

A study on the trend of the Illicit Trafficking of Nuclear Materials and Other Radioactive Sources

Jounghoon Lee*, Jae-Kwang Kim, Jung-Soo Kim

Korea Institute of Nuclear Nonproliferation and Control, 119 Munji-Ro, Yuseong-Gu, Daejeon, Korea

*Corresponding author: jhlee@kinac.re.kr

1. Introduction

As part of its overall programme on nuclear material security, the IAEA has maintained a database on the number of incidents of trafficking in nuclear materials and other radioactive sources since 1995 [1]. The ITDB's principle objective is to facilitate the exchange of authoritative information on reported incidents among states. The information collected from the various states is subjected to ongoing analysis by the Agency's ITDB staff to identify common trends and patterns, to assess threats, and to evaluate weaknesses in material security and detection capabilities and practices [2]. In this paper, we will discuss the trends and patterns which are analyzed using the ITDB from 1993 to 2006.

2. The Scope of the ITDB

The scope of the information collected by the ITDB is very broad. For analytical and reporting purposes, it is necessary to clearly distinguish among the various types of incidents it covers. The meeting of the ITDB National Points of Contact in May 2006 agreed on a revised categorization of incident types. Furthermore, these categories make up three broad groups as listed below [3]:

- Group 1 - Unauthorized possession and related criminal activities
- Group 2 - Thefts and losses
- Group 3 - Other unauthorized activities

The materials involved in incidents in the Database are classified into the following categories:

- Nuclear materials, including uranium, plutonium, and thorium
- Other radioactive materials, including sealed radioactive sources or bulk radioactive materials
- Other materials, including radioactively contaminated materials. (e.g. in the form of radioactively contaminated equipment, scrap, or agricultural products, and other materials involved in the incidents)

3. The Analysis of the ITDB from 1993 to 2006

Until 31 December 2006, the ITDB contained 1080 confirmed incidents reported by the participating states. Among the 1080 confirmed incidents, 275 incidents involved unauthorized possession and related criminal activity, 332 incidents involved theft or loss of nuclear or other radioactive materials, 398 incidents involved other unauthorized activities, and 75 incidents did not

meet any criteria in order to determine the category of the incident [2]. Several hundred additional incidents that have been reported in various open sources, but not yet confirmed or otherwise by the States involved, are also tracked by using the Database. These incidents are not included in these statistics, but are used in some analytical applications.

3.1 Unauthorized possession and related criminal activities, 1993-2006

About 27% of the 275 incidents involving unauthorized possession and related criminal activities reported to the ITDB during 1993-2006 occurred in 1993-1994. After 1994, the number of report per year dropped to a lower level. This has remained more or less stable over the years, averaging at about 16 incidents per year as shown in Fig 1. About 45% of the incidents involved radioactive sources, and 55% involved nuclear materials.

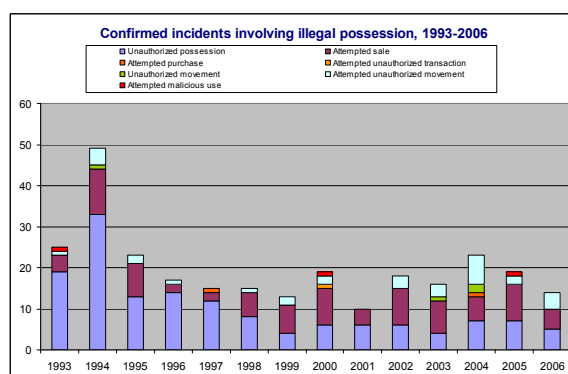


Fig. 1. Incidents reported to the ITDB involving unauthorized possession and related criminal activities, 1993-2006

Incidents involving illicit trafficking in nuclear or other radioactive materials, especially those where materials are offered for sale, indicate that there is a demand for such materials in illegal markets. The most incidents have been supply-driven with no pre-identified buyer. Buyers and repeat offenders have been identified in some cases. The principal motives for this have been profit. Other cases, however, have shown indications of malicious intent.

3.2 Thefts and losses, 1993-2006

The number of reported cases involving theft or loss increased significantly in 2006 as shown in Fig 2. This

increase, however, reflects improvements in reporting procedures rather than an actual increase in reported incidents. Reported thefts and losses have primary involved radioactive sources, such as ^{137}Cs , ^{241}Am , ^{90}Sr , ^{60}Co , ^{192}Ir and other radioisotopes.

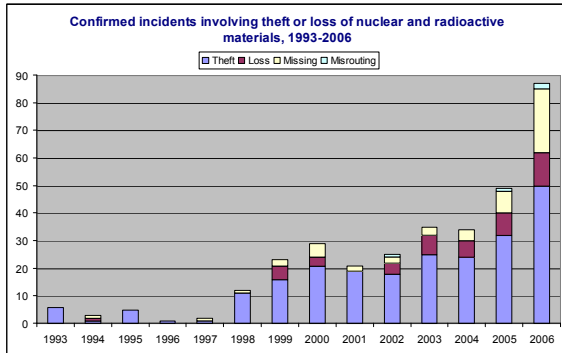


Fig. 2. Incidents reported to the ITDB involving theft or loss, 1993-2006

The reported information shows that sources used in portable or mobile industrial equipment, such as gauges or radiography devices, are most vulnerable for theft or loss. Sources are especially vulnerable during transportation by vehicle. A thief's intention is often not immediately apparent. Radioactive sources and devices can be attractive because of their perceived high resale value or the value of their shielding or encapsulation metals. Some cases, however, indicate a perceived demand for radioactive materials in illegal market.

3.3 Other unauthorized activities, 1993-2006

Incidents involving other unauthorized activities have mainly involved radioactive sources and radioactively contaminated materials. Fig 3 shows incidents reported to the ITDB involving other unauthorized activities during 2000-2006. Occurrence of such incidents is an indication of failures in systems to control and dispose of radioactive materials. They also show the weaknesses of these regulatory systems.

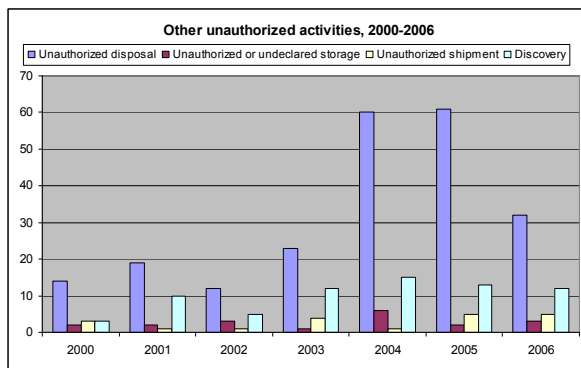


Fig. 3. Incidents reported to the ITDB involving other unauthorized activities, 2000-2006

4. Conclusions

Trafficking in nuclear material and radioactive sources is a global concern. From the ITDB, some trends and patterns were drawn. However, our own national illicit trafficking database program has not yet been established. In this regard, establishing a national ITDB is necessary for Korea. KINAC is going to make a national ITDB system. In the near future, KINAC will come up with illicit trafficking database for domestic and will be operating cooperated with KINS.

REFERENCES

- [1] G. Anzelon, W. Hammond, M. Nicholas, The IAEA's Illicit Trafficking Database Programme, IAEA-CN-86-92P, International conference on measures to prevent, intercept and respond to illicit use of nuclear material and radioactive sources, Stockholm (Sweden) 7-11 May 2001
- [2] IAEA, News center, Top Features, IAEA Illicit Trafficking Database (ITDB), 2006
- [3] IAEA, Office of Nuclear Security Department of Nuclear Safety and Security, ITDB Quarterly Report, 1st Quarter 2007