IAEA INCIDENT AND TRAFFICKING DATABASE (ITDB)

Incidents of nuclear and other radioactive material out of regulatory control

2016 Fact Sheet

The IAEA Incident and Trafficking Database (ITDB) system is a unique asset that assists the IAEA's Secretariat, participating States and selected international organizations in improving nuclear security. The ITDB staff maintains and analyses a growing collection of authoritative information, reported by participating States, on incidents involving illicit trafficking and other related unauthorized activities involving nuclear and other radioactive materials. This information is disseminated through the IAEA to participating States and certain international organizations. Reporting to the ITDB is voluntary. As of 31 December 2015, 131 States were participating in the ITDB programme (Annex). Cambodia, Guatemala, and Honduras joined the ITDB as participating states in 2015.

The ITDB is an essential component of the information platform that supports the implementation of the IAEA Nuclear Security Plan.

Scope of the ITDB

The ITDB System was established in 1995 to record and analyse incidents of illicit trafficking in nuclear and other radioactive material. It incorporates all incidents in which nuclear and other radioactive material is out of regulatory control.

In 2012 the title of the ITDB was aligned with the terms of reference which focuses on more than just 'illicit trafficking incidents' by explicitly including all nuclear and other radioactive material not under regulatory control. The name of *Incident and Trafficking Database (ITDB): Incidents of nuclear and other radioactive material out of regulatory control*, was agreed upon and was subsequently been adopted.

Communication with participating States is maintained through the network of national Points of Contact (POC). The ITDB System receives information from POCs on incidents ranging from illegal possession, attempted sale and smuggling to unauthorized disposal of material and discovery of lost radioactive sources.

The ITDB scope covers all types of nuclear material as defined by the Statute of the Agency (i.e. uranium, plutonium and thorium), naturally occurring and artificially produced radioisotopes and radioactively contaminated material, such as scrap metal. States are also encouraged to report incidents involving scams or hoaxes where material that is purported to be nuclear or otherwise radioactive, i.e. scams.

The Secretariat carries out analyses of all incidents in an attempt to identify trends and/or characteristics to assist in the prevention of misuse of nuclear or other radioactive material.

Confidentiality and security of ITDB information

The ITDB is a resource for information sharing among State Authorities and the IAEA. In order to protect the confidentiality of information reported by Member States, the ITDB upholds strict sensitive information handling and dissemination procedures. Information on specific incidents and analyses of reported incidents are only communicated via the POC network. Access to the complete database is limited to a small number of IAEA staff.

The information provided below represents a cross-section of the aggregated ITDB data that has been made available for the public domain.

ITDB highlights 1993–2015

Incidents reported to the ITDB demonstrate that illicit trafficking, thefts, losses and other unauthorized activities and events involving nuclear and other radioactive material continue to occur.

As of 31 December 2015, the ITDB contained a total of 2889 confirmed incidents reported by participating States. Of these 2889 confirmed incidents, 454 incidents involved *unauthorized possession and related criminal activities*, 762 incidents involved reported *theft or loss* and 1622 incidents involved *other unauthorized activities and events*[1]. In the remaining 71 cases, the reported information was not sufficient to determine the category of incident.

Unauthorized possession and related criminal activities, 1993–2015

Incidents included in this group involve the illegal possession and movement of nuclear material or radioactive sources and attempts to sell, purchase or otherwise use such material for illegal purposes. The persistence of these incident reports indicates a continuing nuclear security concern.

Confirmed incidents involving unauthorized possession and related criminal activities, 1993–2015

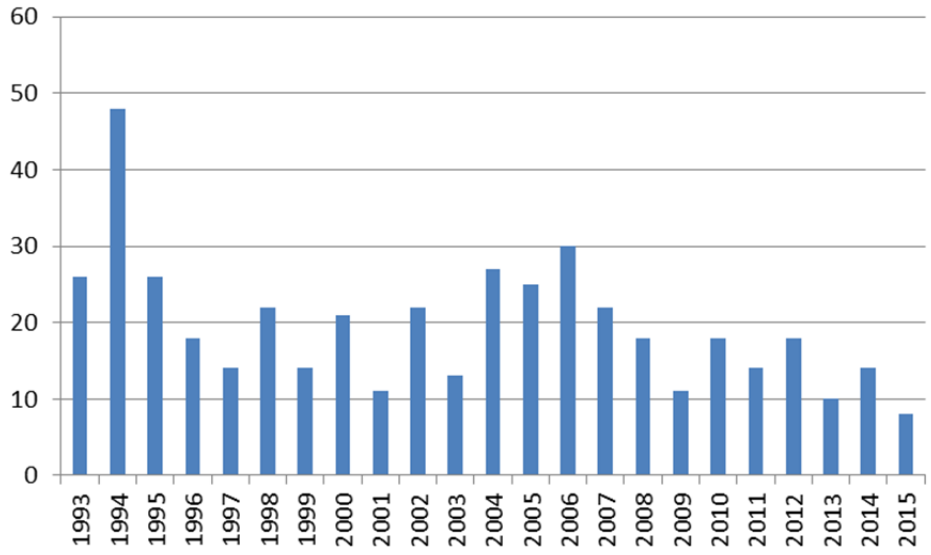

Figure 1 Incidents reported to the ITDB involving unauthorized possession and related criminal activities, 1993–2015.

The number of incidents reported to the ITDB involving unauthorized possession or other related criminal activities reached a peak in the early 1990s. However, the number of incidents of material out of regulatory control reported has subsequently remained relatively constant. It should be noted that due to a reporting time lag of sometimes up to 2-3 years, the total number of incidents recorded from 2013–2015 is likely to rise in line with previous years.

In the 1993–2015 period, confirmed incidents included highly enriched uranium (13), plutonium (3), and plutonium beryllium neutron sources[2] (5). Some of these incidents involved attempts to sell or traffic these materials across international borders.

A small number of these incidents involved seizures of kilogram quantities of potentially

[1] An incident may be categorized into more than one group—for example the theft and subsequent attempted sale of a radioactive source. Accordingly, the sum of the incidents in each group is greater than the total number of incidents.

[2] Plutonium smoke detectors were separately reported and totaled 17 in Group 1.

weapons-usable nuclear material, but the majority involved gram quantities. In some of these cases, there were indications that the seized material was a sample from a larger unsecured stockpile.

Incidents involving attempts to sell nuclear or other radioactive material indicate that there is a perceived demand for such material. The number of successful transactions is not known and therefore it is difficult to accurately characterize an 'illicit nuclear market'. Where information on motives is available, it indicates financial gain to be the principal incentive behind the majority of events. Many trafficking incidents could be characterized as 'amateur' in nature, as demonstrated by ad-hoc planning and a lack of resources and technical proficiency. However, there are a few significant cases that appear more organized, better resourced and that involved perpetrators with a track record in trafficking nuclear/radioactive material.

Thefts and losses, Group 2, 1993–2015

Incidents included in this group involve the theft or loss of nuclear material or radioactive sources from facilities or during transport. Theft can mark the beginning of an illicit trafficking incident. Thefts and losses are also indicative of vulnerabilities in security and control systems at the originating facility. The persistence of these incident reports indicates a continuing nuclear security concern.

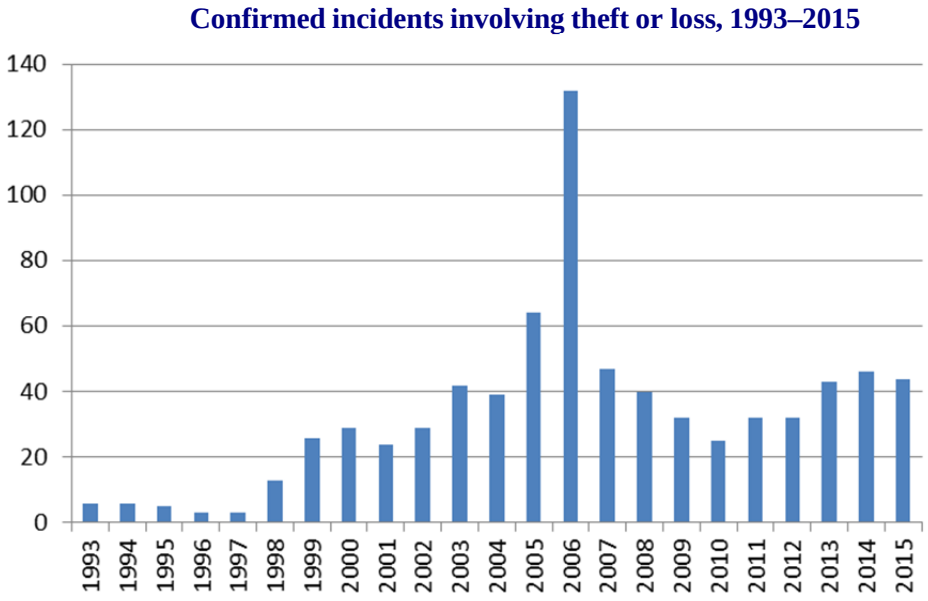

Figure 2. Incidents reported to the ITDB involving theft or loss, 1993–2015.

The number of incidents reported to the ITDB involving the loss or theft of material has steadily[3] increased from the late 1990s. In the 1993–2015 period, confirmed incidents included highly enriched uranium (3) and plutonium neutron sources (3)[4]4. Some of these incidents involved attempts to sell or traffic these materials across international borders.

The majority of thefts and losses reported to the ITDB involve radioactive sources that are used in industrial or medical applications. Devices containing radioactive sources can be attractive to a potential thief as they may be perceived to have a high resale or metal scrap value.

[3] It should be noted that the sharp increase in 2006 is related to a change in reporting procedures, rather than an actual change in the incident numbers.

[4] Plutonium smoke detectors were separately reported and totaled 6 in Group 2.

The majority of industrial sources that are reported stolen or lost are those used for non-destructive testing and for applications in construction and mining. The majority of such devices use relatively long lived isotopes such as iridium-192, caesium-137 and americium-241. The ITDB categorizes sealed radioactive sources, in accordance with IAEA Publication RS-G-1.9, from 1-5. The exposure of only a few minutes to a Category 1 source can be fatal. Category 5 sources can give rise to significant doses if not properly controlled. Those incidents reported to the ITDB in 2015 include incidents involving up to Category 2 sources.

The information received underscores the need to improve security measures for such sources as well as enhance the regulatory arrangements governing their use, storage, transport and disposal.

Medical facilities also use a wide range of radioactive sources. A significant proportion of incidents reported to the ITDB related to the loss of sources used in diagnostic and radiotherapy applications. These are generally the less dangerous Category 5 sources that when encapsulated pose a relatively low hazard to human health. Many hospitals also house and use high activity Category 1 sources, such as those used in radiotherapy treatment; however, it is rare to receive a report of an incident involving a source that has been used for these applications.

The recovery rate for Category 1-3 radioactive sources is high and can be attributed to the concerted effort made by the authorities to recover them. The majority of incidents relating to Categories 4 and 5 radioactive sources do not have a follow-up report confirming their recovery.

Other unauthorized activities and events, 1993–2015

Incidents included in this group primarily involve various types of material recovery, such as discovery of uncontrolled sources, detection of materials disposed of in an unauthorized way and detection of inadvertent unauthorized possession or shipment of nuclear or other radioactive material. The persistence of these incident reports indicates a continuing nuclear security concern.

Incidents involving other unauthorized activities and events, Group 3, 1993–2015

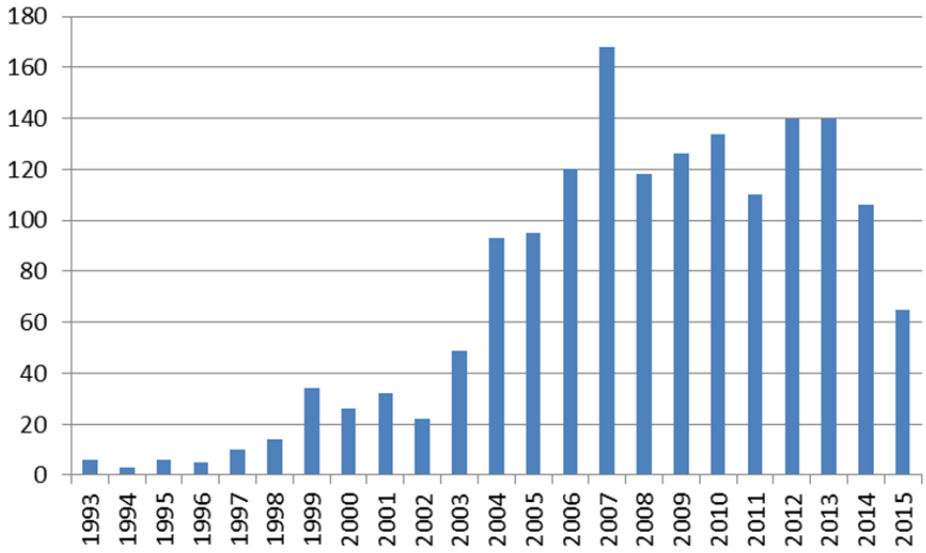

Figure 3. Other unauthorized activities and events, 1993–2015.

The majority of incidents involving ‘other unauthorized activities or events’, fall into one of three categories: the unauthorized disposal (e.g. radioactive sources entering the scrap metal industry), unauthorized shipment (e.g. scrap metals contaminated with radioactive material being shipped across international borders) or the discovery of radioactive material (e.g. uncontrolled radioactive sources). The occurrence of such incidents can indicate deficiencies in the systems to control,

secure and properly dispose of radioactive material. There is evidence that the increase in reporting of these incidents in the 2003-2005 periods is related to the increased number of radiation portal monitoring systems that were deployed at national borders and scrap metal facilities. However, over the last 10 years the number of reported incidents of this kind has stabilized to between 100 and 140 incidents per year.

Of concern is the repeated appearance of high enriched uranium in metal recycling streams and outside of regulatory control. Since 2009, the ITDB has received reports of scrap metal shipments contaminated with enriched uranium received by scrapyards the most recent of which occurred in 2014. In the 1993–2015 period, confirmed incidents included highly enriched uranium (14), plutonium (1), and plutonium neutron sources[5] (8).

In recent years, a growing number of incidents involved the detection of manufactured goods contaminated with radioactive material. This indicates a persistent problem for some countries in securing and detecting the unauthorized disposal of radioactive sources. The most common source of such contamination is the material (in most cases, metal) from which the product had been manufactured. This material may have originated from the metal recycling industry and, in the process of being melted down, became contaminated with material from a radioactive source such as cobalt-60. Such contaminated metal, if used to manufacture household goods, could pose a potential health problem to unsuspecting consumers.

Regional meetings on illicit nuclear trafficking information management and coordination

In 2015, 164 participants from 37 States, of which 29 were ITDB Participating States, attended one or more of the 6 regional and national information meetings that were conducted by the IAEA. These meetings are designed, inter alia, to enhance dialogue on the illicit trafficking and related nuclear security issues that most impact the region; help to raise awareness of the ITDB programme; and highlight the support the IAEA can offer to States in improving all elements of nuclear security.

Regional information meetings also contribute to strengthening the national, regional and international capacity to combat illicit trafficking in nuclear and other radioactive material through enhanced sharing, management and coordination of information.

The triennial ITDB Points of Contact meeting was held in Vienna, Austria in July 2015. A total of 98 participants representing 88 States and 2 international organisations attended the meeting. The Points of Contact Meetings provide the opportunity for information sharing among the ITDB Member States, increasing awareness and understanding of the illicit trafficking of nuclear and other radioactive materials and enhancing the understanding of the role played by the ITDB. The meeting is also an opportunity of POCs to contribute to the planning and development of the ITDB programme.

[5] Plutonium smoke detectors were separately reported and totaled 29 in Group 3.

Joining the ITDB

Non-participating States are encouraged to join the ITDB programme. States wishing to join the ITDB programme should contact the IAEA Office of Nuclear Security. States will be asked to nominate a national Point of Contact who will provide reports on incidents to the ITDB, receive ITDB information and reports produced by the Agency and facilitate responses to the Secretariat's enquiries on specific incidents. Information on the ITDB, the procedures for reporting incidents and copies of the Incident Notification Form will be provided to the POC.

Membership and Nominations

Membership applications and nominations of Points of Contact should be sent to:

Mr. Khammar Mrabit
Director, Division of Nuclear Security
International Atomic Energy Agency
Wagramerstrasse 5, P.O. Box 100
A-1400, Vienna, AUSTRIA
Tel: +43-1-2600-22299
Fax: +43-1-2600-29299 or -29250

Annex: States Participating in the ITDB as of 31 December 2015

1. Albania
2. Algeria
3. Argentina
4. Armenia
5. Australia
6. Austria
7. Azerbaijan
8. Bahrain
9. Bangladesh
10. Belarus
11. Belgium
12. Bolivia
13. Bosnia and Herzegovina
14. Botswana
15. Brazil
16. Brunei Darussalam
17. Bulgaria
18. Burkina Faso
19. Cambodia
20. Cameroon
21. Canada
22. Central African Republic
23. Chad
24. Chile
25. China
26. Colombia
27. Congo, Democratic Republic of the
28. Costa Rica
29. Côte d'Ivoire
30. Croatia
31. Cuba
32. Cyprus
33. Czech Republic
34. Denmark
35. Dominican Republic
36. Ecuador
37. Estonia
38. Ethiopia
39. Finland
40. France
41. Georgia
42. Germany
43. Ghana
44. Greece
45. Guatemala
46. Haiti
47. Honduras
48. Hungary
49. Iceland
50. India
51. Indonesia
52. Iran
53. Iraq
54. Ireland
55. Israel
56. Italy
57. Jamaica
58. Japan
59. Jordan
60. Kazakhstan
61. Kenya
62. Korea, Republic of
63. Kuwait
64. Kyrgyzstan
65. Latvia
66. Lebanon
67. Lesotho
68. Lithuania
69. Luxembourg
70. Madagascar
71. Malawi
72. Malaysia
73. Mali
74. Malta
75. Mauritania
76. Mauritius
77. Mexico
78. Moldova, Republic of
79. Mongolia
80. Montenegro
81. Morocco
82. Mozambique
83. Namibia
84. Nepal
85. Netherlands
86. New Zealand
87. Niger
88. Nigeria
89. Norway
90. Oman
91. Pakistan
92. Panama
93. Paraguay
94. Peru
95. Philippines
96. Poland
97. Portugal
98. Qatar
99. Romania
100. Russian Federation
101. Saudi Arabia
102. Senegal
103. Serbia
104. Sierra Leone
105. Singapore
106. Slovakia
107. Slovenia
108. South Africa
109. Spain
110. Sri Lanka
111. Sudan
112. Sweden
113. Switzerland
114. Tajikistan
115. Tanzania
116. Thailand
117. The Former Yugoslav Republic of Macedonia
118. Tunisia
119. Turkey
120. Uganda
121. Ukraine
122. United Arab Emirates
123. United Kingdom
124. USA
125. Uruguay
126. Uzbekistan
127. Venezuela
128. Vietnam
129. Yemen
130. Zambia
131. Zimbabwe