¹¹ Johnston, W.R. (2005, November 23). *Ciudad Juarez orphaned source dispersal, 1983*. Retrieved from, <http://www.johnstonsarchive.net/nuclear/radevents/1983MEX1.html>.

¹² Interdict/RADACAD.(2008, May). *Pacific Northwest National Laboratory*. Retrieved from, <http://interdict.pnnl.gov/>.

¹³ Garcés, A.P. (1998, June 20). DAS quashes criminal plan to leak radioactive material. *El Tiempo* (Bogotá); DAS recover stolen radioactive shipment. (1998, June 19). *Intravision* (Television channel).

¹⁴ Burglars steal container filled with radioactive materials. (1998, July 18). *Agence France Presse*.

¹⁵ DPA. (2006, March 2). Colombia Seizes 13.5 kilograms of uranium, possible soviet origin. *Americas News*. Retrieved from, <http://denuclear.blogspot.com/2006/03/colombia-seizes-135-kilograms-of.html>.

¹⁶ DPA. (2006, March 2). Colombia Seizes 13.5 kilograms of uranium, possible soviet origin. *Americas News*. Retrieved from, <http://denuclear.blogspot.com/2006/03/colombia-seizes-135-kilograms-of.html>.

- In 2008, 30 kilograms (66 pounds) of depleted uranium were recovered by Colombian authorities in roadside underbrush in a town south of Bogotá that was considered to be a Marxist guerilla stronghold.¹⁷ The authorities were led to the buried cache containing two pieces of uranium by informants linked to an arms dealer who had been mentioned in files discovered on the computer of slain FARC leader Raul Reyes.¹⁸ While depleted uranium is not dangerous in terms of its usability for an RN weapon, this incident as well as Reyes' computer files did provide some indication that there may have been a desire and motivation for regional actors to traffic RN materials for profit.
- More recently, seven curies of Iridium-192 that had been stolen from an oil contractor in April 2011 was recovered in a neighborhood in west Bogotá about three months later. Reports neither specify who stole the material nor their intentions.¹⁹

VENEZUELA

- In March 2005, one of two Iridium-192 capsules went missing from a barge. An additional one had gone missing later that month which was claimed to have fallen off a worker's truck. The capsules were encased in containers of depleted uranium and were both later recovered.²⁰
- In September 2005, it was reported that a storage area at the Venezuelan Health Ministry had been forced open and an undetermined amount of Cesium-137 capsules used to treat uterus cancer had been stolen. Similar to the recent incident in Mexico, the individuals were supposedly motivated not by the capsules, but rather the value of the containers used to store them.²¹
- In December 2005, police recovered stolen equipment containing Cesium-137 in the state of Anzoátegui. The same month, a truck carrying Iridium-192 had also been stolen in that state.²² Both materials pose significant risks and concern for public welfare if left unshielded.

ABOUT THIS REPORT

This report is drawn from a recent two-year project conducted by START's Unconventional Weapons and Technology Research Program to assess the potential nexus between transnational criminal organizations (TCOs), terrorists and RN smuggling in Central America and the Caribbean. The project included creating detailed profiles of 155 regional TCOs, extensive field work in the region, several case studies of prominent TCOs, a threat assessment tool for assessing the probability of collaboration, and an in-depth study of possible RN smuggling routes and methods into the United States.



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¹⁷ Winer, J. (2008, March 26). Colombia announces find of 66 pounds of uranium it says linked to FARC. *Counterterrorism Blog*. Retrieved from, http://counterterrorismblog.org/2008/03/colombia_announces_find_of_66.php.

¹⁸ Goodman, J. (2008, March 27). Colombia probes FARC ties to uranium seized in Bogota (update 3). *Bloomberg*. Retrieved from, <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a2kOfcdqP.ns>.

¹⁹ Authorities recovered in Bogotá radioactive source that had been stolen. (2011, July 12). *Semana*. Retrieved from, <http://www.semana.com/nacion/articulo/autoridades-recuperan-bogota-fuente-radiactiva-habia-sido-robada/242881-3>.

²⁰ Venezuela police find stolen radioactive unit. (2006, January 10). *Reuters*. Retrieved from, <http://www.planetark.com/dailynewsstory.cfm/newsid/34403/newsDate/10-Jan-2006/story.htm>.

²¹ Radioactive capsules stolen in Venezuela. (2005, September 21). *Xinhuanet*. In CBR weapons and WMD terrorism. *news.Nuclear Threat Initiative*. Retrieved from, <http://www.nti.org/db/cbw/2005/cbw092105.htm>.