Nuclear Security Recommendations

on

Nuclear and other Radioactive Material
out of Regulatory Control

Jointly Sponsored by:

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FORWORD

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PREFACE

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1. INTRODUCTION

Background

1.1. The IAEA has established a Nuclear Security Programme and instituted a Nuclear Security Series of publications to provide recommendations and guidance that States can use to strengthen their national nuclear security regime. Nuclear Security Fundamentals [2], the overarching publication in the Nuclear Security Series, guides States on the objectives and essential elements of nuclear security and establishes the basis for recommendations level publications for establishing, carrying out and maintaining an effective nuclear security regime.

1.2. This current document is a recommendations level publication for nuclear security of nuclear and other radioactive material that is out of regulatory control. In developing these recommendations, national experience and practice and guidance publications in the field of nuclear security were used, as were the primary nuclear security related international legal instruments such as Convention on the Physical Protection of Nuclear Material and its Amendment [3], International Convention for the Suppression of Acts of Nuclear Terrorism [4], United Nations Security Council Resolution 1540 [5] and the Code of Conduct on the Safety and Security of Radioactive Sources [6]. An overview of the legislative history and salient provisions of the primary international instruments, both binding and non-binding, that are related to nuclear security has been published in the IAEA’s Legal Series [7]. Another resource for relevant International Conventions and Treaties is the publication on International Instruments related to the Prevention and Suppression of International Terrorism [8]. These recommendations should be taken in conjunction with obligations undertaken by States parties to applicable international instruments and are not intended to override or modify obligations under such instruments.

1.3. This publication is complementary to and consistent with the following other nuclear security recommendations publications on:

- Nuclear Material and Nuclear Facilities (Physical Protection of Nuclear Material and Nuclear Facilities - INFCIRC/225/Rev.5) [9]; and
- Radioactive Material and Associated Facilities [10],

which provide recommendations for nuclear material and other radioactive material that is under regulatory control.

1.4. The focus of the recommendations to a State contained in this publication is on security related measures associated with nuclear and other radioactive material that is out of regulatory control. References are made to safety related and emergency response guidance throughout the text in order to emphasize the importance of the interface between safety and security.

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1 Italicized words in the text represent defined terms as found in the Nuclear Security Glossary [1]. The recommendations outlined in this document are based on the provisions of relevant binding and non-binding instruments related to nuclear security. When drafting domestic legislation based on these instruments, States should ensure that the definitions used therein are properly incorporated in their domestic legislation.
Purpose

1.5. The purpose of this publication is to guide States in strengthening their nuclear security regime, and thereby contributing to an effective global nuclear security framework, by providing:

- Recommendations to States and their competent authorities on the establishment or improvement of the capabilities of their nuclear security regimes, for carrying out effective strategies to deter, detect and respond to a criminal act, or an unauthorized act, with nuclear security implications, involving nuclear or other radioactive material that is out of regulatory control; and
- Recommendations to States in support of international cooperation and coordination aimed at ensuring that any nuclear or other radioactive material that is out of regulatory control, whether originating from within the State or from outside that State, is placed under regulatory control and the alleged offenders are, where appropriate, prosecuted or extradited.

The recommendations are provided for consideration by States and competent authorities, but are not mandatory upon a State and do not infringe the sovereign rights of States.

Scope

1.6. This publication covers recommendations to a State for the nuclear security of nuclear or other radioactive material that has been reported as being out of regulatory control as well as for material that is lost, missing or stolen but has not been reported as such, or has been otherwise discovered.

1.7. This publication includes recommendations to a State for the detection and assessment of alarms and alerts and for a graded response to criminal or unauthorized acts with nuclear security implications involving nuclear or other radioactive material out of regulatory control. The recommended actions cover the confirmation of a credible threat, assessment and interdiction of an attempted act and response to a nuclear security event.

1.8. The publication does not provide recommendations for security of nuclear material or other radioactive material that is under regulatory control. Recommendations for such material can be found in the Nuclear Security Series recommendations publications mentioned in 1.3.

1.9. This publication does not provide recommendations on preventing and protecting against sabotage of nuclear material and other radioactive material in authorized use, storage, or transport or in case of sabotage of their associated facilities and associated activities. These matters are addressed in Nuclear Security Series recommendation publications identified in 1.3. [9], [10]

1.10. For a nuclear security event with exposure, potential exposure or dispersal of nuclear or other radioactive material, the focus of this publication is on recommendations to a State on the recovery and security of the material and the management of the nuclear security event. States should refer to IAEA Safety Standards for further information about the measures needed for protection of health and safety, which are of primary importance in responding to an exposure or dispersal event.

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2 The “criminal act” is normally covered by criminal or penal law in a State, whereas an “unauthorized act” is typically the subject of administrative or civil law. In addition, criminal acts involving nuclear or other radioactive material may constitute offences related to an act of terrorism which, in some States, are subject to special legislation that may be of relevance in following these recommendations. Examples of a criminal act or an unauthorized act with nuclear security implications could include: 1) authorized person is conducting unauthorized activities involving such material; 2) unauthorized person is in unauthorized possession of such material without good cause; or 3) nuclear or other radioactive material which has been abandoned or is lost or missing or has been stolen is found and/or transferred between persons with the prospect of ending up in the hands of another person who has an intent to undertake a malicious act using such material.
Structure

1.11. Section 2 provides the objectives of the nuclear security regime of a State. Section 3 provides general recommendations to the State and in particular for the roles and responsibilities of the State and various competent authorities and on national threat assessment. Section 4 covers the preventive measures such as deterrence, information security and trustworthiness. Section 5 provides recommendations to a State on detection measures including interdiction and initial assessment of any instrument alarms or information alerts. Section 6 provides recommendations to a State on response measures to a nuclear security event. Section 7 covers recommendations on international cooperation.

2. OBJECTIVES OF A STATE’S NUCLEAR SECURITY REGIME FOR NUCLEAR AND OTHER RADIOACTIVE MATERIAL OUT OF REGULATORY CONTROL

2.1. The overall objective of a State’s nuclear security regime is to protect persons, property, society, and the environment from malicious acts involving nuclear material or other radioactive material. These objectives can be achieved by the implementation of all the nuclear security recommendations publications including the Nuclear Security Recommendations on Nuclear Material and Nuclear Facilities (Physical Protection of Nuclear Material and Nuclear Facilities - INFCIRC/225/Rev.5) [9] and Nuclear Security Recommendations on Radioactive Material and Associated Facilities [10] in a consistent manner. The objectives of a nuclear security regime for nuclear and other radioactive material out of regulatory control are achieved by:

a. A comprehensive and complete set of legislative provisions through adaptation of criminal and administrative laws for providing relevant administrative and enforcement powers to the various competent authorities within the State, so that they can undertake their activities in an effective manner; and

b. Provision of sufficient and sustained resources to the various competent authorities to enable them to carry out their assigned functions, including:

1. Measures to prevent a criminal act, or an unauthorized act, with nuclear security implications involving nuclear and other radioactive material out of regulatory control;

2. Detection, through an instrument alarm and/or an information alert, of the presence or indications of a criminal act, or an unauthorized act, with nuclear security implications involving nuclear or other radioactive material that is out of regulatory control and, in particular to:
   • develop a detection strategy;
   • establish detection systems; and
   • perform the initial assessment of the instrument alarms and information alerts promptly and assess the possibility of a nuclear security event.

3. Response to the nuclear security event, in particular to:
   • notify the competent authorities;
   • assess the validity and potential consequence of the nuclear security event;
   • locate, identify, categorize and characterize nuclear or other radioactive material;
   • secure such material and apply other response measures appropriate to the nuclear security event, such as neutralization of the device;
   • recover, detain and/or seize and place such material under regulatory control;
   • collect, preserve, store, transport and analyse evidence, including the application of nuclear forensics measures, related to a criminal act, or an unauthorized act, with nuclear security implications that involves such material; and
   • apprehend and subsequently prosecute or extradite alleged offenders.
3. STATE’S NUCLEAR SECURITY REGIME FOR NUCLEAR AND OTHER RADIOTOACTIVE MATERIAL OUT OF REGULATORY CONTROL

3.1. The essential elements of the State’s nuclear security regime [2] are applicable to the nuclear security recommendations on nuclear and other radioactive material out of regulatory control and should be referred to in the establishment and implementation of the State’s nuclear security regime, as appropriate.

Roles and responsibilities of the State

3.2. As part of an overall framework, the State should establish and maintain effective executive, judicial, legislative and regulatory frameworks to govern the detection of and response to a criminal act, or an unauthorized act, with nuclear security implications involving any nuclear or other radioactive material that is out of regulatory control. Responsibilities should be clearly defined for implementing various elements of nuclear security and assigned to the relevant competent authorities, as described in 3.15 to 3.18.

3.3. In establishing legislative and regulatory frameworks to govern nuclear security, the State should define the conduct which it considers to be a criminal act, or an unauthorized act, with nuclear security implications.

3.4. The State should establish as criminal offences under domestic law the wilful, unauthorized acquisition, possession, use, transfer or transport of nuclear or other radioactive material consistent with international treaties, conventions and legally binding United Nations Security Council resolutions.

3.5. The State should also establish as criminal offences a threat, attempt or preparation to commit an offence as described in 3.4 above.

3.6. The State should consider establishing as criminal offences, unlawful scams or hoaxes[^3] with nuclear security implications.

3.7. The State should establish its jurisdiction over any criminal act associated with a nuclear security event on the basis of the presence of the alleged offender on its territory, irrespective of the nationality of the alleged offender, or the State where the alleged offence has been perpetrated and whether or not national interests of the State having jurisdiction over the offence have been affected.

3.8. Effective and sustainable detection and response measures rely on multidisciplinary infrastructures implemented by several independent competent authorities in the State. The State should ensure proper cooperation, coordination, information exchange and integration of activities and responsibilities clearly defined that are distributed across multiple competent authorities, and establish a coordinating mechanism or identify an existing governmental body, committee or organization to act as the coordinating body, as described in 3.12 to 3.14. In carrying out the nuclear security measures, the State should take into consideration the results of the threat assessment.

3.9. The State should ensure effective coordination among the different levels and jurisdictions of federal, state, and local authorities.

3.10. The State should ensure that the various competent authorities responsible for relevant nuclear security measures develop a nuclear security culture with necessary training and exercises and have the necessary resources to deal with the management of an alarm or an alert, and with any consequent nuclear security event.

3.11. The State should ensure effective cooperation with other States and with the relevant international organizations regarding any nuclear security event as outlined in this publication. In particular, the State should nominate a national point of contact for other States and for the relevant international organizations for all matters related to detection of and response to such acts.

[^3]: Historically, scams and hoaxes constitute a portion of the cases of illicit trafficking. Despite the absence of nuclear or other radioactive material, such scams and hoaxes can necessitate responses that potentially expose operational and/or detection vulnerabilities that could be exploited by smugglers. Scams and hoaxes can perpetuate the belief that smuggling such material can be profitable and may encourage criminal or unauthorized possession of nuclear or other radioactive material.
Coordinating body or mechanism

3.12. All nuclear security activities involving nuclear or other radioactive material that may be out of regulatory control should be coordinated by a body or an effective mechanism in accordance with national legislation and regulations.

3.13. The State through its coordinating body or mechanism should ensure that the roles and responsibilities of the competent authorities are clearly defined and that possible conflicts are identified and resolved. In particular, it should review the detection strategy, response plans, procedures, necessary infrastructure for the respective activities and, as appropriate, coordinate training activities, drills and exercises at the national level.

3.14. The State through its coordinating body or mechanism should inter alia:

- ensure the development of a comprehensive national detection strategy based on a multilayered defence-in-depth approach within available resources;
- ensure development of a national response plan for any nuclear security event in a graded approach commensurate with the threat and based on available resources;
- oversee the development and implementation of the national detection and response systems;
- re-evaluate and identify possible nuclear security gaps and resource needs and initiate proper corrective actions on a regular basis;
- ensure the establishment of contact points within the competent authorities as part of an overall coordination within the State;
- encourage the timely sharing of operational information among competent authorities within the State;
- ensure the establishment and maintenance of a reliable and comprehensive set of records for each nuclear security event, and encourage the exchange of information among competent authorities concerning any such event, using a common reporting and notification format; and
- ensure appropriate coordination and cooperation with relevant authorities in other States and international organizations.

Competent authorities

3.15. The competent authorities should have responsibilities for putting in place and implementing the detection and response measures within their areas of authority related to the nuclear security regime of the State.

3.16. The functions of the competent authorities should include, inter alia:

- contributing to the development of the national detection strategy and response plan;
- developing, operating and maintaining the national detection systems, assessment procedures and the national response plan and providing the resources necessary for implementing and testing the associated activities;
- providing adequate training and information to all personnel involved in carrying out nuclear security detection and response measures;
- sustaining the detection and response capabilities and ensuring operational preparedness through sound management practices, addressing instrument maintenance, personnel training, exercises and process improvements; and
- cooperating with the coordinating body, other competent authorities and bilateral and multilateral counterparts as applicable, in part to ensure the effectiveness of their detection and response procedures and responsibilities.

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4 An example of a coordinating body is a committee with representatives of all relevant competent authorities. If the State has a federal structure, the coordinating body could be established at the federal and at the state level.

5 When an organization or institution carries out nuclear security functions in its capacity as an authorized person, it is not considered to be acting as a competent authority.
3.17. The competent authorities should cooperate in the exchange of relevant information on the nuclear security of nuclear and other radioactive material under regulatory control within the State, with a view to strengthening the capabilities of all concerned with nuclear security. Where appropriate, they should also cooperate with their counterparts in other States.

3.18. The regulatory authorities should take appropriate actions when nuclear or other radioactive material is reported to be out of regulatory control, i.e., lost, missing or stolen. In particular, they should inform promptly the other competent authorities in the event of a suspected criminal or an unauthorized act with nuclear security implications.

National threat assessment

3.19. For the preparation of the detection strategy, response plan and design of nuclear security systems, the State should identify strategic locations and perform a national threat assessment against criminal acts, and unauthorized acts, with nuclear security implications involving nuclear or other radioactive material out of regulatory control. Competent authorities should work closely together and consider, inter alia:

- the threat through and to the transboundary movement and transport of goods and movement of persons;
- the threat to strategic locations;
- the location of and vulnerability to the criminal or unauthorized acquisition of nuclear and other radioactive material under regulatory control and consequences of their misuse; and
- the intent and capability of potential offenders who may wish to use this material for a malicious act, or to transport it from, to or through State territory.

3.20. The State should establish procedures for reliable and timely exchange of threat information related to nuclear security, both domestically and internationally, in accordance with its national information security policies and regulations, and international obligations.

3.21. The State should assign priorities and design the detection and response systems based on its national threat assessment and a risk based approach in combination with the following points:

- vulnerability to a criminal act, or an unauthorized act, with nuclear security implications, both within and outside their borders;
- relative attractiveness of identified targets to a nuclear security threat;
- possible consequences of a criminal act, or an unauthorized act, with nuclear security implications, that involves the use of nuclear or other radioactive material; and
- possible evolution of the threat or vulnerabilities.

3.22. The State should update the threat assessment periodically and as the need arises. In particular, the State should consider undertaking a threat assessment for major public events.

4. RECOMMENDATIONS ON PREVENTIVE MEASURES

This Section contains recommendations that are the basis for detection and response measures. Preventive measures are intended to prevent a criminal act, or an unauthorized act, with nuclear security implications at an early stage of the act or before the act is fully implemented. The other nuclear security recommendations publications [9, 10] refer to the concept of prevention which is intended to protect nuclear and other radioactive material and sensitive information against theft or other malicious acts and sabotage to associated facilities and associated activities.

Deterrence

4.1. The State should ensure that offences established under its laws for criminal or unauthorized acts with nuclear security implications are punishable by appropriate penalties which take into account their grave nature, consistent with international treaties, conventions and legally binding United Nations Security Council resolutions.

4.2. The State should consider adopting other measures to deter criminal or unauthorized acts with nuclear security implications in accordance with the national policies, laws and regulations.
4.3. The State should consider using nuclear forensics for assisting authorities to link seized material to people, places and events for deterring criminal or unauthorized acts involving nuclear or other radioactive material. Nuclear forensics is also an important element of the response measures as discussed in 6.14.

4.4. The State should consider the public dissemination of appropriate information as part of deterrence including information regarding detection capability, threat environment and punishment in accordance with the State’s information security policy as discussed in 4.5 to 4.9.

Information security

4.5. The State should define the national policy on sensitive information and assign responsibilities to the various competent authorities for information security related to systems for detection of and response to a criminal act, or an unauthorized act, with nuclear security implications involving the use of any nuclear and other radioactive material out of regulatory control. This should be derived from and integrated with other policies of the State on information security.

4.6. The State should specify what nuclear security information could be misused by a possible offender and therefore should be protected. In particular, the information on the detection and response systems and associated procedures should be properly protected.

4.7. When defining the national policy on sensitive information, consideration should be given to ensuring that law enforcement personnel, other responders and personnel of the competent authorities have access to sufficient information to perform their duties.

4.8. The national policy on information security should detail what and how information regarding detection and response systems and protocols will be shared with other States, particularly neighbouring States and relevant international organizations. The exchange of information with other States on nuclear security events is covered in Section 7.

4.9. Each competent authority should have an information security policy and should establish the rules for protecting the confidentiality and integrity of sensitive information and for the dissemination of such information to other competent authorities within and outside the State on a need-to-know basis. The competent authorities should ensure that all relevant personnel are trained in procedures for information security.

Trustworthiness of personnel

4.10. Taking into account national legislation, the competent authorities should ensure that the personnel involved in nuclear security activities in the areas of detection and response, are explicitly deemed trustworthy, to the appropriate levels for their roles, by a formal process. This formal process should serve to assist in reducing the risk of authorized personnel engaging in illegal activities, e.g. insider threats. The State should adopt measures and procedures to ensure that the trustworthiness of personnel is regularly revalidated.

4.11. The State should implement relevant elements of the nuclear security culture for the trustworthiness programme.

5. RECOMMENDATIONS ON DETECTION MEASURES

5.1. The State should develop a national strategy for detection of a criminal act, or an unauthorized act, with nuclear security implications involving nuclear or other radioactive material that is out of regulatory control. The detection strategy should be coordinated among and implemented by the competent authorities in accordance with the assigned responsibilities, ideally with oversight by the coordinating body.

5.2. Detection of nuclear and other radioactive material that is out of regulatory control can be achieved via an instrument alarm or an information alert. The State should design and implement nuclear security systems based on such indicators.

5.3. The State should ensure that the detection measures are supported by effective response measures (as described in Section 6).
5.4. Designated *border crossing points* are vital for commerce. Therefore, the State should consider reducing as much as possible the impact on the legitimate movement of goods and people while effectively carrying out *nuclear security measures*.

5.5. In order to prevent illegal transfer of nuclear or other *radioactive material* and detect the falsification of relevant documents, the State should ensure that *competent authorities* have the power to adopt measures for authenticating documentation and package labelling for authorized shipments and for verifying the declared content of the authorized shipment of nuclear or other *radioactive material* by appropriate means, where circumstances demand.

**Detection by instruments**

5.6. Using the national threat assessment, the *competent authorities* should establish *nuclear security systems* for *detection* by instruments of nuclear and other *radioactive material* that is out of *regulatory control*. The *detection systems* should be based on a multilayered *defence in depth* approach and on the premise that such material could originate from both within or outside the State, and provide the necessary *detection* capability and capacity.

5.7. Taking into account the prioritization of available resources, the *competent authorities* should develop an appropriate instrument deployment plan, considering the following:

- transportation routes inside the State’s territory, at locations where likelihood of *detection* is maximized or in proximity to locations where nuclear or other *radioactive material* is produced, used, stored, consolidated or disposed;
- the existence of any *strategic location*;
- operational and *detection* performance specifications of the *detection* instruments, in accordance with national and international standards and technical guidelines;
- capabilities, constraints and limitations on *detection* instruments at both officially designated and undesignated air, land and water *border crossing points*;
- mobile and relocateable *detection systems* to provide flexibility and adjustments to evolving threats;
- *detection* requirements in support of law enforcement operations associated with *information alerts*; and
- *detection of radiation* at an event of national significance, such as a *major public event* or at a *strategic location* that is considered to be vulnerable to a *malicious act* using nuclear or other *radioactive material*.

5.8. The *competent authorities* should ensure that the following elements are included in the instrument deployment plan:

- initial installation, calibration, and acceptance testing of equipment; the setting up of a maintenance procedure, and the adequate training and qualification of users and technical support staff;
- systems and procedures for conducting a *radiation survey* or a *radiation search* for nuclear and other *radioactive material* out of *regulatory control*;
- defining threshold levels of an *instrument alarm*;
- establishing systems and procedures for performing initial alarm assessment and other secondary inspection actions such as localization, identification, categorization and characterization of nuclear and other *radioactive material*, including obtaining technical support from experts to assist in the assessment of an alarm that cannot be resolved on site; and
- provision and sustainment of supporting infrastructure to ensure effective *detection*, including personnel training, equipment maintenance, safe and secure disposition of discovered material and documented *response* procedures.

5.9. In order to prevent a *malicious act* at a *strategic location*, especially during a *major public event*, the *competent authorities* should consider surveying the area for nuclear and other *radioactive material*, securing the area before such an event and applying *detection* and *response measures* at the entry points and other *strategic locations* during such events.

5.10. The *competent authorities* should develop a *nuclear security culture* and ensure that all those charged with operating *detection* instruments are deemed trustworthy, adequately trained and have sufficient skills and competency in the use of the equipment and understand the significance of any measurement that they take and what actions to take under defined circumstances.
5.11. The competent authorities should consider the policies, management practices and procedures associated with sustaining detection instrument operations. They should apply sound management systems and practices and administer a time phased programme that accounts for an evolving threat and changing resource constraints. These considerations should include the budget and staff allocation necessary to operate and sustain the detection instruments.

Information alert

Operational information

5.12. As part of the detection measures, the State should continuously gather, store and analyse operational information with the goal of identifying any threat, suspicious activity or abnormality involving nuclear or other radioactive material that may indicate the intention to commit a malicious act involving nuclear or other radioactive material within the State. The State should also cooperate with other States to provide and obtain information for better understanding of any threat.

5.13. The State should develop a policy on encouraging persons to report to the competent authorities any suspicious or unusual activity potentially involving nuclear or other radioactive material.

5.14. The competent authorities should consider developing a policy on the dissemination of information to the news media with the aim of informing the public of lost, missing or stolen nuclear or other radioactive material to educate them in the risks associated with the material and to elicit information from the public about such material, taking care not to cause undue public concern.

Medical surveillance

5.15. As part of the detection measures the State should implement procedures and protocols requiring health professionals, medical institutions and health authorities to immediately report to the relevant competent authorities, in accordance with domestic public health reporting policies, the occurrence of any suspicious radiation injuries or illnesses.

5.16. The State should include the collection and analysis of information from medical surveillance as part of detection measures and, as appropriate, any report should be investigated by relevant competent authorities to determine the cause and consequence of the injury or illness.

5.17. The State should consider including the identification of radiation injuries or illnesses as part of the training of relevant health professionals.

Reporting non-compliance

5.18. The competent authority with regulatory responsibility should require authorized persons to report immediately any non-compliance which they suspect could have nuclear security implications. Such a report would enable the competent authority to assess the event with the aim of preventing a consequent malicious act.

5.19. The competent authority with regulatory responsibility should develop procedures and protocols to assist authorized persons to report their non-compliances having nuclear security implications.

Reporting loss of regulatory control

5.20. The State should ensure that competent authorities are legally empowered to require authorized persons to immediately report lost, missing or stolen nuclear or other radioactive material for which they hold an authorization. Such a report should be regarded as detection by information of a potential criminal act, or an unauthorized act, with nuclear security implications.

5.21. The State should ensure that any competent authority that issues authorizations related to nuclear or other radioactive material, and that receives a report that such material has been reported as lost, missing or stolen, promptly inform other relevant competent authorities.

5.22. The competent authorities responsible for implementing nuclear security measures related to immigration, customs and border control should report the detection of any nuclear or other radioactive material that is not under regulatory control to other relevant competent authorities, including the regulatory body.
Initial assessment of an instrument alarm and/or information alert

5.23. An instrument alarm or an information alert should lead to the conduct of an initial assessment. The relevant competent authorities should ensure the establishment of procedures and protocols for the initial assessment of both an instrument alarm and an information alert by the designated staff and, as applicable, by other designated organizations.

5.24. Upon detection of an instrument alarm or an information alert, the relevant competent authorities should implement procedures and protocols with the view to interdict and interrupt the potential criminal act, or unauthorized act, with nuclear security implications.

6. RECOMMENDATIONS ON RESPONSE MEASURES

6.1. Using legislative instruments as necessary, the State should develop a national response system\(^6\) for responding to a criminal act, or an unauthorized act, with nuclear security implications involving nuclear or other radioactive material that is out of regulatory control.

6.2. The State should ensure that the responsibilities for implementing the various response measures are assigned to the relevant competent authorities, together with sufficient resources to effectively undertake these tasks.

6.3. The implementation of the response system of the State should be documented in a national response plan\(^7\) outlining the various response measures, and should be implemented coherently by the various competent authorities, ideally coordinated by the coordinating body.

6.4. The State should adopt a graded approach to respond to the various possible nuclear security events and differing degrees of consequences. In order to determine the appropriate response and follow-on actions, the State should strive to develop its own national capability to quickly grade nuclear security events, based on health and safety concerns and on circumstantial factors and the involved nuclear or other radioactive material.

6.5. The competent authorities should develop a nuclear security culture and assign responsibility for the execution of the national response plan to appropriately equipped and trained personnel.

6.6. For nuclear security events, the responsible competent authorities should complement and support the safety emergency response activities to mitigate and minimize the radiological consequences to human health and the environment at the international, federal, state and local levels. The coordination of competent authorities is vital for an effective response at the scene.

Assessment of instrument alarms

6.7. The competent authorities should define the roles and responsibilities of technical staff, assigned experts and support organizations who may be involved in resolving an instrument alarm, if the initial assessment is not conclusive.

6.8. The relevant competent authorities should ensure the establishment of procedures and protocols for final resolution of an instrument alarm which should result in the determination of whether or not a nuclear security event has occurred. The determination of a nuclear security event should lead to the activation of the national response plan by the relevant competent authority using a graded approach.

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\( ^6\) Response systems are integrated sets of response measures. Response comprises of two phases: - The first phase is the assessment phase which is a continuation of the initial assessment of an instrument alarm or an information alert if that initial assessment is inconclusive. The outcome of the assessment process would be the determination that a nuclear security event has occurred unless the alarm or alert is determined to be false or innocent. The second phase of the response is the management of the nuclear security event through the execution of the national response plan.

\( ^7\) In a State with the federal structure, the response may be established on federal as well as on the state level.
Assessment of information alerts

6.9. For the assessment of information alerts, the competent authorities should obtain the necessary assistance from the assigned experts and the support organizations, in accordance with the established procedures and protocols.

6.10. The assessment of information alerts should result in the determination of whether or not a nuclear security event has occurred. The determination of a nuclear security event should lead to the activation of the national response plan by the relevant competent authority using a graded approach.

Notification of a nuclear security event

6.11. Notification to the relevant competent authorities should be made as soon as the assessment of an instrument alarm or information alert results in the determination of a nuclear security event. In order to initiate their response task, the competent authorities should notify relevant competent authorities within the State of any nuclear security event taking into account the graded approach as described in 6.4.

6.12. In the case of a nuclear security event, the State should forthwith notify relevant international organizations and other States in accordance with international agreements and/or national policy, as described in 7.1 to 7.5.

Collection and handling of evidence within a nuclear security event

6.13. The location of any nuclear security event should be managed as a potential crime scene, as appropriate. The competent authorities should ensure coordination among those involved in recovering control over the nuclear or other radioactive material, those concerned with safety and treating victims and those concerned with gathering evidence for possible subsequent investigation and prosecution.

6.14. The State should apply nuclear forensic techniques to seized nuclear or other radioactive material, in its designated laboratories using a graded approach, for the purpose of identifying the source, history and the route of transfer, taking into account the preservation of evidence. Furthermore, traditional forensics should also be applied in designated laboratories for contaminated evidence, as necessary.

6.15. The competent authorities should ensure that persons involved in the response should be suitably qualified and trained and should, as appropriate, be aware of the concepts of operations and the basic concepts of radiological crime scene management, evidence collection and radiation protection.

6.16. Personnel at the crime scene should be aware of the potential for news media interest. The competent authorities should make plans for proper and timely dissemination of information to the news media, including information pertaining to safety and security.

National response plan for nuclear security events

6.17. In order to manage nuclear security events, the State should have a comprehensive national response plan for nuclear security events (the Plan) in combination with, inter alia, the national radiological emergency plan [11]. The Plan should serve as: (1) a basis for establishing compatible operational tools (e.g. compatible communication systems) needed for prompt and effective response; and (2) a guide for the competent authorities who should ensure that all necessary preparedness and response tasks are given the appropriate resources and support.

6.18. The State should ensure that the Plan:

1. describes the process for various competent authorities to fulfil their obligations and responsibilities in response to nuclear security events, including steps to:
   - notify and activate all relevant competent authorities;
   - notify the relevant international organizations and potentially affected States;
   - coordinate various organizations and command and control units of a nuclear security event, including coordination of federal, state and local response organizations;
   - locate, identify and categorize nuclear and other radioactive material;
   - detain and/or seize, recover and control material or render harmless any threat or associated device;
   - collect, secure and analyse evidence;
• isolate, classify, package and document, any nuclear or other radioactive material, for transport, carriage, storage or disposal and placement under proper regulatory control; and
• initiate relevant investigations.

2. contains an appropriate command structure with integrated command, control and communication systems to effectively respond to a nuclear security event, preferably with a single person or competent authority assigned to direct the response at the scene;

3. has provisions for coordination among the competent authorities, including exchange of relevant information concerning their respective roles, responsibilities and procedures;

4. describes the roles, responsibilities and procedures for the competent authorities for medical services, handling of hazardous material, radiation protection and safety and other technical support organizations and for nuclear and conventional forensic laboratories;

5. arranges for informing the news media and public, as appropriate, in a coordinated, understandable and consistent manner;

6. contains provisions for the transport of any seized or recovered nuclear or other radioactive material in accordance with the national transport safety and security regulations and requirements, or the IAEA Regulations for the Safe Transport of Radioactive Material [14] if there are no such national requirements or regulations;

7. identifies the standard operating procedures at the local level for nuclear security events. In addition, all local level response plans should be integrated into the Plan;

8. takes into account the existing national radiological emergency plan, radiological emergency response procedures and the relevant IAEA Safety Standards [11, 12, 13]. The Plan should also be coordinated with the arrangements for response to conventional emergencies;

9. incorporates the possibility of multiple and simultaneous nuclear security events. In addition, the Plan should incorporate the possibility of disruption of response infrastructure that would delay an effective response capability; and

10. incorporates the mechanisms for requesting assistance, both domestically and internationally, when necessary, such as assistance for the recovery of nuclear and other radioactive material, rendering harmless the device and nuclear forensics.

**Preparedness**

6.19. The competent authorities should ensure the preparedness of the nuclear security response resources, including the availability of appropriate procedures.

6.20. The State should periodically review, exercise and revise the Plan, incorporating the relevant lessons learned, as appropriate, or whenever there are changes that could impact the Plan.

6.21. The State should exercise the Plan for credible scenarios. Competent authorities should perform exercises and drills at regular intervals, in order to evaluate the effectiveness of the Plan. When possible, States should consider participating in regional and international exercises and drills.

6.22. The competent authorities should ensure sustainability of the response equipment through a robust maintenance programme which should include periodic preventive maintenance, testing and calibration.

6.23. The competent authorities should ensure the availability of human resources and their training. Particular attention should be given to training of appropriate personnel and testing in:

• procedures to be followed in response to a nuclear security event;
• use of instruments for response activities;
• identification, safe handling, recovery and packaging of nuclear and other radioactive material;
• crisis management and communications;
• radiological crime scene management, the implications of the presence of nuclear and other radioactive material on traditional crime scene management and forensic rules of evidence;
• radiation protection of response personnel;
• identification of radiation injuries; and
• procedures for providing information to the public and news media.
6.24. The competent authorities should consider the possibility of simultaneous and other ongoing events and the analysis of all available information for assessing the related threats. The competent authorities should ensure the availability of sufficient resources to respond to multiple nuclear security events involving nuclear and other radioactive material.

7. RECOMMENDATIONS ON INTERNATIONAL COOPERATION

Exchange of information on nuclear security events

7.1. States should exchange accurate and verified information on nuclear security events in accordance with international obligations and national laws, taking into account information security measures described in 4.5 to 4.9. States should identify and make known to each other directly or through the IAEA, the UN, or other international organizations, as appropriate, their points of contact for response to nuclear security events.

7.2. The State should inform the appropriate international organizations of cases of nuclear security events involving nuclear or other radioactive material or seizures thereof in accordance with its international obligations and national legislation.

7.3. The State should provide information concerning any loss of control over nuclear or other radioactive material, or any other nuclear security events, with potential transboundary effects, to potentially affected States through bilateral or multilateral mechanisms.

7.4. The State should participate in and report relevant nuclear security events to applicable regional and international information databases in accordance with its international obligations and national legislation. One example is the IAEA’s Illicit Trafficking Database (ITDB).

7.5. The State should consider exchanging information on lessons learned after relevant nuclear security events.

Technical cooperation and assistance

7.6. On request and in compliance with information security requirements, States should consider exchanging functional and technical specifications and performance data of instruments for the purpose of enhancing another State’s detection and response capabilities. They should develop protocols and procedures for such information exchange and consider development of common data formats.

7.7. The State should promote the cooperation of its customs and other border authorities with those of other States, including at land border crossing points, seaports and airports. States could consider coordinating or sharing detection capabilities and expertise at designated and undesignated border crossing points.

7.8. States should consider enhancing preparedness by conducting or participating in joint exercises and training events related to nuclear security at the international, regional and national level, and by coordinating respective national response plans, as appropriate.

7.9. The State should consider providing assistance including expertise and equipment, upon request by another State, for example for major public events requiring nuclear security measures.

7.10. The State should consider requesting assistance from other States and international organizations to improve its technical capabilities for detection and response. The State should also consider requesting assistance during nuclear security events.

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8 The relevant international organizations include inter alia UN, IAEA, International Criminal Police Organization (INTERPOL), EUROPOL, WHO, WCO and IMO. For example, criminal information and relevant events should be reported to INTERPOL via INTERPOL National Central Bureau (NCB).
Cooperation with respect to criminal offences

7.11. States parties to relevant bilateral and multilateral instruments should use, where applicable within the framework of national laws, the mutual legal assistance and other provisions in such instruments to provide effective cooperation in connection with criminal proceedings related to nuclear security events.

7.12. States should provide each other legal assistance in connection with investigation proceedings in accordance with international obligations and national laws.

Recovery and return of seized items

7.13. The State that has located, seized, recovered or otherwise obtained nuclear or other radioactive material that is out of regulatory control should safely and securely store the material and then, where appropriate, work with the State in which regulatory control had been lost to arrange for the safe and secure return of the material. Actions taken by States holding the material should be consistent with their national policies, procedures and with applicable bilateral and multilateral arrangements.

7.14. Upon detection of nuclear or other radioactive material out of regulatory control at a border crossing point, the State should work with the State of origin and other relevant States to return the material to regulatory control. The State should adopt a graded approach for such response that depends on the circumstances of the case and the nature of the material.

Nuclear forensics cooperation

7.15. The State should apply nuclear forensics techniques to determine the source and route of transfer and to investigate loss of regulatory control. Investigations may entail cooperation between or amongst States to identify the origin, history and the route of transfer of the nuclear or other radioactive material. Cooperation on nuclear forensics should be subject to the State’s domestic laws, regulations and policies.

7.16. The State should assess its capabilities to perform nuclear forensics and the potential needs for forensics support. States without sufficient nuclear forensics expertise and capabilities are encouraged to enter into arrangements with other States or relevant regional or international institutions for the purpose of nuclear forensics analysis and interpretation. They should also consult with the IAEA, which can facilitate obtaining nuclear forensics assistance. In particular, the arrangements may include:

- means and procedures for transfer of samples of nuclear or other radioactive material or items from the requesting State and into the territory of the assisting State or to assisting multinational institutions;
- measures to preserve evidence to ensure its legal validity in accordance with the requesting State’s domestic laws, regulations and protocols regarding rules of evidence;
- procedures for return of samples, including responsibilities of the involved States and the State in which loss of regulatory control occurred;
- disposal of sample residues and analytical wastes;
- authorization of and limitations on forensics experts to access potentially restricted facilities and information;
- provisions regarding the appropriate notification of national authorities and international organizations with respect to the results of the forensic analysis;
- provisions on confidentiality of information and non-disclosure;
- provision of written or oral expert testimony regarding the forensic examinations that were conducted and the conclusions reached as a result of such examinations; and
- national level points of contact to be used by a State in requesting support on nuclear forensics.

7.17. The State should consider establishing nuclear forensics libraries for their inventory of nuclear and other radioactive material. These libraries should include databases of all material produced, used and stored in the State and, if applicable, supported by sample and literature archives. The State should be capable of responding to queries of other States regarding recovered nuclear or other radioactive material that may have been produced, used or stored on the State’s territory. Information security should be evaluated and appropriate measures taken when establishing a nuclear forensics library, according to national laws and regulations.
REFERENCES