Illicit trafficking in nuclear and other radioactive materials: separating myths from realities

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Abstract: The paper addresses some entrenched myths concerning illicit trafficking in nuclear and other radioactive materials as well as, connected with them, threats of proliferation of nuclear weapons as well as nuclear and radiological terrorism in terms of insufficient reliability and accuracy of data and information on illicit trafficking incidents contained in relevant databases. Arguments are presented that, at least partly, the problem is derived from the dubious definitions given to the term 'illicit trafficking in nuclear and other radioactive materials' in IAEA documents, and domination of a regulatory approach to this term definition as well as data reporting and processing procedures. Some measures to improve analytical efforts to minimise deficiencies in this field are proposed.

Keywords: nuclear materials; radioactive materials; illicit trafficking; non-proliferation of nuclear weapons; illicit trafficking database; reporting procedures; nuclear security; nuclear terrorism; radiological terrorism; threat assessment; International Atomic Energy Agency.

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1 Introduction

Counteraction against illicit trafficking in nuclear and other radioactive materials (IT) is one of the prioritised directions in combating nuclear and radiological terrorism. This is evidenced by the fact that the leaders of 53 nations and four major international

organisations at the 2012 Seoul Nuclear Security Summit agreed to put combating illicit trafficking on the list of the important areas where the progress has to be urgently achieved to advance global nuclear security objectives.

The development of "*national capabilities to prevent, detect, respond to and prosecute illicit nuclear trafficking*" (Seoul Summit, 2012a) is impossible without an in-depth analysis of the processes and trends occurring in this field. In its turn, the quality of such an analysis is strongly dependent on the reliability and accuracy of relevant data and information reported to and contained in specialised databases. Of these, one of the most important is a database established at the International Atomic Energy Agency (IAEA) in 1995. This database was given special attention by the leaders of the participating States in The Hague Nuclear Security Summit Communiqué (Hague Summit, 2014). It plays a unique role in supporting IAEA and its member-states as well as other organisations' activities to improve nuclear security worldwide.

Nevertheless both this database and some others, including those at the national level, often suffer from data inaccuracy and insufficient reliability resulted in too much room left for subjective data interpretations which, at least sometimes, led to data misinterpretation and ambiguous conclusions. The domination of a subjective factor can create favourable conditions for some myths and stereotype formation that seems to be the case in combating IT in nuclear and other radioactive materials and associated with it nuclear and radiological terrorism. Besides, distortion of the pattern of global IT in nuclear and radioactive materials has not allowed identifying the most efficient measures undertaken both at the international and national levels to prevent acts of nuclear and radiological terrorism that seems to be important under the current conditions of the global economic crisis and the tendency to cut funds allocated for nuclear security measures worldwide. Further, these problems are considered in more detail.

2 Brief overview of the problem of Illicit trafficking in nuclear and other radioactive materials from the historical perspective

The concerns of the international community about cases of IT in nuclear materials emerged in the aftermath of the Soviet Union collapse when the further existence of the international regime of nuclear non-proliferation was put into question. At that point some states and international organisations, first of all IAEA, tried to address the problem of IT in nuclear and other radioactive materials in terms of threats associated with the possibility of nuclear weapons falling into "wrong" hands bearing in mind that the former Soviet republics were suffering from social and political turmoil, accompanying the processes of Soviet empire dissimilation and formation of new independent states, one of the direct results of which was, in particular, weakening of state control over nuclear weapons, nuclear materials and nuclear facilities.

Fortunately, despite (and partly, may be, due to) a lot of alarmist assessments and fears addressing nuclear weapons security in the former Soviet republics, apparently, proved to be somewhat overestimated (just basing on the lack of incidents with nuclear weapons stolen from military facilities or in military transport). That was not the case for nuclear materials especially those in the civil sector.

Thus, the world community faced a relatively new problem – IT in nuclear materials, but the risks associated with it were mainly perceived in terms of nuclear weapons proliferation. Nevertheless, according to Mowatt-Larssen (2010), it was also a period of

time that the first revelations of al Qaeda's interest in acquiring nuclear capabilities were attributed to. Accordingly, in this period (1995) a major international tool for supporting global efforts to combat illicit trafficking in nuclear materials – IAEA Database on Illicit Trafficking (IAEA ITDB) – was established and included the incidents occurred since 1993. A little bit later it became clear that the number of incidents reported to this database with their peak in 1994 (IAEA, 2014a) reflected the problems with nuclear security in the global dimension.

Until 9/11 the problem of IT had been recognised by the international community as important one but, mainly, in terms of threats of nuclear weapons proliferation. This statement can be illustrated with, e.g., the frequency of references to the term "*terrorism*" and its derivatives in the IAEA annual reports. At the first time, the term was once mentioned only in 2000 report (IAEA, 2001). One more example of underestimation of the nuclear and radiological terrorism threats at the international level by the end of 1990s is the fact that the 1999 Strategic Concept of the NATO did not even mention terrorism and, respectively, nuclear terrorism among "*risks and uncertainties facing the members of the Alliance and other states in the Euro-Atlantic region*" (NATO, 2001).

The 9/11 attacks have dramatically changed the global security pattern due to an apprehension by the international community of the level and scope of terrorism threats, in general, and nuclear and radiological threats, in particular. On that day "a pendulum" of perception of nuclear and radiological terrorism threats (along with terrorism involved other weapons and materials of mass destruction) "swung" in reverse, putting counteraction to IT in nuclear and other radioactive materials on the list of the priorities for the international community.

In the aftermath of 9/11 much attention was paid to prevention and interdiction of, as well as response to IT incidents worldwide by means of development and introduction of various international instruments both legally and non-legally binding, implementation of various programmes, projects, initiatives, etc. Their formal peak may be attributed to the period of 2010–2012, when the nuclear security issues have been brought to the highest political level due to launch of a nuclear security summit process. As of the IT issue, during the Seoul Nuclear Security Summit the participating world leaders approved the Seoul Communiqué agreeing to make "*every possible effort to achieve further progress*" in thirteen "*important areas*" (Seoul Summit, 2012b), and combating illicit trafficking was recognised one of them. This commitment was reaffirmed and developed during the Hague Nuclear Security Summit (2014).

At the same time, the large scale of the efforts undertaken and planned has resulted in considerable inertia acquired by the processes in the field of nuclear security. This seems to be true for combating IT in nuclear and other radioactive materials partly due to the approaches widely recognised as early as 1990s.

At that time the IAEA ITDB, while mainly addressing threats of nuclear weapons proliferation, from the very beginning has included records on a variety of incidents involved not only nuclear materials but also other radioactive materials including scam cases in which real materials have not been involved. Besides, the IAEA ITDB office requested from the national point of contacts to report about *all incidents* when materials were found *out of regulatory control* that is, apparently, much broader than illicit trafficking cases. It was substantiated on a ground to have a full picture of national and international capabilities to prevent, interdict, and respond to illicit trafficking cases that is directly connected with the capabilities of doing the same efforts relatively to materials

being out regulatory control. The problems caused by this, at a glance quite rational, approach are discussed in more detail below.

Other major problems in this field arise from the insufficient reliability of data and information from even widely recognised sources such as IAEA ITDB. The situation has been aggravated by the lack of a generally acknowledged definition of "*illicit trafficking*" and the shortcomings of reporting procedures to the IAEA ITDB.

Also, the lack of criteria for evaluation of efficiency of national and international efforts to combat illicit trafficking in nuclear and other radioactive materials has had a negative influence on IT data reliability through the application of different approaches to reporting procedures both at the national and international levels.

In the following section the above mentioned problems are discussed in more detail.

3 Reliability of data and information on illicit trafficking incidents and lack of widely recognised criteria of the successful efforts in this field

Despite much attention given to illicit trafficking in nuclear and other radioactive materials relevant statistical data are rather confusing both at the national and international levels, which is connected, at least partly, with the lack of a widely recognised definition of the term "illicit trafficking". Really, already first IAEA technical documents devoted to this problem offered such a definition "*Illicit trafficking is the receipt, possession, use, transfer or disposal of radioactive material without authorization*" (IAEA, 2002a). Although there was a reservation arguing that the definition "*is much broader than the term as it is generally understood by police, customs and other law enforcement bodies*" in the IAEA publications the approach applied to define the phenomenon was widely used and often resulted in mixing statistics concerning both inadvertent movement of and illicit trafficking in nuclear and other radioactive materials in global and national dimensions.

This statement may be exemplified with the IAEA database title which only in 2013 has been changed from "*Illicit Trafficking Database*" (*ITDB*) to "*Incident and Trafficking Database*" (the title abbreviated remained the same) (IAEA, 2014b), whereas from the very beginning it contains the records about all incidents involving radioactive (including nuclear) materials out of the regulatory control. It is worth to note that it is not common that the terms "*illicit trafficking*", or its synonyms "*illicit traffic*" and "*illegal trade*" be used in a broader sense for other goods under legislative control (see, for instance, United Nations, 1988). The last approach covering all incidents associated with relevant materials beyond the regulatory control is more typical for IAEA and national nuclear regulators.

The rationale to integrate records of illicit and inadvertent actions is underpinned with a commonly recognised explanation that reporting about all incidents with radioactive materials allows having a fuller pattern not only of material movements but also of national and international capabilities to prevent and interdict such movements, especially across borders.

Giving credit for these provisions and not going into detail, it is necessary to note that such treatment of statistical data may affect the process of an analysis of the IT in nuclear and other radioactive materials situation, since it may provoke either unintentionally of intentionally a psychological colouring of data and abstaining from attempts to apply more accurate analytical tools to gain an insight into the problem. Really, if undue

attention is paid to differentiation between illicit and inadvertent cases, then perception of a threat in the case of several illicit trafficking incidents a year will be emotionally essentially smaller from that of several hundred incidents for the same period of time, even if one is aware of a mixing nature of the records. Actually, the tendencies regarding the incidents involved criminal activities with nuclear and other radioactive materials might be paled or, even, lost against the background of changes in statistical data on radioactively contaminated metal which constitute the lion's share of all incident records in the IAEA ITDB.

At the same time, when stressing importance of singling out malicious actions with nuclear and other radioactive materials one cannot but mention a principal shortcoming inherent in the investigation process: until investigation completion and a judgment at law release it is often impossible to make a conclusion whether or not there are malicious intentions regarding nuclear and other radioactive materials, while it is recommended to report to, for example, the IAEA ITDB as soon as possible.

Besides, one more factor affects procedures for reporting on incidents and for analysing the situation concerning IT both at international and national levels – lack of internationally recognised criteria for evaluation efficiency of national and international efforts to combat IT in nuclear and other radioactive materials. For more than 10 years at international forums attendees could encounter on a time-to-time basis discussions on how to treat a high (low) number of incidents involved the above mentioned materials: as an evidence of big (minor) problems with nuclear security or, vice versa, high (low) efficiency of measures undertaken to detect and interdict IT cases.

Due to this opaque situation with evaluation of efforts to combat IT at the national level, for example, some authorities (first of all, those charged with IT cases detection and interdiction) might be more interested in reporting as many incidents as possible even if some of them might be incorporated in one case, while other authorities (charged with accounting for, control and physical protection of materials) might be prone to record fewer incidents.

Arguably, the fact narrated below can be treated as a revelation of such interests exerting influence not only on a national IT situation pattern but also on global one.

Really, according to the IAEA ITDB annual fact sheets released by the Agency after 2006, the sharp increase in 2006 was recorded for the confirmed incidents involving theft or loss, but according to the IAEA, this peak "*is related to a change in reporting procedures, rather than an actual change in incident numbers*" (IAEA, 2014c). Interestingly, that the formulations of IAEA's explanation of this peak has been to somewhat changed. In fact, in the 2008 the explanation was the following: "*The significant increase of the number of reported cases involving theft or loss in 2006 is due almost entirely to a change in the reporting practice* ***of one state that greatly increased their number of reports. In 2007 the same state reverted to its prior practice*** (emphasis added), *but even when this decrease is accounted for, there may be a decline in these types of cases in 2007, although some of the decline may be due to delayed reporting rather than actual decrease in incidents' occurrence*" (IAEA, 2008).

Thus, the changes in reporting procedures (new procedure adoption and then – return to the previous practice) in only a single member-state led to reshaping of the IT global pattern. It is noteworthy that both data submitted to the IAEA ITDB according to the new procedure adopted and those submitted after its cancellation are still present in the annual fact sheets released by the Agency. Summarising the situation around 2006 peak in the IAEA ITDB records one can make a conclusion that data reporting and processing

procedures and methods should be essentially improved to be a basis for serious analytical efforts relatively to IT in nuclear and other radioactive materials.

If such a conclusion is true for the IAEA ITDB, probably the most reliable source of publicly available information in this realm, all the more it is true for a lot of relevant national databases (if any).

4 The myths and realities of illicit trafficking in nuclear and other radioactive materials

Such a situation with the reliability and accuracy of the data concerning IT in nuclear and other radioactive materials makes raises questions some ideas about IT and associated with it threats and risks posed by nuclear and radiological terrorism that are widely recognised and entrenched. They are often used for explaining the trends, substantiating efforts to be undertaken and in assessing the threats and risks in this realm. Some of them are listed below.

1 Prioritised attention should be paid to IT in nuclear and other radioactive materials since ignoring this phenomenon would lead to growing threats and risks associated with nuclear weapons proliferation as well as nuclear and radiological terrorism.

2 The IAEA ITDB is an effective tool to support IAEA, participating states and certain international organisations in improving nuclear security.

3 The most challenging situation concerning illicit trafficking in nuclear and other radioactive materials over the recent two decades has been in the NIS. It is threatening the global nuclear security regime.

4 Customs officials, border guards, and police forces detect numerous attempts to smuggle and illegally sell stolen sources.

5 The most attractive material for terrorist groups seeking to acquire nuclear weapons is HEU.

Are these ideas and views well-justified and sufficiently backed by the data from the IAEA ITDB and from elsewhere? Are all of them still actual?

When attempting to answer the above questions, first of all, one can argue that no categorical conclusions can be made deriving from the IAEA ITDB and similar ones because of insufficient reliability and accuracy of data and information they contain.

The dubious definitions of the illicit trafficking in nuclear and other radioactive materials including incidents involved these materials being out of regulatory control make an essential contribution to confusing the pattern both at the national and international levels. Furthermore, the lack of commonly accepted criteria to evaluate national efforts in combating IT in nuclear and other radioactive materials leads to different interpretations of a large number of incidents (cases) varying, e.g., from insufficient materials security level to peculiarities of reporting procedures in one country or another. In its turn, it leads to different approaches to reporting procedures implementation. Really, authorities charged with interdiction of IT are prone to have a large number of relevant records (e.g., through registration of separate incidents even if they are unified in one case), whereas nuclear regulators, in some countries, would like to have low numbers of IT incident records reflecting their successful regulatory efforts.

Extraction of incidents associated with malicious intentions from the all IAEA ITDB data arrays gives no striking illustrations of threats and risks associated with nuclear and radiological terrorism. Really, according to the Center for Nonproliferation Studies (CNS, 2011) only four cases (three in Georgia and one in Moldova) of HEU attempted sales were registered from 2002 to 2012. The total mass of the HEU seized in these cases is less than 200g that is 125 times smaller than so-called *significant quantity* (IAEA, 2002b). Also, it should be taken into account that the most of cases, e.g. in 2009–2010, involved nuclear material found in the metal scrap. Besides, it is worth to note that in the above mentioned attempted sales of nuclear material, practically, in 100% of cases, criminals tried to sell materials to operatives under cover. This allows making a conclusion that so far relying on facts presented in Mowatt-Larssen (2010), statistics of incidents occurred from 2002 to 2012 gives us no evidence on serious interest of terrorists in nuclear materials, in general, and HEU, in particular.

The previous conclusion correlates with such an extremely important fact that until now terrorists have committed acts of neither nuclear nor radiological terrorism against the background of general growth in the number of terrorist acts. Really, according to the Global Terrorist Database of National Consortium for the Study of Terrorism and Responses to Terrorism (START, 2014), the total number of terrorist acts in the world increased several times over 2001–2011 period.

Bearing in mind, that in contrast to even a rude nuclear explosive device, manufacture of a so-called "*dirty bomb*" (just a combination of conventional explosive and radioactive material) or other radioactive dispersion device is not a difficult task in terms either of a design or material accessibility, the fact mentioned in the previous paragraph can be only explained so that terrorists were not interested in such methods of attacks within the period of time specified (i.e. in the aftermath of 9/11). Otherwise, there is nothing to do but be surprised about the lack of such attacks, as it was made in the Project Geiger's presentation (Lippert, 2011).

The fact that in the majority of incidents only small (gram) quantities of nuclear materials of a great concern were seized in IT in nuclear and other radioactive materials is usually explained in such a way that "*in some of these cases there were indications that the seized material was a sample from a large unsecured stockpile*" (e.g., in IAEA, 2014d). But, this explanation could be acceptable only for a while. Otherwise, we have to acknowledge that neither intelligence services nor law enforcement bodies worldwide proved to be able to detect and seize larger nuclear material quantities from unsecured stockpiles in IT, while being successful in killing terrorist leaders (including Osama bin Laden), though, in reality, security of terrorist leaders cannot be lower than security of some, even important, assets planned to be used by terrorists some day in the future.

The current situation concerning nuclear and radiological terrorism threats as well as associated with them the global pattern of illicit trafficking incidents involved nuclear and other radioactive materials may be much better described relying upon the early opinion of Brian Michael Jenkins (Jenkins, 1987), who writing about a new breed of terrorist seeking unconventional means of attack, including chemical, biological, radiological, and nuclear weapons, and trying to inflict massive destruction, noted that "*most terrorists, however, do not want to cause massive destruction*". He argued, that, as a general rule, terrorists favour well-proven methods – "*bombings, assassinations, armed assaults, kidnappings, hijackings, and barricade and hostage incidents*" and would continue to use these techniques of terror as long as they can accomplish their goals.

This major Jenkins' conclusion looks like more than true bearing in mind powerful pressure on the terrorists and fatal casualties they suffered from due to international efforts.

5 Conclusions

IT in nuclear and other radioactive materials is a global phenomenon stemming from a number of reasons, one of the major of which is an undue level of materials security worldwide. IT issues require, undoubtedly, scrupulous attention in terms of threats of nuclear weapons proliferation as well as nuclear and radiological terrorism. In the aftermath of 9/11 these threats have been perceived as the most dangerous ones the international community has ever faced. This perception has led to unprecedented concerns and fears with regard to nuclear security issues including those related to IT.

Due to the global nuclear security summit process all problems associated with counteraction against nuclear and radiological terrorism were brought to the highest political level. This is also true for combating IT recognised as one of the important areas where global progress has to be made.

The global counterterrorist efforts appear successful in some critical directions. Despite a general increase in the number of acts committed, within a few years in the aftermath of 9/11 some indications seem to be obvious concerning the threats associated with nuclear and radiological terrorism and risks connected with IT in relevant materials. Really, no facts of either nuclear or radiological terrorism acts committed; no confirmed evidences of terrorists' special interest in nuclear and other radioactive materials, including HEU.

Obviously, the tough counterterrorist measures could not but give serious results – terrorist resources have been considerably undermined in some areas.

At this stage, probably, it is necessary to reassess the risks posed by nuclear and radiological terrorism, as well as illicit trafficking in nuclear and other radioactive materials. But this should not be treated as a call for neglecting the above mentioned threats. Under the conditions of the world economic crisis resulted in cutting the funds allocated to security sectors in a lot of countries one of the crucial questions is: what is a main reason forcing terrorists to abstain from attempts to use not only nuclear but also other radioactive materials in their attacks. An answer, probably, could be found due to an in-depth analysis of intelligence information as well as information from different databases, first of all, IAEA ITDB, for which some procedures and data processing should be improved.

To essentially improve analytical efforts the following steps seem to be obvious:

1 Illicit trafficking cases should be (where practically applicable) clearly singled out from an array of information of all incidents where materials were found beyond the regulatory control. The first step in the due direction was made through changing the title of the relevant IAEA database (see above).

2 The above measure should be accompanied by giving an unambiguous definition of the term "illicit trafficking" relatively to nuclear and other radioactive materials.

3 IAEA ITDB operation should be improved through: improvement of data reporting procedures and their processing to avoid influence of unreasonable innovations on

the illicit trafficking global pattern; strengthening analytical functions of its relevant subunit; developing criteria for evaluation of national governments' efforts in counteraction illicit trafficking.

4 The relevant subunits of other international organisations involved (INTERPOL, EUROPOL, World Customs Organization, etc.) should strengthen analytical component in their efforts to combat illicit trafficking in nuclear and other radioactive materials.

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