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Prevention of the inadvertent movement and illicit trafficking of radioactive materials

Jointly sponsored by IAEA, WCO, EUROPOL and INTERPOL



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FOREWORD

By international agreements, the movement of all radioactive materials within and between States should be subject to high standards of regulatory, administrative, safety and engineering controls to ensure that such movements are conducted in a safe and secure manner. In the case of nuclear materials, there are additional requirements for physical protection and accountability to ensure against threats of nuclear proliferation and to safeguard against any attempts at diversion.

The results of the terrorist attacks of September 2001 emphasized the requirement for enhanced control and security of nuclear and radioactive materials. In this regard, measures are being taken to increase the global levels of physical protection and security for nuclear materials. In like manner, efforts are underway to enhance the safety and security of radioactive sources so prevalent in many industries and health care facilities. It follows that detection of radioactive materials (nuclear material and radioactive sources) at borders is an essential component of an overall strategy to insure that such materials do not fall into the hands of terrorist groups and those criminal organizations that would supply them. Shipments of radioactive materials warrant the attention of law enforcement and regulatory agencies to ascertain legality, and to prevent diversion and illicit trafficking.

Experience in many parts of the world continues to prove that movements of radioactive materials outside of the regulatory and legal frameworks continue to occur. Such movements may be either deliberate or inadvertent. Deliberate, illegal movements of radioactive materials, including nuclear material, for terrorist, political or illegal profit is generally understood to be illicit trafficking. The more common movements outside of regulatory control are inadvertent in nature. An example of an inadvertent movement might be the transport of steel contaminated by a melted radioactive source that was lost from proper controls. Such a shipment may present health and safety threats to the personnel involved as well as to the general public.

States have the responsibility for combating illicit trafficking and inadvertent movements of radioactive materials. The IAEA co-operates with Member States and other international organizations in joint efforts to prevent incidents of illicit trafficking and inadvertent movements and to harmonize policies and measures by the provision of relevant advice through technical assistance and documents. As an example, the IAEA and the World Customs Organization (WCO) maintain a Memorandum of Understanding (MOU) (1998) to promote co-operation at the international level in order to improve the control of radioactive materials. At the time of the drafting of this report, a similar MOU between the IAEA and the International Criminal Police Organization (INTERPOL) is pending.

There are a number of measures that must be undertaken by States to combat the illicit trafficking and inadvertent movements of radioactive materials. These measures are, generally, shared between the regulatory and law enforcement agencies as part of a State's national arrangements. This Technical Document (TECDOC) will primarily be of interest to customs, border police and other law enforcement bodies. The report outlines the typical regulatory framework so that customs, police and other law enforcement staff are aware of the measures being taken to prevent loss of control. It also deals with the roles of customs, border police and other law enforcement bodies in the prevention of the inadvertent movement and illicit trafficking of radioactive materials.

This is the first of a group of three TECDOCs on inadvertent movement and illicit trafficking of radioactive materials, that are co-sponsored by WCO, EUROPOL and INTERPOL. The second is entitled “Detection of Radioactive Materials at Borders” (IAEA-TECDOC-1312), and the third “Response to Events Involving the Inadvertent Movement or Illicit Trafficking of Radioactive Materials” (IAEA-TECDOC-1313). The IAEA officer responsible for these publications was B. Dodd of the Division of Radiation and Waste Safety.

EDITORIAL NOTE

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1. INTRODUCTION

1.1. Definitions

1.1.1. Prevention

The definition of “prevention” as used in this publication is intended to include measures that will be undertaken by regulatory authorities competent in radiation protection and safety, as well as those undertaken by police, customs and other law enforcement bodies.

Prevention is defined as: “Any measures to be taken by a regulatory body to avoid loss of radioactive materials from authorized control, as well as any appropriate measures taken by customs, police and other law enforcement bodies to combat inadvertent movement and illicit trafficking of radioactive materials”.

1.1.2. Illicit trafficking

The IAEA glossary definition at the time of writing is: “Illicit trafficking is the receipt, possession, use, transfer or disposal of radioactive material without authorization”. This definition is much broader than the term as it is generally understood by police, customs and other law enforcement bodies. In view of this, and the diverse professional interest of the co-sponsors of this TECDOC, it is important to provide some amplification of the term illicit trafficking to ensure its correct application.

In the context of this TECDOC, the term should not be interpreted as covering all unauthorized events involving radioactive materials, irrespective of type and cause, since most of these may only be administrative offences and matters for the national nuclear or radiological regulatory authority, rather than for law enforcement.

The interests of the co-sponsoring organizations all include criminal activities (such as breaches of national and international law) and it is this dimension that underlies the purpose of this definition, this TECDOC and its companions [1, 2].

Criminal activities under consideration include:

- ∞ # subversive activities, such as breaches of proliferation controls (as they are subversive to international will);
- ∞ # other actual or potential malevolent acts intended to cause harm to people or the environment;
- ∞ # illegal gain, such as profits from the sale of the radioactive material;
- ∞ # avoiding prescribed costs of disposal, or relevant taxes;
- ∞ # violation of transport regulations.

Experience of some Member States has shown that many cases where radioactive materials have been shown to have been moved illegally across international borders have been due to “inadvertent” movements, rather than those with true criminal intent. An example of this is when radioactive materials have been moved across international borders mixed with scrap metal [3, 4]. For this reason, instances where loss of control has occurred unintentionally, and the material is then found in another country can be usefully included in the discussion. In reality, it is only after such cases have been discovered and investigated can they be

distinguished from cases with clear criminal intent. The problems of radiation safety, and harm to people, property and the environment are identical in both categories of incident.

To summarize, this TECDOC uses the term “illicit trafficking” to mean any intentional unauthorized movement or trade (particularly international) of radioactive materials (including nuclear materials) with criminal intent. This use of the term is consistent with that used by police, customs and other law enforcement bodies involved in combating trafficking in firearms, people, motor vehicles and drugs.

1.2. Background

It should be noted that since nuclear materials are also radioactive, in this publication the term “radioactive materials” includes nuclear materials. “Radioactive materials” is used simply to avoid repetitious use of the phrase “nuclear, and other radioactive materials”. It is recognized that nuclear materials will be of prime interest from an illicit trafficking viewpoint.

Radioactive materials are used throughout the world for a wide variety of beneficial purposes, in industry, medicine, research, defence and education. The radiological risks associated with such use need to be restricted and protected against by the application of appropriate radiation safety standards.

The International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS) [5] are designed to meet the objectives and apply the principles that are presented in the IAEA Safety Fundamentals publication “Radiation Protection and the Safety of Radiation Sources” [6]. These standards, jointly sponsored by the IAEA and five other international organizations, establish basic requirements for protection against the risks associated with exposure to ionizing radiation and for the safety of radiation sources that may deliver such exposure. They provide the basis for national regulations and operational safety. The BSS are based on the presumption that a national infrastructure is in place enabling the Government to discharge its responsibilities for protection and safety. A further Safety Requirements publication, “Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety” [7], provides the basic requirements for this and is usefully read in conjunction with the BSS. Additional material is to be found in an IAEA Technical Document, “Organization and Implementation of a National Regulatory Infrastructure Governing Protection Against Ionizing Radiation and the Safety of Radiation Sources” [8]. Finally, the Code of Conduct on the Safety and Security of Radioactive Sources [9] provides comprehensive lists of good practices for States and their regulatory bodies.

National regulatory systems consistent with the IAEA guidance described above would be expected to ensure that effective control of radioactive materials is maintained. This is particularly true for all States that have implemented the Code of Conduct [9]. Nevertheless, control can be lost for a variety of reasons. For example, a user of radioactive materials may not follow the procedures required by regulations. Loss of control can also result from deficiencies in the infrastructure itself or from inadequate physical security. In addition to negligence, there may also be deliberate diversion of radioactive materials. This can be to avoid the costs of waste disposal or in the belief that the materials have value, as a commercial or military commodity. Terrorists may also attempt to acquire radioactive materials. Because of the issues associated with the proliferation of nuclear weapons, and terrorism there is a particular concern in this regard with materials that are used in nuclear power and nuclear weapons programmes.

There have been instances in which loss of control over radioactive materials has led to serious, even fatal, consequences to persons. Examples include unintentional incorporation of radioactive materials into recycled steel [10, 11]; recovery of lost radioactive sources by unsuspecting individuals [12]; and theft of radioactive material [13]. A number of cases have been reported in which radioactive materials have been moved across international borders mixed with scrap metal [3, 4].

In addition to the potentially significant radiological risk, these actions can lead to considerable financial expenditure for decontamination and substantial monetary loss from the shutdown of contaminated plant. In some Member States these costs can be compounded by very high disposal costs for wastes arising from such incidents.

Because of the possibility of transfer across borders, regaining control of radioactive materials at the point of entry to the country, or other checkpoints prevents escalation of problems later, when the consequences may be much greater.

A number of measures may be taken by the relevant authorities within Member States to maximize the probability of regaining control of such radioactive materials. A document entitled “Methods to Identify and Locate Spent Radiation Sources” [14] provides some guidance in this regard. This is complementary to the current TECDOC, which describes one of the measures used at borders, which is the effective co-operation of national regulatory authorities and customs, police and other law enforcement bodies.

1.3. Scope

This publication outlines the supporting infrastructure concerned with the control of radioactive materials of all types, including radioactive sources, radioactive wastes and nuclear materials, in order to prevent them being involved in inadvertent movement or illicit trafficking. In particular, it explains the contribution that may be made by customs, police and other law enforcement bodies towards solving this problem.

This TECDOC has neither the aim nor intention of interfering with the regulation or practice of customs or other law enforcement agencies. It is intended to support their countermeasures against inadvertent movement and illicit trafficking of radioactive materials.

1.4. Objective

The purpose of this publication is to provide information to customs, police and other law enforcement bodies on the arrangements for effectively preventing inadvertent movements and illicit trafficking, and the role that they might play in this. It is likely also to be of interest to the national regulatory authority¹, and others with related concerns.

¹ In this publication, a single regulatory authority is referred to but this does not preclude there being more than one.

2. FRAMEWORK FOR PREVENTING INADVERTENT MOVEMENT AND ILLICIT TRAFFICKING

2.1. Background

This section describes the main elements within a national infrastructure in the areas of radiation protection, nuclear safety and waste management for preventing the inadvertent movement and illicit trafficking of radioactive materials. Its purpose is to provide an overview of the issues involved as well as the roles and responsibilities of the national bodies participating in efforts to prevent inadvertent movement and illicit trafficking. The target audience is customs, police and other law enforcement officers.

It should be noted with respect to nuclear materials, that in addition to the radiological and safety considerations there is a further set of requirements imposed because of the non-proliferation aspects of the material. In each State where nuclear material is authorized for use, storage or transport, a State will have established a system of accounting and control of that material. Within this system it is the responsibility of the operator to account for all the material possessed in accordance with the requirements for taking physical inventories established by the regulatory authority. This information is then submitted to the competent authority by the facility operator. The State ensures that the operator is fulfilling this responsibility and the IAEA verifies the accounting in accordance with established agreements.

2.2. International issues

The *Convention on the Physical Protection of Nuclear Material* [15] applies to nuclear material used for peaceful purposes while in international nuclear transport. The Convention specifies the international co-operation and co-ordination by which the transport of nuclear material is made. Although the levels of physical protection prescribed in the Convention are required to be applied only to nuclear material used for peaceful purposes while in international nuclear transport, other provisions of the Convention apply also to nuclear material while in domestic use, storage and transport. For example, there are requirements that relate to making specified acts criminal offences under national law, to establishing jurisdiction over those offences and to prosecuting or extraditing alleged offenders.

INFCIRC/225/Rev.4 (Corrected), *The Physical Protection of Nuclear Material and Nuclear Facilities* [16], has been widely accepted as an international standard for physical protection and is referred to in export control regimes and in supply agreements. These international consensus recommendations are widely accepted and provide a basis for States to specify requirements for the protection of nuclear material in transport, use and storage as well as for the protection of nuclear facilities against sabotage. While they are voluntary recommendations for States, they receive a legal status in some situations by virtue of their adoption in State regulatory frameworks and by reference within other regimes, such as in the Nuclear Suppliers Guidelines [17].

This separate regime is not discussed further in this publication.

2.3. National legislation

For a firm foundation on which to build an effective approach to combating the inadvertent movement and illicit trafficking of radioactive materials a regulatory authority would be

expected to be established under national legislation, and to be empowered, with respect to radioactive materials (including nuclear materials) to:

- ∞ # develop regulations and issue guidance;
- ∞ # issue, amend, suspend or revoke authorizations for practices involving radioactive and nuclear materials such as the receipt, possession, import, export, use, transfer and disposal;
- ∞ # enter sites and facilities to conduct inspections;
- ∞ # enforce regulatory requirements; and
- ∞ # develop the capability to take actions leading to the recovery of control over radioactive materials in the event of loss, diversion, theft, or unauthorized possession.

If these tasks are assigned to more than one authority, comprehensive exchange of information and effective co-ordination between them is necessary.

2.4. Administrative requirements

2.4.1. General

Regulatory requirements in Member States should follow the scheme for protection of radioactive materials given in the International Basic Safety Standards (BSS) [5] and for control of nuclear materials in the Treaty on the Non-Proliferation of Nuclear Weapons. The BSS specify that regulatory authorities should be notified of any practices involving radioactive materials and appropriate authorization obtained unless the exposure from the practice has been *excluded* or the practice has been *exempted* from following the requirements of the BSS. Important administrative requirements in relation to the prevention of inadvertent movement and illicit trafficking therefore are those concerning notification of, and authorization for, the possession, storage, transfer and disposal of radioactive materials. The regulations should therefore specify, as appropriate, that possession, storage, transfer and disposal of radioactive materials are legitimate only if the regulatory authority has been notified and any necessary authorization by way of *registration* or *licensing* has been obtained². The registration or licensing would then impose certain conditions regarding the material including how it should be controlled.

The regulatory authority should be expected to have an enforcement policy to correct non-compliance with these regulatory requirements. This enforcement policy will specify the penalties for non-compliance since these provide strong incentives on the part of legal persons to prevent loss of the radioactive materials for which they are responsible.

Authorization by registration or licensing necessitates that the applicant submit a detailed demonstration of safety and security which is reviewed and assessed by the regulatory authority in accordance with clearly defined procedures. The extent of control that is required to be applied would be expected to be matched to the potential magnitude and nature of the hazard presented. For the purposes of preventing the inadvertent movement and illicit trafficking of radioactive materials, there is little distinction between registration and

² Some Member States have these terms in their legislation and regulations but with meanings that differ from those in the BSS [3]. For example, in some Member States the term ‘registration’ has been applied in authorizing the use of radioactive materials and ‘licensing’ is reserved for authorizing the operation of nuclear fuel cycle facilities and nuclear power plants.

licensing. Both require that authorization be obtained before possession, storage, transfer or disposal of the radioactive material.

An application for authorization normally includes information that is relevant to preventing and responding to inadvertent movement and illicit trafficking, namely:

- ∞ # information on the types of radioactive materials and quantities that will be involved;
- ∞ # a technical description of any equipment in which the radioactive materials are used;
- ∞ # information on the type of the practice, the location of use and the nature and location of the storage facilities; and
- ∞ # the identities of the individuals responsible for the security and safety of the radioactive materials.

Accounting records are required to be maintained by those authorized to receive, possess, transfer, store and dispose of radioactive materials. These include records of shipments, receipts, physical inventory, and transfer, or export to other users or for disposal. Data would cover material type, activity, chemical and physical form, and any associated equipment as applicable. Records of notifications and authorizations and supporting information would also normally be maintained by the regulatory authority. Information on loss or theft of radioactive materials would be included in records that are kept to assist investigations.

Radioactive materials in second-hand equipment such as that from medical clinics and some industrial users are particularly vulnerable to inadvertent movement or illicit trafficking. The regulatory authority should be alert to this possibility and should provide appropriate information to authorized users of such equipment so that they are familiar with the regulatory requirements for transport, export or transfer of ownership of radioactive materials.

2.4.2. Transport

The transport of radioactive materials is normally subject to the requirements of the IAEA's Regulations for the Safe Transport of Radioactive Material [18]. These Regulations specify, among other things, requirements for packaging, labelling and documentation, as well as the timing and nature of notifications by the consignor or producer. The intention is that transport carriers are alerted to the nature of the contents of packages and can take appropriate precautions with them. Any observed deficiencies in meeting the requirements may be used by law enforcement officers as an indicator of the possibility of inadvertent movement or illicit trafficking.

2.4.3. Import

The regulatory authority of some States whose authorized legal persons import radioactive materials enter into agreements with suppliers to ensure that the authority is notified of intended shipments of radioactive materials that are being imported from suppliers. However, this is by no means universal.

2.4.4. Export

Arrangements vary between States. The regulatory authority of a country whose authorized legal persons export radioactive materials could require the suppliers not to transfer such materials unless the receiver has a valid authorization. In addition, the regulatory authority might require suppliers to notify regulatory authorities in importing countries of radioactive

materials sent to their respective countries. This could also apply to radioactive materials in transit. Again, however, there is currently no international agreement on these provisions.

2.4.5. *Commercial distribution*

Most individual shipments of radioactive materials are of relatively low activity. These shipments are most likely intended for distribution to medical, industrial or research users. Packages are usually small and are often transported with other cargo. To reduce the vulnerability of such shipments to loss of control, consignors are required to provide transport documents [18]. The regulatory authority's transport regulations also require carriers to promptly report missing packages and transport accidents involving radioactive materials. When a consignment is undeliverable the consignment must be placed in a safe location and the competent authority informed. Similar arrangements apply to leaking or damaged packages.

2.4.6. *Storage and disposal*

Radioactive materials that are no longer in use may be disposed of via several routes including being returned to the supplier following authorized procedures. Because of the problems associated with orphan sources, there is significant value to agreements that involve the prompt return of disused sources. Some national regulations require such agreements to be signed prior to the issuance of an authorization to obtain the radioactive source.

If return to the supplier is not possible, it is best if the materials are collected and, if appropriate, conditioned for storage until such time as transfer can be made to an authorized disposal facility. The secure storage and safe disposal of radioactive materials no longer in use, and for which no further use is foreseen, is a key aspect of ensuring that security and control are not lost. This is particularly important because responsible individuals move or they are replaced and corporate memory is lost. The regulatory authority is expected to perform inspections to ensure that users have properly disposed of or stored those radioactive materials deemed to be waste.

2.4.7. *Financial implications*

A comprehensive preventive effort would include consideration of the fiscal implications associated with approved disposal, clean-up, and return of radioactive materials arising from incidents of inadvertent movement or illicit trafficking. However, the responsibilities for such costs are ill-defined in many States.

2.5. Security of radioactive materials

The BSS [5] require that “Sources shall be kept secure so as to prevent theft or damage and to prevent any unauthorized legal person from carrying out any of the actions specified...”. It goes on to include statements regarding the need for complying with registration or license requirements, to conduct inventories and to report if sources missing.

2.5.1. *Level of security*

The regulatory authority specifies, through its regulations, the type and level of security it requires for the management of nuclear and other radioactive materials. In most cases the level

of security is higher for the more significant sources. The IAEA's Categorization of Radiation Sources [19] is useful in this regard.

2.5.2. Periodic inventory requirements

Inventories of radioactive materials should be performed periodically by the legal person to confirm that the materials are in their assigned locations and are secure [5]. If sources or devices have a higher degree of risk, or are frequently moved or transported, the regulatory authority would require more frequent inventories to be made.

2.5.3. Notification of loss of control or theft, and seizures

The regulatory authority should be notified of the loss of control over radioactive materials due to loss or theft, and also of seizures. It is advisable that customs, police and other law enforcement bodies have a procedure to forward seizure information through their established communication channels to identified authorities. The notification would typically include a description of the radioactive material and any associated equipment, as well as its last known location and the circumstances associated with the loss or theft. The initial notification needs to be prompt in order to ensure an appropriate response.

2.5.4. Compliance monitoring

The key elements of compliance monitoring, related to the inadvertent movement and illicit trafficking of radioactive materials, are requirements for:

- ∞ # on-site inspection, particularly the examination of records to ensure that radioactive materials are maintained as authorized;
- ∞ # verification that losses, potential losses of control, or theft are reported; and
- ∞ # periodic feedback from users on the status of radioactive materials,

2.5.5. Physical control

The physical controls placed on radioactive materials that are being used, stored or transported are normally commensurate with the activity and properties of the materials [19]. Examples of such controls are:

- ∞ # a clearly designated and exclusive place for handling and storage;
- ∞ # notices, signals or other warning means to indicate the presence of radioactive material;
- ∞ # indication of reference levels of radiation dose rates and contamination at appropriate locations; and
- ∞ # physical barriers, including:
 - # controlled access to the place of use or storage; and
 - # guards or electronic surveillance, locks, sealing procedures or other means to ensure that the area is physically secure.

Regular audits and assessments of the physical controls are conducted by those responsible for radioactive materials to verify that the notices and barriers continue to provide an acceptable level of security and safety.

The regulatory authority can be expected to ensure that the legal person for any such facility has established written procedures that individuals with responsibility for handling radioactive materials must follow. Mobile radioactive sources, such as those used in industrial radiography or portable gauges, are particularly vulnerable to loss of control or theft. For such sources, secure temporary storage at remote locations is best.

2.5.6. Summary

The above description of regulatory and administrative arrangements, which can be expected to be found in a State following IAEA standards and guidelines, is intended to demonstrate that the infrastructure systems in place would normally prevent inadvertent movement and illicit trafficking of radioactive materials. However, experience has shown that occasionally even these comprehensive arrangements are not sufficient. In addition, not all States have yet implemented such a rigorous level of control as those advocated in the Code of Conduct [9].

Increasingly, Member States have adopted a co-operative approach between regulatory authorities, customs, police and other law enforcement bodies to augment their traditional infrastructure. These stakeholders are encouraged to further develop their co-ordination efforts in dealing with imports, exports, transport, commercial distribution, storage and disposal of radioactive materials. In particular, customs, police and other law enforcement bodies are advised to notify the regulatory body of any non-compliance with national legislation that they become aware of, or suspect. Equally, the regulatory authority should not underestimate the value of the information that can be provided by customs, police and other law enforcement bodies in preventing inadvertent movements and illicit trafficking of radioactive materials. This is discussed further in the next section.

3. ROLE OF CUSTOMS, POLICE AND OTHER LAW ENFORCEMENT BODIES

3.1. General

Regulatory and other appropriate law enforcement bodies are advised to co-operate and regularly exchange information as part of strengthening their capabilities for increasing security and preventing a loss of control over radioactive materials. It is recommended that this be done both domestically and internationally, and that advantage is taken of the current co-operative initiatives by the IAEA, the World Customs Organization (WCO), the International Criminal Police Organization (INTERPOL) and the European Commission. These initiatives are aimed at strengthening the infrastructures of Member States and the international agencies, at increasing competence and vigilance, and at avoiding duplication. This section recommends in general terms how improved co-operation and communications can be developed within Member States and between Member States.

3.2. The national level

It is recommended that a national programme on the prevention of inadvertent movement and illicit trafficking includes all competent national agencies with related responsibilities. This is most effective when it covers the nuclear safety and radiation protection authorities, all law enforcement agencies and customs services.

For efficient co-operation and communication, the national regulatory authority, customs, police and other law enforcement officers are advised to:

- ∞ # establish a network of contact points as part of an overall co-ordination and control mechanism;
- ∞ # encourage co-operative intelligence and similar efforts by customs and law enforcement officers to prevent the uncontrolled movement and trade in smuggled radioactive materials;
- ∞ # encourage the exchange of information between agencies, authorities and services concerning inadvertent movement, illicit trafficking and loss of control over radioactive materials;
- ∞ # establish a reliable, extensive and continuously updated database on cases of inadvertent movement or illicit trafficking, using a common reporting protocol; and
- ∞ # adopt a common notification and reporting format.

3.2.1. Raising public awareness

Raising public awareness is an important part of prevention at the national level. The national regulatory authority, customs, police and other law enforcement bodies are encouraged to participate in the development and establishment of an effective public awareness raising programme.

The form of this programme needs to be in line with the national regulations and so will vary between States. It may include: information on changes of law, advertising campaigns directed towards target groups such as metal recycling industries or news items on successful prevention cases.

3.2.2. Training

The national regulatory authority, customs, police and other law enforcement bodies are advised to co-operate in the development of training materials and the conduct of training courses. Training needs to have clear and concise objectives. Member States may consider utilizing material that has been produced by IAEA, WCO, EUROPOL and INTERPOL.

It is recommended that any training material or course to be delivered on the prevention of inadvertent movement or illicit trafficking of radioactive materials should also cover the detection of, and response to inadvertent movement and illicit trafficking.

3.2.3. Detection equipment

Member States may wish to assess their needs for detection equipment that may contribute to their prevention measures against inadvertent movement and illicit trafficking of radioactive materials.

It is recommended that any training material or course to be delivered on the prevention of inadvertent movement or illicit trafficking of radioactive materials should also cover the detection of [1], and response to [2] inadvertent movement and illicit trafficking.

3.3. The bilateral and regional level

National regulatory and other authorities are advised to consider formally co-operating and exchanging information with the appropriate national authorities in neighbouring countries and with countries that have been identified as possible sources of seized radioactive

materials. This initiative will foster bilateral, regional and international co-operation and communication concerning the inadvertent movement and illicit trafficking of radioactive materials as well as creating opportunities to review existing control mechanisms.

3.4. The international level

National authorities are encouraged to take advantage of the assistance available from international organizations in establishing contact points for sharing information and expertise, for organizing and participating in technical meetings and for supporting national programmes.

National authorities are requested to inform the appropriate international organizations about cases of inadvertent movement, illicit trafficking or seizures of radioactive materials, in accordance with their national legislation and channels of communication. In particular, it is helpful if events can be reported to the IAEA [20], WCO, EUROPOL and INTERPOL for inclusion in their databases on nuclear and other radioactive materials.

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GLOSSARY

The following definitions apply for the purposes of the present publication:

Control of radioactive materials

The act of maintaining cognizant supervision by proper authorities over the production, use, storage, transport and disposal of radioactive materials.

Exclusion

Any exposure whose magnitude or likelihood is essentially not amenable to control through the requirements of the Standards is deemed to be excluded from the provisions of the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources.

Exemption

Practices and sources within practices may be exempted from the provisions of the Basic Safety Standards by Regulatory Authorities, based on criteria derived from the general principles that: (a) the radiation risks to individuals, caused by the exempted practice or source be sufficiently low as to be of no regulatory concern; (b) the collective radiological impact of the exempted practice or source be sufficiently low as not to warrant regulatory control under the prevailing circumstances; and (c) the exempted practices and sources be inherently safe, with no appreciable likelihood of scenarios that lead to a failure to meet the criteria in (a) and (b).

Illicit trafficking

Any intentional unauthorized movement or trade (particularly international) of radioactive materials (including nuclear materials) with criminal intent.

Inadvertent movement

Any unintentional unauthorized receipt, possession, use or transfer of radioactive, including nuclear, materials.

Infrastructure

The basic organization, legal systems, technical resources, management and related factors that are put in place by a national authority to protect against ionization radiation and to ensure the safety of radioactive materials in their production, use, transport and disposal.

Monitoring

The measurement of dose or contamination for reasons related to the assessment or control of exposure to radiation or radioactive substances, and the interpretation of the results.

Non-proliferation

A broad term used in international agreements in relation to limiting the availability of nuclear material and thus reducing the capability for production of nuclear weapons.

Nuclear material

Plutonium except that with isotopic concentration exceeding 80% in plutonium-238; uranium-233; uranium enriched in the isotope 235 or 233; uranium containing the mixture of isotopes as occurring in nature other than in the form of ore or ore-residue; any material containing one or more of the foregoing.

Orphan source

A source which poses sufficient radiological hazard to warrant regulatory control, but which is not under regulatory control because it has never been so, or because it has been abandoned, lost, misplaced, stolen or otherwise transferred without proper authorization.

Physical protection

Measures for the protection of nuclear material or authorized facilities designed to prevent unauthorized access or removal of fissile material or sabotage with regard to safeguards, as, for example, in the Convention on the Physical Protection of Nuclear Material.

Radioactive materials

Material designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity.

Radioactive waste

Material, whatever its physical form, remaining from practices or interventions and for which no further use is foreseen (i) that contains or is contaminated with radioactive substances and has an activity or activity concentration higher than the level from regulatory requirements, and (ii) exposure to which is not excluded from the Standards.

Regulatory authority

An authority or authorities designated or otherwise recognized by a government for regulatory purposes in connection with protection and safety. A single regulatory authority is referred to in this publication but this does not exclude there being more than one.

Safeguards

A verification system within the framework of international non-proliferation policy, applied to the peaceful uses of nuclear energy and intended to maintain stringent control over nuclear material.

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