

IAEA Nuclear Security Series No. 37-G

Implementing Guide

**Developing a National
Framework for
Managing the Response to
Nuclear Security Events**



IAEA

International Atomic Energy Agency

IAEA NUCLEAR SECURITY SERIES

Nuclear security issues relating to the prevention and detection of, and response to, criminal or intentional unauthorized acts involving, or directed at, nuclear material, other radioactive material, associated facilities or associated activities are addressed in the **IAEA Nuclear Security Series**. These publications are consistent with, and complement, international nuclear security instruments, such as the Convention on the Physical Protection of Nuclear Material and its Amendment, the International Convention for the Suppression of Acts of Nuclear Terrorism, United Nations Security Council resolutions 1373 and 1540, and the Code of Conduct on the Safety and Security of Radioactive Sources.

CATEGORIES IN THE IAEA NUCLEAR SECURITY SERIES

Publications in the IAEA Nuclear Security Series are issued in the following categories:

- **Nuclear Security Fundamentals** specify the objective of a State's nuclear security regime and the essential elements of such a regime. They provide the basis for the Nuclear Security Recommendations.
- **Nuclear Security Recommendations** set out measures that States should take to achieve and maintain an effective national nuclear security regime consistent with the Nuclear Security Fundamentals.
- **Implementing Guides** provide guidance on the means by which States could implement the measures set out in the Nuclear Security Recommendations. As such, they focus on how to meet the recommendations relating to broad areas of nuclear security.
- **Technical Guidance** provides guidance on specific technical subjects to supplement the guidance set out in the Implementing Guides. They focus on details of how to implement the necessary measures.

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For each publication, the Secretariat prepares the following, which the NSGC approves at successive stages in the preparation and review process:

- An outline and work plan describing the intended new or revised publication, its intended purpose, scope and content;
- A draft publication for submission to Member States for comment during the 120 day consultation period;
- A final draft publication taking account of Member States' comments.

The process for drafting and reviewing publications in the IAEA Nuclear Security Series takes account of confidentiality considerations and recognizes that nuclear security is inseparably linked with general and specific national security concerns.

An underlying consideration is that related IAEA safety standards and safeguards activities should be taken into account in the technical content of the publications. In particular, Nuclear Security Series publications addressing areas in which there are interfaces with safety — known as interface documents — are reviewed at each of the stages set out above by relevant Safety Standards Committees as well as by the NSGC.

DEVELOPING A NATIONAL
FRAMEWORK FOR MANAGING
THE RESPONSE TO NUCLEAR
SECURITY EVENTS

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The Agency's Statute was approved on 23 October 1956 by the Conference on the Statute of the IAEA held at United Nations Headquarters, New York; it entered into force on 29 July 1957. The Headquarters of the Agency are situated in Vienna. Its principal objective is "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world".

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IMPLEMENTING GUIDE

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2019

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FOREWORD

The IAEA's principal objective under its Statute is "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world." Our work involves both preventing the spread of nuclear weapons and ensuring that nuclear technology is made available for peaceful purposes in areas such as health and agriculture. It is essential that all nuclear and other radioactive materials, and the facilities at which they are held, are managed in a safe manner and properly protected against criminal or intentional unauthorized acts.

Nuclear security is the responsibility of each individual State, but international cooperation is vital to support States in establishing and maintaining effective nuclear security regimes. The central role of the IAEA in facilitating such cooperation and providing assistance to States is well recognized. The IAEA's role reflects its broad membership, its mandate, its unique expertise and its long experience of providing technical assistance and specialist, practical guidance to States.

Since 2006, the IAEA has issued Nuclear Security Series publications to help States to establish effective national nuclear security regimes. These publications complement international legal instruments on nuclear security, such as the Convention on the Physical Protection of Nuclear Material and its Amendment, the International Convention for the Suppression of Acts of Nuclear Terrorism, United Nations Security Council resolutions 1373 and 1540, and the Code of Conduct on the Safety and Security of Radioactive Sources.

Guidance is developed with the active involvement of experts from IAEA Member States, which ensures that it reflects a consensus on good practices in nuclear security. The IAEA Nuclear Security Guidance Committee, established in March 2012 and made up of Member States' representatives, reviews and approves draft publications in the Nuclear Security Series as they are developed.

The IAEA will continue to work with its Member States to ensure that the benefits of peaceful nuclear technology are made available to improve the health, well-being and prosperity of people worldwide.

EDITORIAL NOTE

Guidance issued in the IAEA Nuclear Security Series is not binding on States, but States may use the guidance to assist them in meeting their obligations under international legal instruments and in discharging their responsibility for nuclear security within the State. Guidance expressed as 'should' statements is intended to present international good practices and to indicate an international consensus that it is necessary for States to take the measures recommended or equivalent alternative measures.

Security related terms are to be understood as defined in the publication in which they appear, or in the higher level guidance that the publication supports. Otherwise, words are used with their commonly understood meanings.

An appendix is considered to form an integral part of the publication. Material in an appendix has the same status as the body text. Annexes are used to provide practical examples or additional information or explanation. Annexes are not integral parts of the main text.

Although great care has been taken to maintain the accuracy of information contained in this publication, neither the IAEA nor its Member States assume any responsibility for consequences which may arise from its use.

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1. INTRODUCTION

BACKGROUND

1.1. Nuclear security events may be very complex and are likely to have national and international implications that need to be addressed by the State or States affected. The nature and magnitude of such events may initially be unclear, and the State needs to be prepared in order to clarify the situation and respond appropriately, whether or not the nuclear security event leads to a nuclear or radiological emergency. It is the State's responsibility to establish whether a criminal or intentional unauthorized act involving or directed at nuclear material, other radioactive material, an associated facility or an associated activity (hereinafter shortened to 'criminal or intentional unauthorized act') is taking place, and to provide an effective, coordinated response.

1.2. States need to ensure that their national capabilities to respond to a nuclear security event and any resulting emergency include a mechanism to rapidly assess and categorize the event based on factors such as the threat, potential human and environmental consequences, economic impact and nature of the nuclear or other radioactive material. The response to a nuclear security event should also support any subsequent legal proceedings associated with the event, including the apprehension and prosecution or extradition of alleged offenders.

1.3. To manage the response to a nuclear security event, it is recommended that a State establish a mechanism to coordinate the various activities undertaken by a range of competent authorities and associated entities [1, 2], including those relevant to response to a nuclear or radiological emergency.¹ A national framework for managing the response to a nuclear security event ('national framework') is an important part of the State's overall framework for response to all emergencies (see Fig. 1)², enabling the State to plan and prepare for such events.

1.4. The development of such a national framework creates a structure and a set of principles and agreements around which a State can frame its detection

¹ An integrated planning process for developing a national framework, including such a mechanism, for nuclear security events involving nuclear and other radioactive material out of regulatory control is described in Ref. [3].

² As indicated by the definitions in the Glossary included in this publication, and as illustrated in Fig. 1, the term 'emergency' refers generally to situations and events involving all types of hazard, whereas a 'nuclear or radiological emergency' is a specific type of emergency.

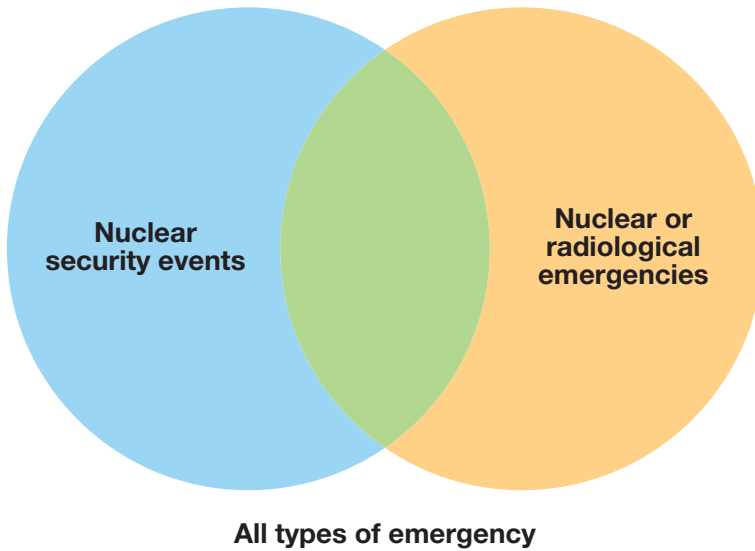


FIG. 1. Relationship between nuclear security events, nuclear or radiological emergencies and all types of emergency (simplified to exclude other specific types of emergency).

and response functions, which should be implemented through a detailed plan.³ Some response organizations might not be specifically trained or equipped to deal with nuclear or other radioactive material, relying instead on specialist agencies with which they may not routinely work and whose capabilities they may not fully understand. A national framework can address the interfaces and the potential interagency conflicts which may result from this lack of understanding by ensuring that the various response organizations have clearly defined and understood roles and responsibilities that are properly coordinated through the implementation of an effective multi-agency command, control and coordination structure.

1.5. A national framework benefits States by creating a single point of reference for all issues relating to the response to nuclear security events. When such an event leads to a nuclear or radiological emergency, the response should be integrated into the national emergency management system [4]. Such a framework can also encourage flexibility in a State's response to nuclear security events, by

³ This plan will be based on relevant legislation, the establishment of competent authorities and the development of nuclear security systems and measures for the prevention and detection of, and response to, nuclear security events [3].

enabling the State to respond on a scale appropriate to the event, through proper categorization of the different types of nuclear security event that it may face.

1.6. A national framework can ensure that a State considers all relevant factors when planning for response to nuclear security events, including national and international implications, public perceptions, and issues relating to the identification and safe and secure handling of nuclear or other radioactive material. Such a response is in the interests not only of the State directly affected, but of the wider international community as well, as nuclear security events can have significant effects beyond State borders.

1.7. When a nuclear security event has actual or potential consequences such that it is a nuclear or radiological emergency, the response to the nuclear security event should be integrated into the overall national emergency management system [4]. It is expected that this emergency response will provide suitable arrangements for integrated implementation of the necessary security response measures and protective actions and other actions in response to the nuclear or radiological emergency, while allowing the specific aspects relevant for security (e.g. interdiction, forensic and radiological crime scene management) to be properly addressed.

1.8. IAEA Nuclear Security Series No. 15, Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control [2], recommends that a State have a comprehensive national response plan for nuclear security events that is coordinated and consistent with, and where appropriate integrated with, other national plans, inter alia, the national nuclear or radiological emergency plan [4]. The national response plan for nuclear security events has the following roles:

- (a) It serves as a basis for establishing compatible operational tools (e.g. communications systems) needed for prompt and effective response.
- (b) It provides guidance for competent authorities to ensure that all necessary emergency preparedness and response tasks are given appropriate resources and support [2].

OBJECTIVE

1.9. The objective of this publication is to provide guidance to States on the development, implementation, maintenance and sustainment of a national framework. Such a national framework is intended to provide a basis for

developing and implementing the State's response to nuclear security events. As such, the guidance is intended to help States in establishing and sustaining an important component of an effective national nuclear security regime [1]. The guidance may also be of assistance to States in meeting their obligations under legal instruments relating to nuclear security, such as the Convention on the Physical Protection of Nuclear Material [5] and the International Convention for the Suppression of Acts of Nuclear Terrorism [6].

1.10. This publication is intended for national policy makers and decision makers, national and local competent authorities, facility operators, support organizations, and other entities and experts involved in developing a national framework.

SCOPE

1.11. This Implementing Guide addresses the development, implementation, maintenance and sustainment of a national framework. Such a national framework provides the basis for managing the response to such nuclear security events as recommended in Ref. [2] but does not constitute a response plan in itself.

1.12. This Implementing Guide may therefore assist States in developing an appropriate national response plan for nuclear security events; however, the details of such a plan are beyond its scope. The recommendations for measures that address the preparedness for, or response measures that are specific to, nuclear security events are provided in Refs [2, 7, 8].

1.13. The guidance in this publication is applicable to all nuclear security events, including those at regulated facilities using and/or storing nuclear and/or other radioactive material (nuclear facilities and other associated facilities) and those affecting associated activities, as well as those involving nuclear and other radioactive material out of regulatory control. It therefore supports and is consistent with the recommendations set out in the following publications:

- (a) Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5) [7];
- (b) Nuclear Security Recommendations on Radioactive Material and Associated Facilities [8];
- (c) Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control [2].

1.14. A State's nuclear security regime should include measures designed to prevent any nuclear security event from occurring, and to prevent nuclear material and other radioactive material from leaving regulatory control. However, such measures are outside the scope of this publication.

1.15. A major aim of the State should be to prevent the escalation of any nuclear security event it may face; for example, where radioactive material has not been released, the State should aim to prevent its release and to recover the material. This publication describes how to evaluate the resources needed by a State to prevent escalation by considering the likely consequences of various representative scenarios. It provides States with guidance on response actions and considerations that can be adapted to meet their specific circumstances, experience and priorities.

1.16. This publication does not address the response to any nuclear or radiological emergency that may result from a nuclear security event. However, coordination and integration between related authorities and relevant arrangements are crucial not only to managing the response to nuclear security events, but also to managing any associated nuclear or radiological emergency. As such, this publication complements and should be read in conjunction with IAEA publications on emergency response [9–20].

1.17. This publication does not set out predefined sets of actions for response to criminal or intentional unauthorized acts, such as those described in a facility operator's contingency plans [7] or security plan for radioactive material and associated facilities [8].

STRUCTURE

1.18. Section 2 describes the basis for a national framework, as well as the roles that threat assessment, the risk informed approach, the graded approach, and detection systems and measures play in planning and developing the national framework. Section 3 describes a way to evaluate the resources needed to prevent a nuclear security event from escalating by considering representative types of nuclear security event and their potential consequences. Section 4 addresses the design considerations relevant to a State's national framework, including the design methodology, strategic goals, functional outcomes and example response actions. Section 5 describes the infrastructure needed within a State's framework to enable it to effectively manage its response to nuclear security events. Section 6 describes international cooperation and assistance requirements

for responding to nuclear security events. Section 7 discusses the sustainability of a national framework.

2. BASIS FOR A NATIONAL FRAMEWORK FOR MANAGING THE RESPONSE TO NUCLEAR SECURITY EVENTS

OVERVIEW

2.1. Across the spectrum of nuclear security activities (Fig. 2), a State needs to manage activities undertaken by a range of competent authorities and associated entities, all of which need to be coordinated effectively. The need to develop an integrated plan for a coordinated response to a nuclear security event is of particular importance [3]. The development of a national framework is an important step in this planning process, ensuring that the State is prepared to deal with such events.

2.2. The agencies responsible for the response to criminal or intentional unauthorized acts typically have detailed plans for their response to such an act. However, in some States these plans are not shared with partner agencies, often on the grounds of information security. Wherever possible, information should be shared among agencies to the extent necessary for agency specific plans to adequately take into account their effect on partner agencies so that they do not hinder partner agencies in carrying out their own response functions.

2.3. The national framework discussed in this publication is designed to address interagency issues by promoting national practices that fully recognize the

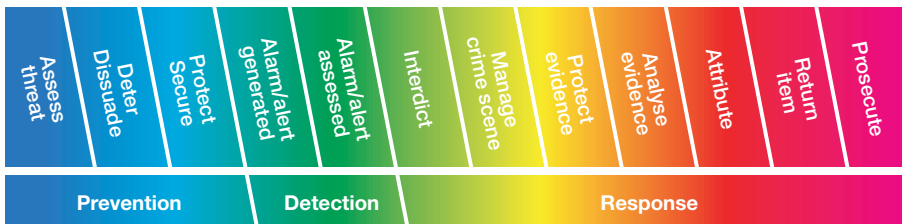


FIG. 2. Spectrum of nuclear security activities.

importance of interagency cooperation and coordination when planning for and responding to nuclear security events.

THREAT ASSESSMENT AND RISK INFORMED APPROACH

2.4. An effective national framework should provide for nuclear security systems and measures that are based on a State's identification of threats and targets; the State's assessment of risk (based on the assessment of identified threats, target vulnerabilities and potential consequences); and use of a risk informed approach to prioritize available resources, systems and measures to be developed and implemented [21].

2.5. Threat assessments consider the motivation, intentions and capabilities of potential adversaries; that is, those individuals or groups (nuclear security threats) that may attempt to commit a criminal or intentional unauthorized act.

2.6. A detailed list of examples of such acts is provided in Section 3, which also explains the relationship between nuclear security threats and types of nuclear security event. The threat assessment may take into account the technical feasibility of the use of nuclear or other radioactive material in a criminal or intentional unauthorized act, either within that State or elsewhere, as well as experience from previous nuclear security events.

2.7. A risk informed approach assists States in evaluating options and prioritizing nuclear security measures. It includes an iterative process of identifying and assessing risks; developing, evaluating and implementing options for reducing risks; and monitoring the effectiveness of the resulting systems. In applying a risk informed approach, a State should determine what level of risk is considered to be acceptable and what level of response actions will be needed to keep any residual consequences within acceptable bounds. This approach can be used to guide effective response efforts and mitigation activities to minimize the more serious reducible risks through an integrated plan. This process is illustrated in Fig. 3.

GRADED APPROACH

2.8. The application of a graded approach involves the design and use of security measures that are proportionate to the assessed risk from the identified threat arising from criminal or intentional unauthorized acts, particularly with regard

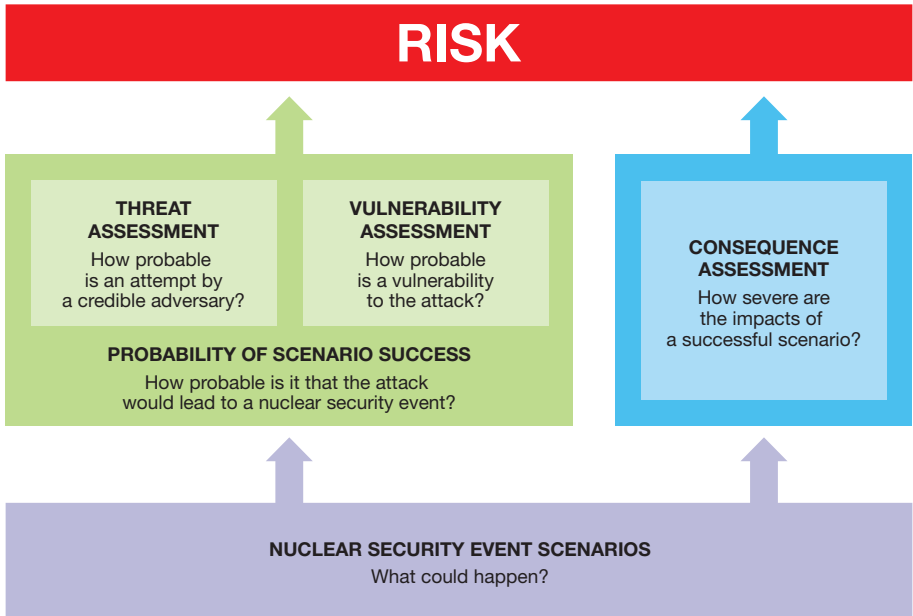


FIG. 3. Components of threat assessment and how they relate to each other.

to the anticipated consequences of a nuclear security event for persons, property, society and the environment. The application of a graded approach allows resources to be focused more effectively on the more serious reducible risks.

DETECTION SYSTEMS AND MEASURES

2.9. How a State identifies the nature of nuclear security events (other than those based purely on information alerts) will depend critically on its ability to detect and identify material and adversaries associated with such events. Physical protection alarms and material accounting system alerts in associated facilities and associated activities, as well as alarms or alerts derived from nuclear or other radioactive material out of regulatory control [21], can identify in a timely manner that a nuclear security event has occurred or is occurring, and the nature of that event. A State's detection systems and measures form a critical element of its infrastructure, defining the State's detection capabilities in accordance with available detection equipment and the practices, processes and procedures associated with its use [22–24]. A State's detection systems and measures for material out of regulatory control should have robust interfaces with its national framework [25].

3. TYPES OF NUCLEAR SECURITY EVENT AND PLANNING OF RESPONSE RESOURCES

GENERAL

3.1. To assist States in establishing response measures commensurate with their national threat and risk assessments, and in line with the principle of a graded approach, this publication includes guidance on evaluating the resources that would be needed by a State to prevent the escalation of a number of representative scenarios of nuclear security events. These representative scenarios have been grouped in three types as follows:

- (a) Type 1: A criminal or intentional unauthorized act leading to dispersal of nuclear or other radioactive material, harmful energy release from a nuclear reaction, or harmful exposure of people to radiation from nuclear or other radioactive material. This type of nuclear security event is always a nuclear or radiological emergency.
- (b) Type 2: A criminal or intentional unauthorized act in which there is the confirmed unauthorized presence at a known location of nuclear and/or other radioactive material, but without dispersal of the material, uncontrolled energy release from a nuclear reaction, or uncontrolled radiation exposure. This type of nuclear security event is likely to also be a nuclear or radiological emergency.
- (c) Type 3: Information alerts are assessed to indicate a credible possibility of a criminal or intentional unauthorized act, but the location of the nuclear or other radioactive material or sabotage⁴, or any planned target, might not be known. In some cases, this type of nuclear security event might also be a nuclear or radiological emergency.

3.2. In general, the potential consequences of the types of nuclear security event, and therefore the level of resources required to prevent escalation, increase as an event escalates from Type 3 toward Type 1. The potential consequences will depend on factors such as the nature of the criminal or intentional unauthorized act involved, the situation at the time the nuclear security event is detected and the nature of the nuclear or other radioactive material involved. In general, however, a release of radioactive material will increase the scale of the response by the State needed to mitigate the dispersal of that material or energy, and will also be

⁴ In examples of scenarios of types of nuclear security event within this guidance, the term 'sabotage' should be taken to include cyber-attack.

a nuclear or radiological emergency because of the associated risk to human life, health, property and the environment. At all times, the State's main aim should be to prevent any type of nuclear security event from escalating. However, if a Type 1 event occurs, initiating a nuclear or radiological emergency, or an escalation to Type 1 or 2 occurs, resulting in a nuclear or radiological emergency, the response may go beyond those actions surrounding the response to the nuclear security event (represented in Fig. 3). These additional actions are addressed in IAEA safety standards on emergency preparedness and response [4, 9, 20] and in supporting publications [12, 15–17, 19].

3.3. Additionally, to facilitate assessment of the type of nuclear security event, there is a need to distinguish between the progress or success of the adversary's execution of the attack and the State's ability to counteract the adversary's attempts. In the attempt to commit an attack, the adversary intends to have control of the device, the material and/or the intended exposure of the target. The State's intent is to counteract the adversary's attempts to attack.

TYPES OF NUCLEAR SECURITY EVENT

3.4. The three types of nuclear security event are described in more detail in the following paragraphs.

Type 1 nuclear security event

3.5. A Type 1 nuclear security event is a criminal or intentional unauthorized act in which there is dispersal of radioactive material, harmful energy release from a nuclear reaction or harmful radiation exposure of people. A Type 1 nuclear security event will always be a nuclear or radiological emergency.

3.6. For all but the most minor releases, such an emergency is likely to have severe consequences for persons, property, society and the environment and may call for the deployment of all available resources (local, national and international resources, depending on the State's capabilities). If such an emergency is detected or results from the escalation of a lower type of event, the State should take all reasonable measures to minimize its consequences.

3.7. Examples of scenarios representative of this type of nuclear security event include, but are not limited to, the following:

- (a) Sabotage of a nuclear facility or nuclear material resulting in a release of energy and/or dispersal of radioactive material.
- (b) Sabotage of an associated facility using or storing radioactive material or an associated activity (e.g. transport of radioactive material) resulting in dispersal of radioactive material.
- (c) Operation of a radiation exposure device (RED) or series of REDs, such as a high activity radioactive source, exposing people in its vicinity to radiation.
- (d) Operation of a radiological dispersal device (RDD) or series of RDDs resulting in dispersal of radioactive material by means of explosives or other means of dispersal (e.g. an aerosol generator, via a building ventilation system, manually).
- (e) Dispersal of nuclear material or energy release (and dispersal of radioactive material) from a detonation caused by a fission chain reaction in nuclear material.
- (f) Introduction of radioactive contamination at or into one of the following:
 - A strategic location, such as the venue of a major public event;
 - The food chain;
 - The water supply network;
 - Cosmetic, pharmaceutical or other products used by the public.

Type 2 nuclear security event

3.8. A Type 2 nuclear security event is a criminal or intentional unauthorized act in which there is the confirmed unauthorized presence of radioactive material, at a known location, but without dispersal of the material, uncontrolled energy release from a nuclear reaction or uncontrolled radiation exposure. A Type 2 nuclear security event is likely also to be a nuclear or radiological emergency.

3.9. Such scenarios could arise because an adversary has attempted a criminal or intentional unauthorized act that has been unsuccessful, or because an attempt to commit such an act is in progress. In the latter situation, the State's focus should be on preventing the successful completion of the act, thereby preventing escalation.

3.10. Such an event may call for the deployment of substantial resources (local and national resources and, in some cases, international resources, depending on the State's capabilities) in order to prevent escalation (e.g. to render safe an

RDD to prevent the release of radioactive material; to safely recover radioactive material from an RED before it is used to expose people). Where such an event is detected or results from escalation of a lower type of event, the State should seek to minimize its consequences and take all reasonable measures to prevent it from escalating to a Type 1 event.

3.11. Examples of scenarios representative of this type of nuclear security event include, but are not limited to, the following:

- (a) Attempted sabotage of a nuclear facility or nuclear material without uncontrolled energy release from a nuclear reaction or dispersal of radioactive material.
- (b) Attempted sabotage of an associated facility or associated activity (e.g. transport of radioactive material) without dispersal of radionuclides.
- (c) Attempted operation of an RED without uncontrolled radiation exposure of people to radioactive material.
- (d) Attempted operation of an RDD without dispersal of radioactive material.
- (e) Detection of nuclear material with the potential for an intentional or unintentional assembly that could create a detonation caused by a fission chain reaction.
- (f) Detection of radioactive material assessed to be intended for any of the following uses:
 - In an RED or RDD;
 - To cause radioactive contamination of a food chain, a water supply network, cosmetic or pharmaceutical products, or other products used by the public;
 - To cause radioactive contamination or irradiation of a targeted individual in such a way that the impact may be more widespread.
- (g) Detection of radioactive material out of regulatory control [25]:
 - At designated and undesignated points of entry and exit; or
 - Within a State's interior.

Type 3 nuclear security event

3.12. A Type 3 nuclear security event is a criminal or intentional unauthorized act in which information alerts alone are assessed to indicate a credible possibility of criminal or intentional unauthorized use of nuclear or other radioactive material or sabotage, but where the location of the nuclear or other radioactive material, or any planned target, may not be known. A Type 3 nuclear security event may also be a nuclear or radiological emergency.

3.13. In all cases, establishing the credibility of the information alert should be a priority for the State. A Type 3 nuclear security event may, in general, have moderate to significant consequences for persons, property, society and the environment, but if an information alert concerns, for example, the theft of high enriched uranium or a Category 1 source [24], or the attempted or successful intrusion into a nuclear facility, the Type 3 event could escalate to a higher category event with potential consequences that are much more severe. A Type 3 event will therefore call for the deployment of at least local resources in order to prevent escalation (e.g. to investigate reports of illicit trafficking, to provide a visible security presence to deter potential adversaries) but may also need the deployment of national and international resources, depending on the nature of the information and the State's capabilities. Where such an event is detected, the State should always seek to prevent it from escalating to a Type 2 or Type 1 event.

3.14. Examples of scenarios representative of this group of nuclear security events include, but are not limited to, the following:

- (a) Information indicating planned or attempted unauthorized removal of nuclear or other radioactive material;
- (b) The report of the theft or loss of or missing radioactive material, where the whereabouts of that material have not been established;
- (c) Information indicating planned or attempted sabotage of nuclear or other radioactive material or associated facilities and activities (e.g. transport of radioactive material);
- (d) Information that there is an RED, RDD or fission detonation device in a place where it could cause harm to persons, property, society or the environment and/or disruption;
- (e) Operational information from intelligence services, such as an illicit trafficking warning or information on a known adversary;
- (f) Information on regulatory non-compliance, such as missing material, discrepancies in accounting for nuclear material or in a register of radioactive material, or other unauthorized acts.

3.15. Figure 4 illustrates how a State might determine the scenario type for a nuclear security event. This algorithm should be reviewed regularly by the State as the response to a nuclear security event progresses to ensure that any change in the type of nuclear security event — either because the event has evolved or because more information has become available — can be quickly recognized and the response adjusted accordingly to prevent, where possible, further escalation of the event.

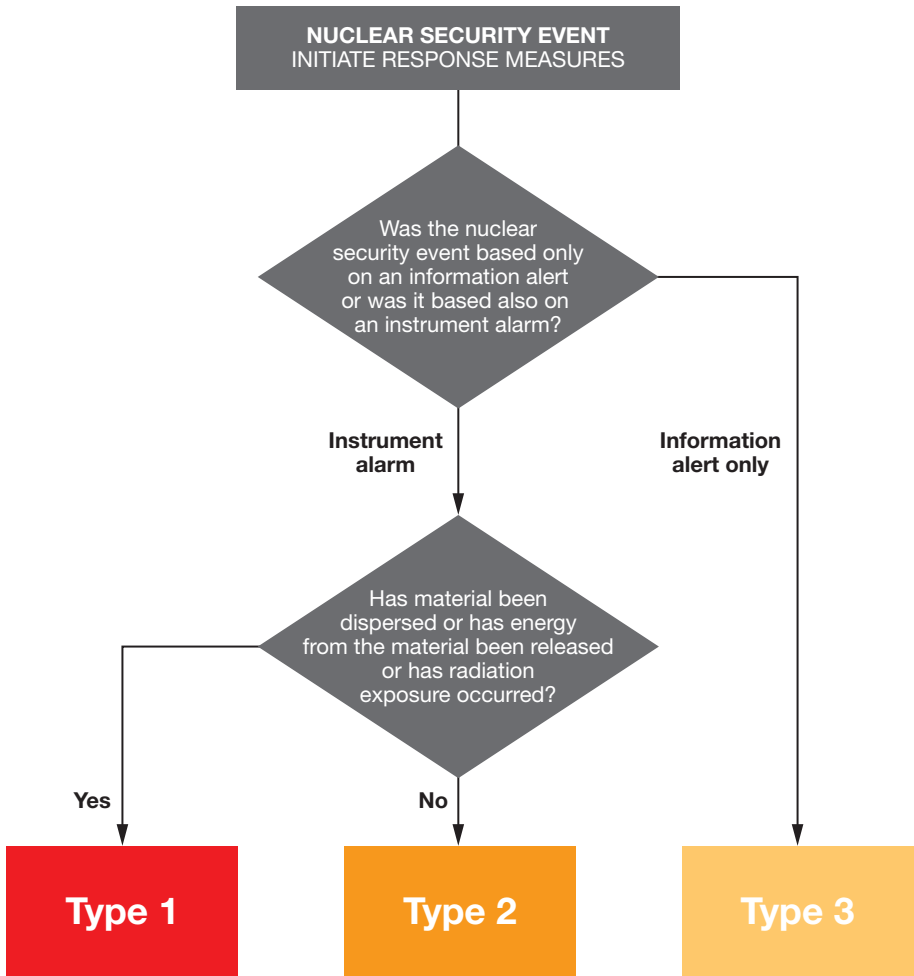


FIG. 4. Flowchart illustrating the process to determine the nuclear security event type.

RESOURCES

3.16. In general, the level of resources needed to respond to a nuclear security event will depend on the actual or potential consequences identified during assessment of the event. For Type 1 nuclear security events, which will always be nuclear or radiological emergencies, and for those Type 2 and Type 3 nuclear security events that are also nuclear or radiological emergencies, the response should follow the national emergency management system.

3.17. The assessment of the potential consequences of a nuclear security event provides a basis for a State to plan the resources needed to respond effectively to that event, using associated resource scales. The use of these resource scales may assist the State in determining (i) the potential resources required to deal effectively with the nuclear security event and (ii) whether the State itself can meet the scale of resources required for the event, or whether it may need to seek external assistance from other countries or from international organizations. While the scale of resources needed for response typically increases in proportion to the anticipated or potential consequences of an event, there may be exceptions, such as circumstances in which an event may require the deployment of international resources even if the potential consequences were initially categorized as minor. Examples of such circumstances include the following:

- (a) A case where a radiation detection instrument generates ambiguous results, leading the State to immediately request international reachback support to interpret the measurement;
- (b) A case where a very small amount of nuclear material that is detected and seized does not have immediate security implications and may be graded as minor, but where investigations reveal that the seized item is a sample of a larger quantity of material out of regulatory control that is available for use in a nuclear security event with international implications.

3.18. For most nuclear security events, the level of the resources needed for the response falls into one of three categories indicating the magnitude of resources necessary: local, national and international.

3.19. Guidance on planning the resources needed for response to a nuclear or radiological emergency, whether triggered by a nuclear security event or an accident, is provided in other IAEA publications [4, 12, 20].

Local resources

3.20. Local resources include security elements — such as law enforcement and military forces — and, where appropriate, emergency response elements — such as emergency medical services, civil protection services, and fire and rescue services — from which local personnel and equipment will be available to the State for the response to a nuclear security event at a given location. These local resources may be supported, where necessary, by specialist resources from the national level within the State to provide specific support and assistance, such as technical support to assist in the search for and identification and safe handling of nuclear or other radioactive material.

National resources

3.21. National resources are all resources available to a State for the response to a nuclear security event, including specialist scientific teams and other national response agencies. This level of resources involves the mobilization of all relevant response resources within the State in order to be able to deal with the nuclear security event.

International resources

3.22. International resources are the additional resources available to a State from responding agencies or specialist teams from other countries, or from international organizations such as the IAEA.

3.23. In most States, the initial response to any type of nuclear security event will be undertaken and managed by local resources. In many cases, local resources will be able to manage the response to a Type 3 event and in some cases to a Type 2 or Type 1 event (depending on the scale and nature of the event and the capabilities of the local resources). In some situations, however, local resources may need to be supported by national resources, for example, to provide technical support or assistance to safely search for or identify radioactive material. In some cases, international assistance may be needed by a State to effectively manage the response to a nuclear security event, such as support from specialist teams from other States or from international organizations such as the IAEA.

4. DESIGNING A NATIONAL FRAMEWORK FOR MANAGING THE RESPONSE TO NUCLEAR SECURITY EVENTS

4.1. An important step in designing an effective national framework is to secure the engagement of all stakeholders early in the process. The national framework should be designed with the involvement of all relevant competent authorities, responding agencies and other relevant organizations such as facility operators and should use the all hazards approach and be integrated into the national emergency management system.

4.2. One of the first steps in designing a national framework should therefore be to organize stakeholder meetings with all the organizations involved in the planning for, and response to, nuclear security events. Such meetings should involve senior representatives of all the competent authorities, responding agencies, government ministries and other institutions and organizations at the national level that have relevant roles and responsibilities, in order to ensure their agreement to integrate their existing resources and capabilities into the framework [3].

4.3. An effective way of engaging with stakeholders in designing a national framework is to run a series of workshops during which stakeholders are presented with a range of nuclear security event scenarios based on the State's national threat and risk assessment. Such scenario based workshops can be very effective, as they provide stakeholders with an agreed context in which to frame their discussions.

4.4. The design of a national framework should address the following key elements:

- (a) The types of nuclear security event that the State is likely to face (based on the national threat and risk assessment);
- (b) The State's strategic goals and priorities in responding to nuclear security events;
- (c) The functional outcomes underpinning those goals and priorities, and the response actions associated with those activities;
- (d) The competent authorities, facility operators and other agencies or organizations that will carry out those activities;
- (e) The roles and responsibilities of those organizations;
- (f) Single agency and multi-agency response plans and procedures;
- (g) The infrastructure that the State needs in order to respond effectively to nuclear security events;
- (h) The existing capabilities and any residual gaps.

Several of these elements will be discussed in more detail in the sections that follow.

STRATEGIC GOALS

4.5. A key element of a State's national framework is a statement of its strategic goals when managing such a response. These strategic goals, once agreed, should

drive all the activities by the State's competent authorities, facility operators and other responding agencies, ensuring a coherent multi-agency response in which all stakeholders work toward the same outcome.

4.6. Each State should determine its own strategic goals and their relative priority, taking account of its particular circumstances. It should be recognized that these strategic goals will often replicate those relating to resulting nuclear or radiological emergencies covered in separate guidance, and that nuclear security and nuclear safety have in common the aim of protecting persons, property, society and the environment. An example of a State's strategic goals for the response to nuclear security events is as follows:

- (a) Preserve life and protect people;
- (b) Mitigate and minimize the impact of the nuclear security event;
- (c) Inform the public and maintain public confidence;
- (d) Prevent, deter and detect criminal or intentional unauthorized acts;
- (e) Promote an early return to normality;
- (f) Ensure the health and safety of responders;
- (g) Protect the environment;
- (h) Facilitate legal proceedings and other forms of enquiry;
- (i) Review the response and identify lessons to be learned.

FUNCTIONAL OUTCOMES

4.7. Once a State has determined its strategic goals for managing its response to nuclear security events, it should then consider which functional outcomes will be needed to achieve those aims. These functional outcomes should be agreed between the State and responding agencies.

4.8. The functional outcomes play an important role within the national framework, setting out the measures that a State considers essential to enable its competent authorities and other responding agencies to respond effectively to nuclear security events. An example of the functional outcomes needed for a State to manage the law enforcement, intelligence and investigative response to nuclear security events is as follows:

- (a) Information gathering;
- (b) Information analysis;
- (c) Notification, activation and deployment;
- (d) Counteraction;

- (e) Criminal investigations;
- (f) Public information;
- (g) Mitigation of consequences.

It should be noted that these functional outcomes might not be sequential.

4.9. Each key activity for managing the response to nuclear security events should be underpinned by a detailed set of response actions. These actions provide the detail behind the functional outcomes and will often be broken down into single agency actions within a State's national response plan. Many single agency response plans will contain some of the functional outcomes and actions listed in Table 1, but by including them as part of its national framework, a State can ensure that they form part of the State's multi-agency response to nuclear security events.

4.10. Table 1 lists examples of functional outcomes that a State should consider when constructing its national framework for managing the response to nuclear security events, as well as associated response actions that might be included in each of those functional outcomes. States may choose to adopt these functional outcomes and response actions, or add to or amend them, as appropriate, to suit their particular circumstances.

ORGANIZATIONS, ROLES AND RESPONSIBILITIES

4.11. Once a State has identified its functional outcomes and response actions and agreed on them with stakeholders, it should clearly identify which specific agency or agencies at the local and national levels are responsible for each action. If the State does not have the local or national capability to undertake a particular action, it should consider seeking international assistance.

4.12. The clear allocation of roles and responsibilities to the organizations responsible for the response to nuclear security events is a key component of a national framework, reducing the risk of duplication of effort or omissions by organizations during the response. Understanding which organization is responsible for undertaking each response action enables planners to develop focused, effective response plans and decision makers, at all levels of command, to make better informed decisions, balancing priority actions with the resources available at any given time during the response.

TABLE 1. EXAMPLES OF FUNCTIONAL OUTCOMES AND ASSOCIATED RESPONSE ACTIONS

Functional outcome	Response actions
Information gathering	<ul style="list-style-type: none"> Collect information on alarms and alerts. Collect information about material, adversary and/or target. Confirm status of event (e.g. ongoing, standoff, adversaries neutralized). Confirm amount and nature of nuclear or other radioactive material.
Information analysis	<ul style="list-style-type: none"> Assess, confirm and validate alarms and alerts. Assess potential adversaries and associated networks. Protect sensitive information. Share appropriate information with partners. Assess the initial situation (e.g. adversary, method, nature of material involved, material stationary or in transport). Determine the nuclear security event type (i.e. Type 1, Type 2, Type 3). Monitor and review the ongoing nuclear security event. Estimate potential consequences (e.g. health, economic, societal, environmental) as overall goals of the response.^a Assess the possibility of multiple events or escalation of event type. Assess the potential international impact (e.g. impact on shipping and cross-border movement of goods or people). Identify appropriate response resources to deploy (applying a graded approach). Reassess the situation as more information is received.
Notification, activation and deployment ^b	<ul style="list-style-type: none"> Notify relevant organizations. Activate relevant organizations. Activate relevant response plans (e.g. contingency plan, emergency plans, national response plan). Deploy radiation monitoring teams. Establish predetermined multi-agency integrated response command structure at all levels (e.g. strategic, tactical, operational). Deploy appropriate resources. Reinforce security measures and activities at strategic locations. Create awareness and share information on the status of the event with all response organizations. Request international cooperation and assistance, as necessary.
Counteraction	<ul style="list-style-type: none"> Disrupt an ongoing nuclear security event. Reinforce security measures at the scene. Obtain functional control of the device, material and/or adversary. Render the device safe (as applicable). Take necessary steps to establish control of seized material. Take necessary steps to protect target set equipment and vital areas.

TABLE 1. EXAMPLES OF FUNCTIONAL OUTCOMES AND ASSOCIATED RESPONSE ACTIONS (cont.)

Functional outcome	Response actions
Criminal investigations	<p>Collect evidence associated with the nuclear security event.</p> <p>Implement radiological crime scene management, as applicable [26].</p> <p>Obtain eyewitness and expert witness testimony.</p> <p>Maintain the integrity of evidence and ensure the chain of custody.</p> <p>Conduct conventional and nuclear forensics, as needed.</p> <p>Support prosecution.</p>
Public information	<p>Release information to the public, as appropriate [18].</p> <p>Gather and analyse information from the public.</p> <p>Provide advice to the public.^c</p> <p>Reassure the public.</p>
Mitigation of consequences ^d	<p>Restrict public access to scene(s).</p> <p>Package, transport and store the radioactive material.</p> <p>Restore normality.</p>

^a Taking into account para. 1.7 and Refs [4, 9, 10, 17, 20], as applicable.

^b In the case of a nuclear or radiological emergency triggered by a nuclear security event, Refs [9, 13, 17, 21] apply for identifying the emergency response actions related to notification and activation. In this case, notification may also be a necessary emergency response action at the international level within the framework of the Early Notification Convention [27] and its operational tool, Operations Manual for Incident and Emergency Communication (EPR-IEComm) [11].

^c Taking into account Refs [4, 9, 18, 21], as applicable.

^d References [4, 10–19, 21] provide guidance on emergency response actions related to managing the consequences of a nuclear or radiological emergency triggered by a nuclear security event.

4.13. The competent authorities and other organizations involved in the response to nuclear security events may include, but are not limited to, the following:

- (a) Police and law enforcement agencies;
- (b) Fire and rescue services;
- (c) Health agencies;
- (d) Environmental agencies;
- (e) Intelligence agencies;
- (f) Nuclear regulatory bodies;
- (g) Border guards;

- (h) Coast-guards;
- (i) Customs officers;
- (j) Military units;
- (k) Ministries of the interior and/or foreign affairs, or their agencies;
- (l) Technical and scientific support organizations;
- (m) Operators of nuclear facilities;
- (n) Operators of associated facilities (e.g. radioactive material storage facilities, facilities with radioactive sources) and activities (e.g. transport of radioactive material);
- (o) Carriers of nuclear or other radioactive material;
- (p) Utility service providers (e.g. telecommunications, transport, gas, electricity, water, waste management).

PLANS AND PROCEDURES

4.14. The competent authorities and other organizations involved in the response to nuclear security events will have their own response plans and procedures, and their own arrangements as part of the overall national emergency management system. These plans and procedures should include the relevant response actions listed in Table 1, as well as other actions appropriate to the State's circumstances and to each organization's capabilities. If organizations develop specific plans and procedures for activities directly associated with nuclear security events, they should, where possible, ensure that they are complementary to existing plans and procedures to maintain synergies and to prevent conflicts. All such plans and procedures should be developed recognizing the roles and needs of partner agencies.

4.15. The grouping of nuclear security event types outlined in Section 3 may help organizations to develop plans and procedures which have the flexibility to adapt as the type of nuclear security event changes. The State should determine which of these plans and procedures need to be prioritized, based on the national threat and risk assessment and the State's judgement of acceptable risk.

4.16. States with nuclear facilities or nuclear material, and those with radioactive material, associated facilities or associated activities, should have specific response plans for events involving sabotage of these materials or facilities; in most cases, these plans will not be the same as those for events involving RDDs or REDs, or other events involving material out of regulatory control. When developing their national response framework, all types of nuclear security event

should be considered and the response plans developed should be appropriate to the State's circumstances.

MULTI-AGENCY COMMAND, CONTROL AND COORDINATION

4.17. If the nuclear security event results in the initiation of a nuclear or radiological emergency (see Table 1, footnote b), all the organizations listed in para. 4.13 will act under a unified command and control system [4] under the national emergency management system. The following paragraphs apply only to the response to nuclear security events that are not nuclear or radiological emergencies.

4.18. When defining the roles and responsibilities of the various organizations involved in the response to a nuclear security event, a State should ensure that the relationships between these organizations are clearly defined through formal protocols such as written agreements or memoranda of understanding. This is particularly important in view of the potential need for a significant number of different organizations that normally do not work together to cooperate in managing the response. These relationships are best defined and managed by the use of integrated, multi-agency command, control and coordination structures, which should be regularly tested and exercised to ensure their effectiveness.

4.19. The national framework should therefore facilitate appropriate multi-agency command, control and coordination for each type of nuclear security event. The extent and complexity of these arrangements may need to be flexible to allow for the escalation or de-escalation of command, control and coordination structures depending on the type of nuclear security event faced, and to take into account any arrangements already established for command, control and coordination for managing other situations, such as nuclear or radiological emergencies [9, 12, 20].

4.20. An integrated command, control and coordination structure for responding to a nuclear security event may include the following components, depending on the type of event being faced:

- (a) A policy level component;
- (b) A strategic (national) level component;
- (c) A tactical (local) level component;
- (d) An operational (on-scene) level component and associated off-scene activities [26].

4.21. The policy level component should include those individuals at the highest level of those organizations with overall responsibility for managing the response to a nuclear security event. A high level coordination body — comprising, for example, the head of government and a board of relevant ministers — should be established, as appropriate for the State's circumstances. This coordination body should make decisions on the overall management of the nuclear security event and be fully integrated into the coordinating structure for any required emergency response.

4.22. At the strategic level, a security strategic centre (or similar arrangement) should be established and staffed by, for example, senior officials from relevant national authorities, and be fully integrated into the coordinating structure for any required emergency response. Depending on the type and anticipated potential consequences of the event being faced, the strategic level component should carry out the following:

- (a) Provide advice at the policy level when decisions need to be taken;
- (b) Ensure that there is an appropriate command, control and coordination structure, and effective communication within it;
- (c) Assist and provide direction at the tactical level;
- (d) Determine the need for, and coordinate, international cooperation and assistance;
- (e) Manage public information and provide guidance at the tactical level;
- (f) Secure necessary human and financial resources, and logistics support.

4.23. At the tactical level, a local command post should be established and staffed by, for example, a multidisciplinary group of experts capable of providing technical advice on conducting field operations associated with the nuclear security event. The local command post should be fully integrated into the coordinating structure for any required emergency response. Depending on the type and potential consequences of the event being faced, the tactical level component should carry out the following:

- (a) Perform, and keep up to date, technical assessments of relevant threats, including consideration of potential consequences;
- (b) Make decisions on the implementation of field operations;
- (c) Establish tactical directions for the operational level component;
- (d) Ensure that those at the strategic level are regularly informed about the status of the nuclear security event;

- (e) Establish a decision making structure to ensure that directions received from the strategic level component with respect to public information are followed;
- (f) Allocate resources for the operational level;
- (g) Request additional support for operations, as needed.

4.24. The operational level component should comprise teams of individuals responsible for performing specific on-scene operations, from the various responding and support agencies. Depending on the type and potential consequences of the event being faced, the operational level component should carry out the following:

- (a) Provide on-scene direction to the personnel responding to the nuclear security event on carrying out their security related tasks in a manner such that their health and safety are adequately protected;
- (b) Ensure that those at the tactical level are regularly informed about the progress and magnitude of the nuclear security event;
- (c) Follow directions received from the tactical level of command;
- (d) Ensure that information relevant to the developing criminal investigation is reported in a timely manner.

4.25. Effective communication within and between each level of the command, control and coordination structure, and including all relevant organizations, is critical to the efficiency, effectiveness and coherence of the response. Effective, well planned and well defined communication protocols within and between each level of command should ensure that the resources of the different organizations are coordinated effectively during the response. Such protocols should be contained within the national framework.

4.26. Figure 5 shows an example of an integrated command, control and coordination structure.

NATIONAL COORDINATION

4.27. The State should establish coordination arrangements to promote the effective, timely and secure exchange of information between organizations involved in the response to a nuclear security event and between the various levels of command. This coordination should be achieved and evaluated through formal arrangements such as agreements and protocols.

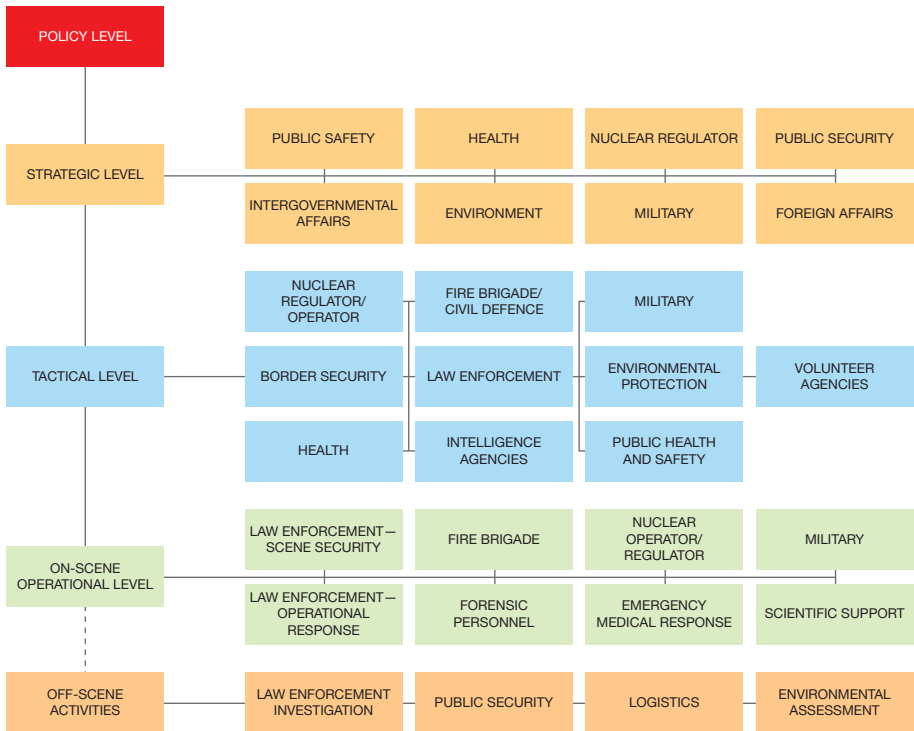


FIG. 5. Example of an integrated command, control and coordination structure.

4.28. The State should establish, as part of its national arrangements, plans and procedures for the provision of information to the public during a nuclear security event, taking into account the need to protect the confidentiality of sensitive information. Reassuring the public and providing public health information, where appropriate, should be components of any State’s national response plan. These arrangements should be included within the national framework.

5. INFRASTRUCTURE FOR A NATIONAL FRAMEWORK FOR MANAGING THE RESPONSE TO NUCLEAR SECURITY EVENTS

AUTHORITY

5.1. A State should identify a body to coordinate the development and maintenance of the national framework for managing the response to nuclear security events. This body should also be responsible for coordinating the development and maintenance of the multi-agency plans and procedures for managing nuclear security events within the national framework and for integrating them with the State's overall emergency response arrangements. This coordination responsibility should be clearly defined in accordance with appropriate legislation, policies and procedures. A competent authority should be assigned responsibility for leading the response to nuclear security events; whether this authority is the body responsible for coordinating the response framework or another body is a decision for the State.

5.2. Where a nuclear security event may result in a nuclear or radiological emergency, the infrastructure for the response to nuclear security events should be integrated with the infrastructure needed to perform emergency response functions in accordance with relevant Safety Requirements [4] and related guidance [20].

CAPABILITIES AND RESOURCES

5.3. Within its national framework, a State should identify the capabilities and resources that are needed to respond to the different types of nuclear security event outlined in Section 4, describing through appropriate plans and procedures how these will be obtained and sustained during the response. The State should identify the types of nuclear security event for which it has adequate capabilities and/or resources to respond, including human resources with specialized knowledge, skills and abilities to take appropriate actions to deal with the nuclear security event. Where the State identifies that it does not have sufficient capabilities or resources to deal with a type of nuclear security event, its plans should describe how it will obtain the necessary additional capabilities or resources, for example through a memorandum of understanding with a neighbouring State, from

an international organization such as the IAEA, or under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency [28].

5.4. Capabilities and resources that should be available to a State may include, but are not limited to, the following:

- (a) Specialist law enforcement capabilities (such as fully trained responders and specialist investigators);
- (b) Technical and scientific support;
- (c) Specialized rescue capabilities;
- (d) Medical support;
- (e) Nuclear forensics support;
- (f) Equipment and personnel for site survey and search operations (e.g. for aerial, terrestrial or maritime survey);
- (g) Equipment for secure communications;
- (h) Media contact points and public information specialists;
- (i) Specialized equipment, such as explosives detectors or equipment for handling pyrophoric materials, and personnel able to use it;
- (j) Criticality control procedures and equipment;
- (k) Radiation detection instruments (mobile and stationary);
- (l) Personal protective equipment;
- (m) Sample analysis (including delivery of samples and communication of results);
- (n) Information on radiation and radioactive materials for responders who do not have such knowledge.

TRAINING AND EXERCISES

5.5. All individuals and organizations with defined roles in the response to nuclear security events should be appropriately prepared. This preparation should give them a clear understanding of their single agency and relevant multi-agency plans and procedures, as well as their roles and responsibilities within the response and those of their partner agencies. All such individuals and organizations should be given the opportunity to test their preparedness through regular exercises. For example, since timely response to a nuclear security event is very important, the time taken by different stakeholders to respond during the exercise should be measured and reviewed.

5.6. Those organizations likely to be involved in the response to nuclear security events should regularly train and exercise together. Training, drills and exercises

should address all aspects of plans and procedures, and be conducted at the local and national levels [13]. Within the national response framework, a State should specify the frequency and extent of required national level training and exercises.

5.7. Organizations should identify and make available the relevant capabilities and resources to ensure that they can comply with such national training and exercise requirements.

5.8. Special attention should be given to training of non-specialist response organizations on specific nuclear security and safety aspects that may be relevant to their involvement in response to nuclear security events.

6. INTERNATIONAL COOPERATION AND ASSISTANCE

GENERAL

6.1. The response to nuclear security events may require a request for international assistance, for example where a State lacks the specialist capabilities or resources to deal with the type of event being faced. In such cases, the international assistance should be coordinated with the national response. States should describe within their national framework how they intend to exchange information with other States or relevant international organizations, such as the IAEA. Bilateral and/or multilateral arrangements for cooperation and assistance should be established, as necessary, within the national framework, to ensure that international assistance can be obtained promptly, if requested.

6.2. If a nuclear security event initiates a nuclear or radiological emergency, international cooperation and assistance should take place within the international emergency preparedness and response framework. A State's arrangements for exchange of information on law enforcement issues should take into account national requirements for the confidentiality of sensitive information.

6.3. States should share lessons identified and best practices in developing and implementing a national framework (to the extent allowed by confidentiality requirements).

ARRANGEMENTS FOR INTERNATIONAL COOPERATION AND ASSISTANCE FOR NUCLEAR SECURITY EVENTS

6.4. International cooperation and assistance for response to nuclear security events may involve a wide range of organizations, capabilities and resources.

6.5. Arrangements for obtaining international cooperation and assistance should be established in advance and should form a key element of a State's national framework. The mechanisms for such cooperation and assistance should be planned and exercised to ensure that they can be implemented effectively should a nuclear security event occur.

6.6. National legal arrangements should be in place to facilitate requests to other States or international organizations for assistance and, if relevant, provision of assistance to other States, at their request.

6.7. Several international legal instruments and other international initiatives impose obligations on aspects of the response to nuclear security events. These should be identified and incorporated into the national framework and, where appropriate, into the national response plan. Examples of such binding and non-binding instruments and initiatives include the following:

- (a) The Convention on the Physical Protection of Nuclear Material [5] and the 2005 Amendment thereto [29];
- (b) The International Convention for the Suppression of Acts of Nuclear Terrorism [6];
- (c) The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency [28];
- (d) The Convention on Early Notification of a Nuclear Accident [27];
- (e) The IAEA's Incident and Trafficking Database (ITDB);
- (f) The Operations Manual for Incident and Emergency Communication (EPR-IEComm) [11];
- (g) The IAEA's Response and Assistance Network (RANET) [14];
- (h) The International Criminal Police Organization–INTERPOL's Operation Fail Safe.

These instruments and initiatives have each established distinct objectives and protocols for receiving and exchanging relevant information with and between States. States should understand these objectives and protocols when considering how they may be included as resources in a national framework.

6.8. A State's obligations in relation to international cooperation and assistance, arising from bilateral and/or international treaties and conventions to which it is party, may include the following:

- (a) Reporting cases of unauthorized removal or sabotage. In such a case, or a credible threat thereof, the State should provide information as soon as possible to other States that may be affected and to the IAEA and other relevant international organizations.
- (b) In the case of theft of nuclear material, or a credible threat thereof, informing other States that may be affected as soon as possible.

If these are not obligations under a binding legal instrument, they may nevertheless be considered good practice.

6.9. In relation to the reporting and sharing of information in relation to nuclear security events, a State's arrangements should include predefined policies, procedures and protocols at the national and international levels in order to make the exchange of information between States, and where relevant between States and international organizations, as effective as possible in the event of a nuclear security event. Such policies, procedures and protocols should be contained within the national framework. Policies, procedures and protocols should include the following:

- (a) Information sharing and intelligence cooperation;
- (b) A process for sharing information with organizations that are outside the State's national response structure, where necessary;
- (c) Points of contact for regional and international response assistance;
- (d) Contact information for regional and international expertise, special training or services needed for response;
- (e) Requirements for the identification and handling of sensitive information, and measures to ensure that critical information is available and understandable to all those needing it for their response role;
- (f) Exchange of lessons identified following nuclear security events.

6.10. Other areas in which a State may have obligations in relation to international cooperation and assistance arising from bilateral and/or international treaties and conventions to which it is party include the following:

- (a) Recovery and return of seized items;
- (b) Rendering of assistance upon request;
- (c) Technical cooperation and assistance;

- (d) Agreements to provide transport assets and actions to ensure continued capability to respond during a nuclear security event;
- (e) Coordination of law enforcement investigations and prosecutions.

6.11. States are encouraged to establish and maintain dialogue at the international level in order to benefit from, and contribute to, the provision of assistance during the response to a nuclear security event. States should seek to interact on a regular basis, to develop and conduct exercises, and to test their international preparedness and response capabilities. States should also seek to take advantage of international training, such as that available at nuclear security support centres, to build capacity and develop human resource capabilities.

6.12. International assistance arrangements should be tested through regular drills and exercises involving regional and/or international components, as appropriate.

7. SUSTAINABILITY

7.1. A national framework should be sustained to ensure that it continues to meet the evolving needs of the State. Sustaining a national framework involves continuously maintaining and reviewing, and periodically updating and improving, systems and processes, including equipment, procedures, protocols and cooperative arrangements. Continued investment in human and technical resources by a State is necessary to ensure that systems and processes remain effective and can be improved to meet new and evolving threats. Key actions to support sustainability include the following:

- (a) Providing strong and continuing leadership support.
- (b) Establishing and maintaining adequate funding dedicated to response planning.
- (c) Periodic exercising and evaluation of capabilities to maintain assurance of the ability to respond effectively.
- (d) Maintaining adequate human resources and keeping their competencies up to date.

- (e) Establishing and maintaining mechanisms⁵ to guide programmes for preparedness and response to nuclear security events.
- (f) Establishing and maintaining reliable points of contact at the local, national, regional and international levels for all aspects of the national framework and national response plan. Contacts should include entities responsible for the following:
 - Resources and equipment;
 - Plans and procedures;
 - Notification;
 - Drills and exercises;
 - Identification and processing of lessons;
 - Addressing questions and resolving conflicts;
 - Regional and international cooperation and arrangements;
 - Maintaining continuity within and between entities.
- (g) Establishing and maintaining national, regional and international funding arrangements.
- (h) Establishing and maintaining strong links with stakeholders, in particular those involved in emergency response.
- (i) Establishing and maintaining strong links with the media.
- (j) Establishing and maintaining an evaluation process.

PERIODIC REVIEW OF THREAT ASSESSMENT

7.2. IAEA Nuclear Security Series No. 24-G, Risk Informed Approach for Nuclear Security Measures for Nuclear and Other Radioactive Material out of Regulatory Control [21], provides guidance on how threat assessments for nuclear and other radioactive material out of regulatory control should be conducted. Sustaining the threat assessment involves regular reviews and updates to ensure that the national response plan remains relevant to the evolving threats. Awareness of the nature and level of threats needs to be maintained at all levels (local, national and international), to enable the timely sharing of pertinent threat assessment information with others and to ensure that the national response plan is based on the most up-to-date information.

⁵ These mechanisms should be the responsibility of the coordinating body discussed in Section 5. This body should provide a central point of contact responsible for identifying, disseminating information on and prioritizing what is needed to maintain or improve preparedness and response programmes for nuclear security events. It should also provide a framework to address specific aspects of local, national, regional and international need for improvement.

7.3. The scenarios and planning assumptions used in designing response plans should be based on current national, regional and international threat assessment information.

PERIODIC REVIEW OF NATIONAL, REGIONAL AND INTERNATIONAL ARRANGEMENTS

7.4. Once national, regional and international cooperation and assistance arrangements have been defined, a schedule and procedure for periodic reviews should be established. Such schedules may include routine regular reviews (e.g. annually, biennially) but should also provide for a review to be triggered by any major changes to arrangements or the threat assessment.

SHARING OF EXPERIENCE

7.5. The effective sharing of knowledge and experience between States can help to sustain a State's ability to manage its response to nuclear security events, by ensuring that good practices are recognized and adopted by responding agencies. As a part of the national framework, local, national and international organizations with responsibility for, or experience of, nuclear security events are encouraged to develop protocols to enable appropriate sharing of knowledge and experience with other organizations, to the extent compatible with confidentiality requirements.

7.6. Considerations when sharing experience include the following:

- (a) Establishing and using appropriate information sharing tools (e.g. secure communication networks, early warning systems, databases);
- (b) Establishing regular meetings specifically for the sharing of knowledge and experience regarding nuclear security events;
- (c) Sharing of plans, procedures and updates, as appropriate;
- (d) Summarizing, in peer reviewed journals and other appropriate publications, experience from responding to nuclear security events.

INCORPORATION OF LESSONS IDENTIFIED, EVALUATION AND GAP ANALYSIS

7.7. Lessons identified from the response to nuclear security events, together with evaluations of the outcomes of training and exercises, should be made available to relevant local, national and international organizations, subject to the requirements of confidentiality. Such information is valuable in the identification of good practices, corrective actions and procedural enhancements. Organizations receiving such information should review it to determine what, if any, information applies to their response activities. When such information is applicable, it should be taken into account when developing and updating plans and procedures.

7.8. Gap analyses and risk assessments should be kept up to date, and changes in technology and procedures should be reviewed to determine whether changes to existing practices would enhance capabilities. Gap analyses compare expected outcomes against actual outcomes to identify where gaps exist. These gaps should be reviewed to determine their cause and to identify how to address them, as well as good practices and/or opportunities for improvement, as appropriate.

MAINTENANCE AND ENHANCEMENT

7.9. Plans for response to nuclear security events should be maintained and enhanced as appropriate. Examples of maintenance may include routine updates of documentation (e.g. protocols, plans, agreements, procedures, threat assessments, training documents), database management, contact updates, facility and equipment management activities, and other actions needed to ensure ongoing readiness.

7.10. Enhancements to improve the performance of routine activities may be identified as a result of changes in organizational leadership or programme direction, the availability of new technologies, changes in the threat assessment, reviews of lessons identified, experience from actual nuclear security events or results of evaluations and gap analyses.

7.11. Maintenance may be performed routinely at scheduled intervals; however, the nature of nuclear security events means that maintenance of the components of a national response framework may often need to be undertaken outside a regular cycle, for example when the threat assessment changes and the State needs to update its national response plan to reflect this.

7.12. States may therefore need to allocate funding both for routine maintenance activities and for ad hoc reactive maintenance as the need arises. Where circumstances dictate that several enhancements of the national framework's components are needed, these may need to be prioritized so that limited funds can be used to implement the most important enhancements first.

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GLOSSARY

associated activity. The possession, production, processing, use, handling, storage, disposal or transport of nuclear material or other radioactive material.

associated facility. A facility (including associated buildings and equipment) in which nuclear material or other radioactive material is produced, processed, used, handled, stored or disposed of and for which an authorization is required.

authorization. The granting by a competent authority of written permission for operation of an associated facility or for carrying out an associated activity, or a document granting such permission.

competent authority. A governmental organization or institution that has been designated by a State to carry out one or more nuclear security functions; for example, competent authorities may include regulatory bodies, law enforcement, customs and border control, intelligence and security agencies or health agencies, etc.

contingency plan. Predefined sets of actions for response to unauthorized acts indicative of attempted unauthorized removal or sabotage, including threats thereof, designed to effectively counter such acts.

emergency. A non-routine situation or event that necessitates prompt action, primarily to mitigate a hazard or adverse consequences for human life, health, property and the environment.

- This includes nuclear and radiological emergencies and conventional emergencies such as fires, releases of hazardous chemicals, storms or earthquakes.
- This includes situations for which prompt action is warranted to mitigate the effects of a perceived hazard.

emergency response. The performance of actions to mitigate the consequences of an emergency for human life, health, property and the environment.

- The emergency response also provides a basis for the resumption of normal social and economic activity.

graded approach. The application of nuclear security measures proportionate to the potential consequences of criminal or intentional unauthorized acts involving or directed at nuclear material, other radioactive material, associated facilities or associated activities, or other acts determined by the State to have an adverse impact on nuclear security.

nuclear facility. A facility (including associated buildings and equipment) in which nuclear material is produced, processed, used, handled, stored or disposed of and for which an authorization or licence is required.

nuclear material. Any material that is either special fissionable material or source material as defined in Article XX of the IAEA Statute.

nuclear or radiological emergency. An emergency in which there is, or is perceived to be, a hazard due to:

- (a) The energy resulting from a nuclear chain reaction or from the decay of the products of a chain reaction; or
- (b) Radiation exposure.

nuclear security event. An event that has potential or actual implications for nuclear security that must be addressed.

nuclear security regime. A regime comprising:

- The legislative and regulatory framework and administrative systems and measures governing the nuclear security of nuclear material, other radioactive material, associated facilities and associated activities;
- The institutions and organizations within the State responsible for ensuring the implementation of the legislative and regulatory framework and administrative systems of nuclear security;
- Nuclear security systems and nuclear security measures for the prevention of, detection of and response to nuclear security events.

operator. Any person, organization or government entity licensed or authorized to undertake the operation of an associated facility or to perform an associated activity.

other radioactive material. Any radioactive material that is not nuclear material.

out of regulatory control. See regulatory control.

radiation exposure device (RED). A device with radioactive material designed to intentionally expose members of the public to radiation.

radioactive material. Any material designated in national law, regulation or by a regulatory body as being subject to regulatory control because of its radioactivity. In the absence of such a designation by a State, any material for which protection is required by the current version of the International Basic Safety Standards¹.

radiological dispersal device (RDD). A device to spread radioactive material using conventional explosives or other means.

regulatory control. Any form of institutional control applied to nuclear material or other radioactive material, associated facilities or associated activities by any competent authority as required by the legislative and regulatory provisions related to safety, security or safeguards. The phrase ‘out of regulatory control’ is used to describe a situation where nuclear or other radioactive material is present in sufficient quantity that it should be under regulatory control, but control is absent, either because controls have failed for some reason or because they never existed.

risk. The potential for an unwanted outcome resulting from a nuclear security event as determined by its likelihood and the associated consequences.

risk assessment. The overall process of systematically identifying, estimating, analysing and evaluating risk for the purpose of informing priorities, developing or comparing courses of action, and informing decision making.

sabotage. Any deliberate act directed against an associated facility or associated activity that could directly or indirectly endanger the health and safety of personnel, the public or the environment by exposure to radiation or release of radioactive substances².

¹ INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, WORLD HEALTH ORGANIZATION, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements, IAEA Safety Standards Series No. GSR Part 3, IAEA, Vienna (2014).

² Radioactive substance and radioactive material have the same meaning.

sensitive information. Information, in whatever form, including software, whose unauthorized disclosure, modification, alteration, destruction or denial of use could compromise nuclear security.

strategic location. A location of high security interest in the State which is a potential target for terrorist attacks using nuclear material or other radioactive material, or a location at which nuclear material or other radioactive material that is out of regulatory control is located.

target. Nuclear material, other radioactive material, associated facilities, associated activities, or other locations or objects of potential exploitation by a nuclear security threat, including major public events, strategic locations, sensitive information and sensitive information assets.

threat assessment. An evaluation of the threats — based on available intelligence, law enforcement and open source information — that describes the motivations, intentions and capabilities of these threats.



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