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Examining the Risks of Nuclear Trafficking

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Abstract

The need to stop illicit trafficking of nuclear and radioactive materials around the world is undeniable and urgent. This issue is particularly evident due to the highly dangerous consequences of the risks involved, the known interest of terrorist groups in acquiring such materials, and the vulnerability of theft and diversion of such materials. Yet the phenomenon of nuclear trafficking remains a subject where the unknown dominates what is known on the subject. The trafficking panel at the Institute for Nuclear Materials Management (INMM) Workshop on Reducing the Risk of Radioactive and Nuclear Materials that took place in Albuquerque, New Mexico, March 10–11, 2009, dealt with some of the issues associated with nuclear trafficking. Different points of view on how to better address trafficking and thwart perpetrator efforts were discussed. This paper presents some of these views and addresses practical measures that should be considered to improve the situation.

The Institute of Nuclear Materials Management (INMM) held its third workshop on Reducing the Risk from Radioactive Materials on March 10–11, 2009, in Albuquerque, New Mexico. The second session of the workshop focused on Best Practices and Challenges in Addressing Nuclear Trafficking of Radiological and Nuclear Materials and significantly improved the participants' understanding of this not well understood phenomenon.¹ The panelists represented various points of view on trafficking and discussed measures the United States Government has taken to address the issue, both domestically and internationally, as well as what other countries have been doing regarding trafficking and what challenges still remain. The panelists included staff members from: the U.S. Nuclear Regulatory Commission (NRC), the U.S. Department of State, the Nuclear and Radiation Safety Service in Georgia, the James Martin Center for Nonproliferation Studies, and a visiting physicist from Nepal.

The U.S. has built a number of countermeasures to prevent nuclear trafficking domestically. The NRC plays a significant role in preventing trafficking in radiological and nuclear materials, and in addressing import and export operations. The NRC also regulates production and utilization facilities, equipment, special nuclear material (SNM), source materials, byproduct materials, deuterium, and nuclear-grade graphite for nuclear end use. Dual-use items are regulated by the U.S. Department of Commerce. The NRC has stringent rules in place, and foreign regulators and the International Atomic Energy Agency (IAEA) are involved as needed for export/import transactions. There have been no unauthorized shipments of Category-1 or -2 materials.

The IAEA's code of conduct for the safety and security of radiation sources was changed in December 2005. The NRC has encouraged the IAEA to use its trafficking database to utilize the

¹ The panelists on the nuclear trafficking panel included: Stephen Dembek, U.S. Nuclear Regulatory Commission; Elena K. Sokova, James Martin Center for Nonproliferation Studies; Grigol Basilia, Nuclear and Radiation Safety Service, Georgia; William Severe, currently at U.S. Department of State; Hari Dahal, Los Alamos National Laboratory; and Dana Weant, Consultant.

code of conduct to identify which of the reported incidents involve significant sources. At present, the database contains too many lost or misplaced small sources. It was also noted that recovered sources are often not reported to the IAEA; therefore, the ITDB may give an inaccurate impression.

The U.S. Department of State established the Nuclear Smuggling Outreach Initiative (NSOI)² to assist other countries in identifying problems and addressing shortfalls in preventing nuclear smuggling. NSOI activities are fully coordinated with all relevant agencies of the U.S. Government. The program involves the follow-up actions listed below:

- 1) Identify countries of concern; currently NSOI is on the third iteration of the country list.
- 2) Assess vulnerabilities (routes, incidents, etc.); communicate with CPB, advisors, embassy staff, DOE SLD staff, Material Protection Control and Accountability (MPCA) visitors, etc.
- 3) Create a joint action plan and a list of priority projects. Delegations/meetings are large, with high attendance from U.S. government and host government agencies, and are conducive to networking, giving participants a forum to talk among themselves and to check the joint action plan to avoid duplication and conflicts. Joint action plans are government-to-government political agreements rather than legally binding agreements.
- 4) Identify steps that recipients can accomplish alone and those requiring donors and seek to acquire donors through the 20 members of the Global Partnership Initiative. So far, eleven countries have donated to date, plus the EU and IAEA.

Today, NSOI has a total of 31 funded projects. The initiative has engaged the Ukraine, Kazakhstan, Georgia, Kyrgyzstan, Armenia, Tajikistan, Afghanistan, and Azerbaijan. Georgia is a great example of a successful initiative where projects to help Georgian border crossing efforts, their coast guard, and green borders areas. The program tries to reach countries that most need assistance more than others, however, there are many additional countries in need of assistance.

Georgia is a volatile region, with rampant corruption that has often been a transit country for nuclear trafficking. Four of 20 known Russian incidents involving highly enriched uranium (HEU) or plutonium (Pu) involved Georgia. Some of the well-publicized incidents are:

- 0.4-g Pu and 0.8-g LEU were seized in Tbilisi in 2000.
- 170 g HEU were seized in June 2003; it was about 90% enriched.
- HEU was seized in Tbilisi in February 2006, again about 90% enriched.

From 1996 to 2007, incidents in the area included eight border seizures, six stings or seizures resulting from intelligence tips, two seizures resulting from random searches, and five seizures with unspecified reasons. From 2006-2007, there were seven incidents, one with HEU, two involving LEU, and four with radiation. Four out seven of these seizures took place in Adjara, a former secessionist area bordering Turkey.

Regarding the 2003 seizure, it was 100 g and 70 g of UO₂ and U₃O₈ respectively. Border guards were tipped off, but the material passed two sets of monitors. Allegedly, the material was intended for a Muslim man named “Sadik” in Turkey. In the course of the investigation, the border guards almost let the trafficker go. The HEU reportedly came from the Novosibirsk fuel fabrication plant. A sample was provided to Russia and the rest was transferred to the U.S.

² ² <http://www.nsoi-state.net/>

Regarding the 2006 seizure, it was 79.5 g of 89.38% HEU. Oleg Khintsagov and three Georgian accomplices were arrested. There were some rumors that Khintsagov was a FSB operative. The seizure was the result of a sting operation that took a year to set up. The material passed through detectors on the Russian-Georgian border. The material allegedly came from Novosibirsk; but Khintsagov later said he didn't know where it came from. The smuggler allegedly has a cousin in the Customs Service who may have been of assistance. Khintsagov maintained that he had an additional 2–3 kg of HEU in an apartment in Vladikavkaz. Analysis showed that the material had been reprocessed from a production reactor and had U^{234} and U^{236} signatures.

The main lessons learned regarding all of these incidents is that information may be distorted, inaccurate, and incomplete in such cases. There are no mechanisms in place for border cooperation between countries. In addition, there are ethnic and territorial disputes in the area that exacerbate the situation and make it harder to gather more data and better-coordinate responses. There is high incidence of crime and corruption in the area, and it is difficult to monitor the borders and territory of Georgia because of the location and terrain.

Georgia has also had a number of accidents:

- In Lilo, discarded Co^{60} sources resulted in four fatalities. There is an IAEA report on the incident in Lilo.
- Khaishi, 11 border guards were injured by over 10 Cs^{137} sources with an activity of 10 Ci.
- Six radioisotope thermoelectric generators (RTGs) have been found from 1998–2001 with activities of 35 kCi, resulting in several deaths.
- In Poti, a $Co60$ source was found.
- A Pu-Be source, emitting 10×10^8 n/s, was found on a bus, but since the man carrying it had documentation on the source, it was never clear whether it was stupidity, vice smuggling, or a probe.

The latest case in Georgia occurred on March 3, 2009, when orphan $Cs-137$ sources were found by officials with pagers; the total inventory was 0.6 mCi.

Georgia's authorities have implemented a number of measures to curtail trafficking and secure sources. Georgia's Ministry of Environmental Protection and Natural Resources has primary responsibility for combating trafficking and collecting orphan sources. They establish regulatory controls and work with other appropriate Government of Georgia ministries and agencies to combat trafficking, such as, the Interior Ministry, customs, border police, etc. Overall, 287 orphaned sources have been recovered. The country set up four temporary storage sites; a central storage facility was being built at Mtskheta with DOE help, and a disused source storage site was being built with NRC assistance. In 2008, 520 sealed and 70 unsealed sources were relocated to Mtskheta, (a total activity of 3,000 TBq). 28 Cs sources remain in the disused source storage site.

Nepal is a small country, with a population of 29.5 million, is about 500×125 miles in size and does not have nuclear materials within its territory. Forty percent of its gross domestic product (GDP) is from agriculture, and unemployment is about 50%. Per capita income is about \$1100 per year. There are uranium deposits in Makawanpur, 60 miles from the capitol, but they are not being utilized. The Ministry of Population and Environment is responsible for monitoring radioactive waste in Nepal, however, there is no specialized agency focusing on radiation and nuclear issues. Part of this monitoring effort is to produce a radiation map of Nepal because the government has concerns due to lack of controls, infrastructure, and poor finances. Nepal has an

open border with India and incidents related to trafficking of arms and drugs have been reported. For example, on February 19, 2008, according to the Hindustan Times, 4 kg of alleged uranium were seized in India near the border with Nepal. It has also been reported that there was an attempt to smuggle 1 kg of uranium from an Indian mine to Pakistan through Nepal. Again, the border is open, and there are no detectors.

In a country such as Nepal with open borders and a lack of radiation detection equipment, terrorists have the potential to exploit the situation. There is little basic understanding among the population and local authorities on radiation and there are no plans for border monitoring. There is currently no system for training radiation workers and no disposal system. There is no information at present on the origin of sources in Nepal and apparently no repatriation monitoring or disposal plans.

Other general observations on nuclear smuggling made during the workshop were:

- Based on incidents reported, it has been noted that nuclear smuggling has been supply driven but that may change. Attention should be paid to poverty that causes corruption and theft, as well as abandoning sources.
- It also should be noted that scams divert attention from real cases, but scammers may also move real material.
- Some reports also underscore the unpreparedness of the people involved in investigations. For example, in the 2003 Georgian smuggling case, one of the Georgian guards actually tasted the HEU oxide, which reinforces the need for training.
- There was also a recent case of a radiation source being smuggled in (or hidden in) fertilizer.

In conclusion, in times when the Vice President of Columbia, Francisco Santos Calderon, states that fighters of the FARC had conducted negotiations for purchases of radioactive materials to make a dirty bomb using funds generated by drug trafficking³, we should continue pursuing our discussions and increasing our understanding of illicit nuclear trafficking. Forums such as the trafficking panel at the INMM workshop, allow for participation and discussion from experts with diverse backgrounds and different agencies. The questions and concerns of participants prompt panelists to improve our understanding of what has happened, what might have happened, what may be a trend, and what situational understanding about specific regions we currently possess. The benefit of learning more and acquiring situational awareness through public discussions and presentations is that it will improve our understanding of the illicit trafficking phenomena, improve our response, and lead us to be better-prepared for smuggling incidents whether they occur in the U.S. or abroad.

³ Has FARC Entered the Illicit Trade in Radioactive Materials? April 1 2008. WMD Insights.