ILLICIT TRAFFICKING OF RADIOACTIVE MATERIAL IN HUNGARY

Ferenc GOLDER

Institute of Isotopes, H—1525 Budapest, P.O.Box 77. Hungary

INTRODUCTION

There is a growing international awareness of illicit trafficking in radioactive material. The problem is not new and for years there have been sporadic reports of such incidents from all over the world.

The problem cuts across at least three primary issues: safety, crime and security. There is a threat to the safety of both the smugglers and the innocent persons they affect, but the lead for the prevention of smuggling lies with law enforcement agencies with support from safety agencies in the case of hazardous contraband. In the case of clandestine movements of nuclear material, the lead lies with security services, again with appropriate support from radiation protection agencies. Hungary, due to its geographical location is a convenient region for illegal transit of nuclear material between source and target countries.

POSSIBLE ORIGINS OF ILLICIT TRAFFICKING

There are many causes or motives for illicit traficking in sources. A few of the more typical examples are:

— Loss of control or loss of security of sources e.g. those in long—term storage, due to failures of the responsible authorized user and/or the regulatory infrastructure.

— Sources that are unknowingly contained in devices or equipment, eg. industrial gauges which are subsequently sold as scrap metal.

— Materials slightly contaminated with radioactivity which are released without clearance rules and reappear in domestic or international markets; most typically in the form of scrap metal or recycled scrap metal. The radiation risk is usually low.

— Sources placed in long term storage rather than being sent to waste disposal because of the prospect for future use or the high cost of disposal, and which are not adequately protected.

— Sources, as well as nuclear materials, which are trafficked with the idea that they could be useful in a nuclear weapons programme or as a threat. This is deliberate, and persons involved usually know that they are breaking the law. Very often, persons committing such offenses have very little understanding of the technological utility of such materials, their hazards or their market value. In these

kinds of cases, the materials are often obtained in one country and attempts made to deliver or market it in anothe

PREVENTION

An important precondition for preventing illicit trafficking is the existence of a national system for control of regulated radioactive sources and a means for detecting the material outside the control of the system.

The main requirements of regulations administered by the Regulatory Authority aimed at preventing illicit trafficking are requirements to obtain authorization for possession of sources, requirements for the security of sources, requirements to maintain records of receipt, use and transfer of sources, requirements to conduct periodic inventories of sources to ensure that they are in their assigned locations and are secure, requirements regarding prompt notification of the Regulatory Authority of lost materials, or loss of control over sources.

The national control system of radioactive sources in Hungary

All radioactive materials are under regulatory and administrative control in Hungary with particular attention being given to sealed sources. The main features of the national control system are: (a) regulatory provisions for import/export and user licensing, control and inspection, (b) and itemized national accounting system from production to disposal.

Comprehensive legislation concerning the licensing, safe handling and control of radioactive sources, dates back to 1964 when the Order 1/1964 was issued by the Ministry of Health.

This order confirmed the existing practice and prescribed inter alia proper accounting for radioactive materials both at user and national levels. First of all, licensed users had to keep consecutively numbered uniform record books and authenticated by a designated institution (Institute of Isotopes) into which record books data of all receipts, use, disposal and transfer have to be entered.

One of the supporting documents should be the certificate issued by the producer or by the trading company. These certificates form the basis of the centralized accountancy covering all radioactive materials ever produced in or imported into the country. In addition any transfers between users should have been approved by the Institute prior to shipment, and final disposal of sealed sources can only be affected upon prior approval of the Institute.

On these conditions a central accountancy system has been set up, providing the basic information on all radioactive materials in the country.

Data of all imported and domestically produced radioactive products are now computerized. In the case of sealed sources, data of all items ever registered in the country have retrospectively been fed into a HP 3,000 GX Microcomputer.

CRIMINAL (SMUGGLING, THEFT) ILLEGAL MOVEMENT OF RAM

Appearance of illicit trade of nuclear materials (NM) in the last few years proved to be a serious challenge for our domestic safeguards system. The first batch (26 UO_2 pellets) containing 0.374 kg natural uranium was confiscated in 1991. Eight additional cases have become known since that time. All but one case involved reactor fuel pellets or rods. One case involved an empty container with depleted uranium shielding. Altogether 21.7 kg depleted, 4.6 kg natural, and 2.5 kg low enriched uranium have been confiscated. Due to the lack of enrichment, fuel fabrication, and reprocessing facilities, we do not have large amounts of nuclear material in bulk form. As a consequence, all of the confiscated materials came from abroad and were transported by road.

Smugglers were arrested either at the border or inside the country. They were of different nationalities, including Hungarian. The isotope abundance of nuclear materials have been determined by non—destructive analyses (NDA) based on high resolution gamma—ray spectrometry, and using intrinsic calibration method. To determine the total element weight or element concentration, however, required specific considerations as — in addition to the unknown element concentration — the necessary absorption corrections for the matrix, cladding, and geometry as well.

Consignment not in compliance with the relevant regulations

In 1993 and 1994 scrap metal was transported by rail from Hungary to an Italian port. The port authorities detected radiation level above the background on one point of the wagons, so they were sent back to Hungary. After careful and tiresome investigations, no radioactive material was found among the scrap metal, however, the outside of the wagons was contaminated. The origin of the radioactive contaminations has been unknown.

In 1996 two trucks carrying scrap metal have been sent back to Hungary because radiation level has been measured on the surface of the truck. Among the scrap, instruments containing radioactive material have been found.

INTERVENTION

Intervention refers to action taken to bring a source under control and/or bring a situation under appropriate radiation protection control. At the beginning of this year an order has been issued in which, an intervention is required where information, or suspicion, exists about sources not being under appropriate control. The nature of the intervention required depends very much on the particular circumstances, eg the type of source, where it is located and potential pathways of exposure. The most important elements of that order are:

— Notification
— Methods for securing the source/s

— Temporary storage arrangements
— Measurements to be made
— Transport arrangements
— Information exchange

Circumstances leading to intervention include:

— detection of unauthorized or uncontrolled sources through radiation monitoring
— a report about radioactive sources having been found
— a report about something suspected to contain radioactive source/s
— a report about in accident involving, or suspected to involve, sources.
— a report about the detection of instances of non—compliance with the transport regulations
— a report about illegal transboundary movement of radioactive source/s.

Intervention is essential for discouraging traffickers as well as for regaining control where sources are being unwittingly handled or transported.

MONITORING

Radiation monitoring is an essential part of the control of radioactive and contaminated materials. It is particularly important in instances where control or security over materials has been lost and as an adjunct to intervention.

Monitoring should be performed at control points which have the greatest potential for identifying illicit trafficking, i.e., boundaries of nuclear and radiological facilities, customs check points, etc.

Concerning this requirements at the busiest frontier station a sensitive radiation monitor system has been installed to detect the presence of radiation from vehicles passing the border. In addition, the customs officers at the same border station have been supplied with portable dose—rate meters.

Regarding the future actions, it has been decided to continue the education and training of the customs personnel police and intelligence service involved in measuring radiation, and provide them with the proper instruments.

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SUMMARY

Hungary, due to its geographical location is a convenient region for illegal transit of nuclear material between source and target countries. In recent years nine cases have became known and altogether 21.7 kg depleted, 4.6 kg natural, and 2.5 kg low enriched uranium have been confiscated.

A brief summary is given of the possible origin of the illicitly transported radioactive material. The most important elements of the security of sources including the national and accounting system of radioactive material and the intervention plans are discussed.