IAEA NUCLEAR SERCURITY SERIES No. XX-T

NST066

DRAFT

Step 8: Soliciting comment by Member States

Dated: 4 June, 2024

Developing an Operator's Response Plan for Radioactive Material in Use and Storage and for Associated Facilities

DRAFT TECHNICAL GUIDANCE

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 20XX

CONTENTS

1. INTRODUCTION

BACKGROUND

1.1. IAEA Nuclear Security Series No. 20, Objective and Essential Elements of a State's Nuclear Security Regime [1] establishes the objectives of a nuclear security regime and its essential elements. Essential Element 11 in Ref. [1], states that "A nuclear security regime ensures that relevant competent authorities and authorized persons are prepared to respond, and respond appropriately, at local, national, and international levels to nuclear security events."

1.2. Recommendations to ensure an effective nuclear security regime can be found in IAEA Nuclear Security Series Nos 13, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5) [2], 14, Nuclear Security Recommendations on Radioactive Material and Associated Facilities [3], and 15, Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control [4].

1.3. IAEA Nuclear Security Series No. 37-G, Developing a National Framework for Managing the Response to Nuclear Security Events [5] addresses the development, implementation, maintenance and sustainability of a national framework. While Ref. [5] provides the basis for managing the response to nuclear security events through the development of a national framework, it does not provide information on developing and maintaining response plan at the operator level.

1.4. IAEA Nuclear Security Series Nos 11-G (Rev. 1), Security of Radioactive Material in Use and Storage and of Associated Facilities [6], and 43-T, Security Management of Radioactive Material in Use and Storage and of Associated Facilities [7] provide further information on the implementation of Ref. [3].

1.5. This publication supplements Refs [6] and [7] and provides detailed information on developing and maintaining an operator's response plan[1] to respond to a nuclear security event involving radioactive material.

1.6. The concept and structure of this publication is based on IAEA Nuclear Security Series No. 39-T, Developing a Nuclear Security Contingency Plan for Nuclear Facilities [8].

OBJECTIVE

1.7. The objective of this publication is to provide guidance to States, competent authorities, operators and response organization on developing and maintaining the operator level response plan for nuclear security events involving radioactive material in use and storage and for associated facilities. It can be used as a basis for operators that have not yet developed a response plan, as well as for operators that wish to validate or improve their existing response plans.

1.8. Guidance is also provided in this publication on the interface between the operator's response plan and the emergency plan, which is developed in accordance with the requirements provided in IAEA Safety Standards Series No. GSR Part 7, Preparedness and Response for a

[1] For the purpose of this publication, 'operator's response plan' is used to refer to the operator level response plan developed to respond nuclear security events involving radioactive material in use and storage.

Nuclear or Radiological Emergency [9]. This guidance is intended to inform the preparation of an effective, comprehensive, unified and coordinated response in situations where both the operator's response plan and emergency plan are invoked simultaneously, for example, when a nuclear security event triggers a radiological emergency.

SCOPE

1.9. The guidance provided in this publication applies to nuclear security events involving radioactive material in use and in storage and for associated facilities. For example, it can be applied to hospitals using radioactive material, irradiation facilities, industrial facilities using gamma radiography, fixed and mobile industrial gauges that incorporate high activity radioactive sources, and storage facilities for radioactive material. More details on radioactive sources used for common applications can be found in Ref. [6].

1.10. As used in this publication, radioactive material includes radioactive sealed and unsealed sources under regulatory control, including radioactive material over which regulatory control has been gained or regained. The response to nuclear security events involving radioactive material that could be located at a nuclear facility, and covered by the nuclear facility's security contingency plan, are outside the scope of this publication. Information on nuclear security contingency plans for nuclear facilities can be found in Ref. [8].

1.11. Nuclear security events can include criminal or other intentional unauthorized acts involving or directed at radioactive material (e.g. unauthorized removal of radioactive material or the sabotage of an associated facility). Not all nuclear security events call for the implementation of the response plan and the actions of a response force, for example detection of inadvertent access to the location where radioactive material is present. This Technical Guidance considers nuclear security events that involve the initiation of the operator's response plan and the actions of the designated response force[2]. The operator's response plan describes actions that complement and align with those outlined in the respective State level response plan(s).

1.12. The State response plan (also called the national response plan) is outside the scope of this publication. Information on developing a national framework for managing the response to nuclear security events can be found in Ref. [5].

1.13. The response to computer security incidents or to nuclear security events that occur during transport are not addressed in this publication. These types of nuclear security events are addressed in IAEA Nuclear Security Series Nos 42-G, Computer Security for Nuclear Security [10] and. 9-G (Rev.1), Security of Radioactive Material in Transport [11], respectively.

STRUCTURE

1.14. Section 2 of this publication provides information on developing an operator's response plan, which includes establishing the goals of such a plan. Section 3 focuses on maintaining the response plan and includes information on training, exercises and the sustainability of the response plan. Section 4 addresses special considerations for mobile sources within the

[2] For the purpose of this publication, 'designated response force' is used to describe the off-site response force engaged by the operator to respond to nuclear security events involving radioactive material in use and storage and associated facilities. The operator can have on-site response or obtain off-site response services from law enforcement, the military or private security organizations, as appropriate.

operator's response plan, which could include temporary storage at off-site locations. Annex I addresses the interface between the response plan and the emergency plan at the operator level. Annex II offers an example of a memorandum of understanding between operator and the designated response force, and Annex III provides an example of an implementing procedure for responding to unauthorized access to radioactive material.

2. DEVELOPING AN OPERATOR'S RESPONSE PLAN

2.1. Paragraph 3.33 of Ref. [3] states that "The regulatory body should ensure that the operator's security plan includes measures to effectively respond to a malicious act consistent with the threat." Reference [6] states that "The response plan could be prepared as part of the security plan or as a separate document."

2.2. The purpose of the response plan is to prepare the operator and designated response force personnel for the actions that would be necessary to respond to nuclear security events. After confirming a nuclear security event, immediate actions would include the following: (1) notification of the nuclear security event to, and coordination with, the designated response force; and (2) implementation of on-site response procedures (e.g. locking entry and exit doors, evacuating personnel).

2.3. When developing the response plan, the operator should coordinate with the designated response force and relevant national authorities. The process for coordination with the designated response force and relevant national authorities for detailed information on the facility should be clearly described in the response plan. At a minimum, this information should include details on the radioactive material (e.g. type, activity, location), the associated hazards, facility layout(s), and the relevant security measures for the protection of the radioactive material.

2.4. The operating conditions of the facility, and the stage in the life cycle of the radioactive material (e.g. use, maintenance, source replacement, storage) should be taken into account in the response plan. The response plan should also cover the response actions associated with these operating conditions and stages.

2.5. The response plan should include relevant procedures for use and implementation in the case of initiation of the plan. These procedures should include the means and frequency of communication between the operator, the designated response force, other relevant competent authorities responsible for response to nuclear security events and emergency workers in case the nuclear security event triggers radiological emergency. These procedures should also include flow charts for communications and clearly define the means of coordination and assistance provided by the operator to the designated response force and emergency workers arriving on-site.

2.6. The response plan, and other documents relating to the security of radioactive material (e.g. inventory of radioactive material at the facility, facility security plan, plans for on-site movement of radioactive material or for transport of radioactive material), will contain sensitive information that should be protected in accordance with the information security requirements of the State. Sensitive information contained in the response plan should be accessible only to the personnel who need the information to implement their roles with regard to the response plan. Detailed guidance on these requirements is provided in IAEA Nuclear Security Series No. 23 G, Security of Nuclear Information [12].

DEVELOPING THE GOALS OF A RESPONSE PLAN

2.7. The goals of the response plan for a nuclear security event involving radioactive material in use and storage are outlined in Ref. [3]. To provide an effective and integrated response to a security event, it is essential to address the level of threat as outlined in the threat statement and to detail the arrangements for coordination with facility and operating personnel, the designated response force, and the competent authority.

2.8. More, specifically, paragraph 4.1 of Ref. [3] states:

> "With the aim of preventing a *malicious act*, security measures should be designed to:
>
> …….
>
> — Allow rapid assessment [of] any *nuclear security events* to enable appropriate response initiation and to allow recovery or mitigation efforts to start as soon as possible;
>
> — Provide for rapid response to any attempted or actual unauthorized access to *radioactive material*, or to other *nuclear security events* involving *radioactive material*."

2.9. Paragraph 4.13 of Ref. [3] states:

> "Response measures should be implemented following detection and assessment. The *operator* should be required to make appropriate arrangements to communicate with law enforcement personnel following detection and assessment in order that they may perform the response. In implementing a *graded approach*, the objectives of response measures could range from providing immediate response with sufficient resources to interrupt *malicious acts* to providing alarm notification to allow the appropriate authority to investigate the event."

2.10. Paragraph 4.14 of Ref. [3] states that "The *operator* should cooperate with and assist the *competent authorities* as appropriate in their efforts to locate and recover the *radioactive material*, including cooperation in on-site and off-site response."

2.11. To accomplish these goals, the response plan should specify at least the following:

(a) The roles and responsibilities of the competent authority, the operator and the designated response force.

(b) The sequence of actions that need to be undertaken in response to a nuclear security event and emergency actions where the nuclear security event triggers radiological emergency, for example, detection of emergency conditions, response activation, taking mitigatory actions and communication including procedures for informing the competent authorities that a response to a nuclear security event is underway;

(c) The resources needed to implement the response to a nuclear security event, including, where necessary, arrangements for requesting additional resources if the designated response force needs further support and when a nuclear security event triggers emergency plan;

(d) Arrangements for the management of crime scenes, including radiological crime scenes, at which a criminal or other intentional unauthorized act involving radioactive material has taken place or is suspected;

2.12. To ensure a cohesive and coordinated response, the response plan should be consistent with the operator's security plan, emergency plan[3] and related procedures. The response plan should also provide a basis for the training of the operating personnel of the facility or activity, and the personnel of the designated response force.

ELEMENTS OF THE RESPONSE PLAN

2.13. The response plan should include the following elements:

(a) The objective of the response plan (see para. 2.15);
(b) The layout of the facility (i.e. schematic arrangements of parts and areas), the environment surrounding the facility and potential targets within the facility (see paras 2.16–2.19);
(c) An overview of security system of the facility (see para. 2.20);
(d) Consideration of the threat statement (see para. 2.21);
(e) Description of roles and responsibilities (see paras 2.22– 2.36);
(f) Criteria for the initiation and termination of the response plan (see paras 2.37–2.38);
(g) Description of the arrangements for crime scene management, including radiological crime scenes resulting from a nuclear security event (see para. 2.39);
(h) Constraints in the implementation of the response plan (see para. 2.40);
(i) Information on the designated response force (see paras 2.41–2.44);
(j) Command, control and communication during a nuclear security event (see paras 2.45–2.49).

Objective of the response plan

2.14. The response plan should clearly address the objective of the response plan explicitly tailored to the facility type or radioactive material involved in a potential nuclear security event. The development of the response plan objective should consider adapting graded approach that ranges from providing immediate response with sufficient resources to interrupt malicious acts, to simply providing an alarm notification to the relevant entities based on the level of risk involved.

Layout of the facility

2.15. The response plan should include a description of the layout of the facility and the potential targets within it, as well as the environment surrounding the facility and any other features that could influence response actions. Information on the layout should be concise and should include images, layouts and schematics, to the extent possible, supplemented by minimal text so as to quickly communicate information that will be useful to response personnel.

2.16. Descriptions of the facility and potential targets within the facility should detail the physical structures, relevant physical barriers, radioactive material, associated risks and hazards, other on-site hazardous material storage areas, significant systems and components, the location of switches and valves to disable utilities, and other features and areas of interest for response planning.

[3] For more information on the emergency plan, see GSR Part 7 [9].

2.17. The description of the local environment should include information about nearby structures, roads, railways and waterways, pipelines, airports, other hazardous material facilities and pertinent environmental features that might affect the coordination of response actions. The main and alternate entry routes for the designated response force should be described in the plan, and maps should be included, as appropriate [8].

2.18. The operator should specify any areas of the facility that need additional protection, such as rooms in which sensitive equipment (e.g. security servers, ventilation systems, power breakers, backup power, communications equipment, essential safety equipment) is located, along with the potential adversary routes to these areas of the facility.

Overview of security system of the facility

2.19. Security measures that could impact the response to a potential nuclear security event should be described in the response plan, including any compensatory measures to be employed. Some elements of the security system that could be included are descriptions of the location of cameras, intrusion sensors, delay elements, locks and access control locations, and any means of communicating and monitoring alarms and videos. This information should be protected in accordance with the requirements for the protection of information included in the security system.

Consideration of the threat statement

2.20. The threat statement should be considered during the development of the response plan. The plan should consider potential scenarios for nuclear security events that would necessitate action on the part of the designated response force. These scenarios should include credible adversary scenarios based on the threat statement, such as unauthorized removal of radioactive material from the site or sabotage.

Description of roles and responsibilities

2.21. The response plan should clearly indicate the roles and responsibilities of the operator, the designated response force and other local or national organizations involved in responding to nuclear security events, as defined by the State and any inter-agency agreements.

2.22. The operator might not be capable of responding to a nuclear security event using its own means, the operator will often rely on an external response force. The State can identify the entity (or entities) that are permitted to provide such response. The operator should establish arrangements with the designated response force to ensure immediate deployment of response personnel upon notification of a potential nuclear security event.

2.23. Annex II presents an example of a memorandum of understanding between the operator and the designated response force, which outlines, inter alia, the roles and responsibilities specific to the tasks necessary to execute the response plan during a nuclear security event.

Competent authority

2.24. The competent authority should establish requirements through regulations for the development of operator's level response plan and should identify the associated requirements that operators would be required to meet in order to be in compliance with these regulations.

2.25. Where appropriate, the responsible competent authority should facilitate interaction between the operator and the designated response force to ensure effective coordination in the development and implementation of the response plan.

2.26. The response plan should be reviewed and approved by the competent authority (see para. 3.27 of Ref. [2]). As part of the authorization process, the competent authority should verify that the operator provides sufficient evidence to confirm that the response plan was prepared in accordance with the requirements of the operator's level emergency plan in order to ensure that both of these plans are integrated and provide an effective, overall response. The competent authority's review of the response plan should also check whether there are adequate arrangements for coordination among the designated response forces that enables an appropriate and timely response to a nuclear security event.

2.27. Another important factor to be verified by the competent authority is that the actions specified in the operator's level response plan are complementary to, and consistent with, the State level response plan or other national plans. A nuclear security event at the facility that might have off-site consequences, should be managed in a manner that ensures proper coordination between response forces in order to consider all the organizations likely to be involved in such a response, including multiple competent authorities that have responsibilities relating to nuclear safety and security.

Operator

2.28. The operator has the overall responsibility for the development and maintenance of the response plan, following a coordinated and integrated approach that considers all the organizations, including competent authorities and other local or national authorities involved in the response.

2.29. The operator should collaborate with the designated response force during the development of the response plan. Collaboration should include information sharing, site visits, technical support and training for the designated response force personnel.

2.30. The operator should ensure coordinated response in situations where both the operator's response plan and emergency plan are invoked simultaneously, for example, when a nuclear security event triggers a radiological emergency. Annex I present more information on the establishment and use of such unified command control system.

Designated response force

2.31. The response force should be designated in accordance with national regulatory requirements. The designated response force and the operator should establish a formal arrangement (e.g. a contract or memorandum of understanding), which identifies the designated response force that will intervene during a nuclear security event. The purpose of such an arrangement is to facilitate cooperation and understanding between the operator and the response force, and to address specific issues, such as the sharing of sensitive information. Since the operator and designated response force could be overseen by different competent authorities, all these competent authorities might need to be involved in facilitating the development of the formal arrangement.

2.32. The designated response force should participate in the development, implementation and evaluation of the response plan. The appropriate personnel from the designated response

force should be selected to participate in the development of the plan. Those selected should participate in site visits that are designed to familiarize the personnel with the facility and with radiation hazards.

2.33. The designated response force should determine the capabilities, the appropriate number of response personnel and the equipment that will be needed to respond to nuclear security events on the basis of the threat statement, the facility layout and the radioactive material present on-site.

2.34. The designated response force should provide support for, collaborate in the conduct of, and participate in exercises to test the adequacy of the response plan on regular basis.

2.35. The designated response force should develop specific internal procedures consistent with the response plan developed in coordination with the operator. The designated response force should provide a point of contact to whom immediate notification will be made by the operator in the case of a potential nuclear security event.

Criteria for the activation and termination of the response plan

2.36. Activation of the response plan is triggered by the detection of a nuclear security event that puts the facility at risk in such a way that it could: (1) lead to unacceptable radiological consequences or unauthorized access and unauthorized removal of radioactive material; and (2) necessitate action on the part of the designated response force. Examples of such events include detection of unauthorized access to radioactive material, attempted unauthorized removal of radioactive material, or the discovery of potential damage to systems.

2.37. Termination of the response plan would occur when the facility is authorized to return to normal operating conditions. This could be achieved through neutralization of an adversary or confirmation that the facility is no longer considered to be at risk.

Description of the arrangements for crime scene management, including radiological crime scenes resulting from a nuclear security event

2.38. The response plan should describe arrangements for the identification of, and management of, crime scenes, including, where appropriate, radiological crime scenes, after the initial response actions to a nuclear security event. Taking the safety of response personnel in to consideration; these arrangements should ensure that evidence relating to the nuclear security event can be collected, secured and preserved in accordance with national requirements concerning evidential integrity and chain of custody, in an effort to support any investigation that might ensue.

Constraints in the implementation of the response plan

2.39. The response plan should describe legal and other constraints that might affect the response to a nuclear security event. Some examples include possible restrictions on the use of force, limits of jurisdiction for the designated response forces, other administrative and logistical requirements for response personnel, such as the availability and functionality of equipment and other necessary resources for response.

Information on the designated response force

2.40. The role and actions of the designated response force should adhere to the general conditions agreed in the contract or memorandum of understanding.

2.41. The following are specific to the designated response force and should be considered in the response plan:

(a) Ensuring the availability of adequate resources at the time of a nuclear security event;
(b) The variability in the response times, depending on the location of the designated response force when the plan is initiated;
(c) Communication protocols between the operator and response personnel;
(d) Familiarity of response personnel with the facility;
(e) Awareness of response personnel with radiation exposure and protection during response;
(f) Familiarity of response personnel in responding to criminal or other intentional unauthorized acts involving nuclear or other radioactive material.

2.42. The appropriate resources for the designated response force should be identified during the planning process. Any additional response support that might be needed for a nuclear security event involving extended adversary engagement or potential complications should also be identified during the planning process. Considerations for the logistics of staging and life cycle management of these resources should also be included as part of the planning process.

2.43. Provisions should also be included in the response plan to ensure that the designated response force is appropriately equipped for the full range of credible scenarios that have been included in the plan, on the basis of the threat statement. This equipment could include weapons systems, and personal protective equipment for safety and security purposes, as well as communications, transport and other response equipment.

Command, control and communication during a nuclear security event

2.44. Command and control procedures should be well documented and should include identification of the chain of command to be observed during a nuclear security event at the operator level including the nuclear security events that results the initiation of emergency plans. The command and control system should also consider development of procedures and protocols that are to be applied for the smooth handover of command and control as an event escalates beyond the operator's level and warrants response from other multi-agencies that have responsibilities under the national emergency and response management system.

2.45. Such procedures should clearly identify the steps to be taken and decisions to be made and recorded by the designated response force, following the initiation of the response plan. In this way, a coordinated command and control effort is ensured.

2.46. Communication protocols between on-site facility personnel and the off-site designated response force should also be established to assist the response force when arriving on-site and to ensure that response actions are well coordinated. Where possible, secure and diverse communication methods and supplementary information security measures should be implemented to ensure availability and confidentiality of information.

2.47. Communication protocols should be tested at regular intervals, and procedures should be documented regarding the interoperability of radio communication between on-site facility personnel and the designated response force. Facility personnel radio communication equipment maybe incompatible with those of the designated response force and other response entities due to secured frequencies or encryption. Compatible communication devices and systems should be used or alternate arrangements such as separate radio communication system should be considered.

2.48. Command, control and communication procedures for response plans should be coordinated with those procedures outlined in the emergency plan so as to allow for an effective response in situations where both plans are invoked simultaneously. Annex I present more information on interface of the response plan and emergency plan, as well as, the establishment and use of unified command control system. More guidance on command and control can be found in the IAEA Nuclear Security Series No. 37-G, Developing a National Framework for Managing the Response to Nuclear Security Events [5].

3. MAINTAINING THE RESPONSE PLAN

3.1. In order to assess the efficiency of the response plan, provisions should be established for the review and testing of the plan, and for the conduct of exercises in relation to all aspects of the response plan. These provisions should be documented in operator's and the designated response force procedures.

TRAINING AND EXERCISES

3.2. Once the response plan is in place, training and exercises should be used to prepare, evaluate and improve the ability of the operator, the designated response force and any other external, supporting response services to implement the plan. The process for conducting training and exercises should be jointly developed by the operator and the designated response force.

3.3. The operator, the designated response force and any other external, supporting response services should ensure that all personnel involved in the response to a nuclear security event receive initial and periodic training concerning the response plan. Operator personnel should participate in exercises designed to prepare them for their specific roles and responsibilities in the case of a nuclear security event, as outlined in the response plan.

3.4. Training should entail a review of all of the actions that should be undertaken by the operator and on-site personnel in response to a nuclear security event. Such actions could include locking doors, barricading vehicle access, designating a shelter on-site and evacuating occupants. Training provided by the operator should also include a description of support to the designated response force, such as sharing information, assisting with the identification of locations where radioactive material is used or stored, and escorting response personnel on the site.

3.5. The designated response force should receive training on radiation hazards and protection measures. When appropriate, it is the operator that should provide this training. It is important for the designated response force to gain familiarity with the facility and the target locations in order to understand the potential radiological consequences of response actions.

3.6. Training for facility personnel and the designated response force could include classroom lectures, e-learning courses, table-top exercises, demonstrations, videos, and facility tours and briefings designed to familiarize the personnel with the facility. In addition to training, the operator should ensure that technical information and relevant advice to support a response involving radioactive material can be provided to the designated response force, when needed.

3.7. Exercises relating to the response plan could include tabletop exercises, limited scope performance testing, simulation exercises, drills, and force on force exercises that may need engaging multiple response entities. The objective of such exercises is to demonstrate responder actions during a simulated nuclear security event in an effort to evaluate the effectiveness of the various components of the response plan.

3.8. The operator and the designated response force should develop an evaluation process to identify lessons from the training and exercises, incorporating these lessons into a corrective action programme to further improve and refine the response plan.

3.9. For example, the operator and the designated response force should document all drills and exercises, drafting a post-exercise report in which participants identify good practices, areas for improvement, deficiencies or other findings in relation to performance, capacities, plans, procedures, protocols, equipment or strategies. If an issue is identified as constituting a problem, the operator and the designated response force should collaborate on resolving the issue in a timely manner. Such issues should be protected as sensitive information and communicated only on a need-to-know basis, consistent with information security requirements imposed by the competent authority. Detailed guidance on these requirements is provided in IAEA Nuclear Security Series No. 23-G, Security of Nuclear Information [12].

3.10. Joint exercises involving response and emergency plans, which would involve off-site organizations, should also be undertaken to verify coordination between the two plans, and to identify improvements and strengthen coordination.

3.11. The ability of the operator personnel and the designated response force personnel to implement the response plan could be evaluated on the basis of their performance evaluation of assigned tasks, knowledge of the topics, for instance in terms of the implementation of procedures; the facility layout and operation, potential targets, the security system and defence-in-depth measures; threats to the facility; response equipment; and response positions and timelines.

SUSTAINABILITY OF THE RESPONSE PLAN

3.12. The response plan and relevant protocols, such as any memorandum of understanding between the operator and the designated response force, should be reviewed at regular intervals, or as necessary, to ensure that they remain relevant.

3.13. The response plan should be updated in a timely manner after changes in roles and responsibilities, procedures, equipment, the threat environment or the facility's physical arrangements. Revisions to the response plan should be submitted to, and approved by, the relevant competent authorities, as required. The plan should remain compatible and interoperable with other plans and procedures that are to be adhered to by the operator. Adequate human, technical and financial resources should be allocated for sustainability of the response plan.

4. RESPONSE PLAN FOR MOBILE RADIOACTIVE SOURCES

4.1. Special consideration should be given to radioactive material that is mobile for operational use. An industrial radiography device, for example, could be used daily at various work sites, and this mobility could increase the device's vulnerability. Guidance on the security of mobile sources is provided in Ref. [6]. Detailed guidance on security in the transport of radioactive material is provided in Ref. [11].

4.2. The radioactive sources used in field applications (e.g. industrial radiography, well logging) are typically contained in small devices designed for portability. These devices are frequently moved between job sites and are often used in remote locations. The ease with which the devices can be handled and concealed, and their presence in vehicles outside secured facilities, makes them vulnerable to unauthorized removal.

4.3. It is therefore important to either include mobile sources as an integral part of the facility response plan. When possible, the designated response force should be included in the preparation of any applicable response plan for mobile sources.

4.4. Response plans for mobile sources should address the same elements identified in para. 2.14, as applicable. Operators and all other personnel who are involved in the use of mobile sources should be appropriately trained and prepared to initiate the response plan in the case of a nuclear security event.

4.5. When appropriate, the response plan for mobile sources should address the process for communicating with multiple response forces while in transit. The process for notifying the appropriate response force in the case of a nuclear security event involving radioactive sources that are used and stored at off-site locations should also be addressed in the response plan for mobile sources.

5. REFERENCES

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Objective and Essential Elements of a State's Nuclear Security Regime, IAEA Nuclear Security Series No. 20, IAEA, Vienna (2013).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), IAEA Nuclear Security Series No. 13, IAEA, Vienna (2011).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Recommendations on Radioactive Material and Associated Facilities, IAEA Nuclear Security Series No. 14, IAEA, Vienna (2011).

[4] EUROPEAN POLICE OFFICE – EUROPOL, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL CIVIL AVIATION ORGANIZATION, INTERNATIONAL CRIMINAL POLICE ORGANIZATION – INTERPOL, UNITED NATIONS INTERREGIONAL CRIME AND JUSTICE RESEARCH INSTITUTE, UNITED NATIONS OFFICE ON DRUGS AND CRIME, WORLD CUSTOMS ORGANIZATION, Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control, IAEA Nuclear Security Series No. 15, IAEA, Vienna (2011).

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Developing a National Framework for Managing the Response to Nuclear Security Events, IAEA Nuclear Security Series No. 37-G, IAEA, Vienna (2019).

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Security of Radioactive Material in Use and Storage and of Associated Facilities, IAEA Nuclear Security Series No. 11-G (Rev. 1), IAEA, Vienna (2019).

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Security Management of Radioactive Material in Use and Storage and of Associated Facilities, IAEA Nuclear Security Series No. 43-T, IAEA, Vienna (2022).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Developing a Nuclear Security Contingency Plan for Nuclear Facilities, IAEA Nuclear Security Series No. 39-T, Vienna (2019).

[9] FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL CIVIL AVIATION ORGANIZATION, INTERNATIONAL LABOUR ORGANIZATION, INTERNATIONAL MARITIME ORGANIZATION, INTERNATIONAL CRIMINAL POLICE ORGANIZATION – INTERPOL, ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, PREPARATORY COMMISSION FOR THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, UNITED NATIONS OFFICE FOR THE COORDINATION OF HUMANITARIAN AFFAIRS, WORLD HEALTH ORGANIZATION, WORLD METEOROLOGICAL ORGANIZATION, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna (2015).

[10] INTERNATIONAL ATOMIC ENERGY AGENCY, Computer Security for Nuclear Security, IAEA Nuclear Security Series No. 42-G, IAEA, Vienna (2021).

[11] INTERNATIONAL ATOMIC ENERGY AGENCY, Security of Radioactive Material in Transport, IAEA Nuclear Security Series No. 9-G (Rev. 1), IAEA, Vienna (2020).

[12] INTERNATIONAL ATOMIC ENERGY AGENCY, Security of Nuclear Information, IAEA Nuclear Security Series No. 23-G, IAEA, Vienna (2015).

Annex I

INTERFACE OF THE RESPONSE PLAN AND EMERGENCY PLAN

I–1. This annex describes areas where potential interfaces could exist between the operator level response plan and the emergency plan. The paragraphs below highlight a primary interface area and include supporting examples.

I–2. Each State follows its own approach in managing the interface between emergency and response plans. The government ensures that arrangements are established between the operator and competent authorities at the local, regional and national levels, and where appropriate, at the international level [I-2] for the coordination of preparedness and response for a nuclear or radiological emergency.

I–3. The simultaneous implementation of the operator level response plan and the emergency plan would entail the implementation of a coordinated response by response personnel, personnel responsible for the radioactive material inventory and control, emergency workers and safety personnel. The response plan and the emergency plan are thus both comprehensive and complementary.

This annex is based on annex I to IAEA Nuclear Security Series No. 39-T, Developing a Nuclear Security Contingency Plan for Nuclear Facilities [I–1].

Facility design features

I–4. The operator should recognize safety–security interface issues and manage them appropriately during normal operations as well as during emergencies. [I–3]. The list below provides some examples of the facility design features, where an interface could exist between response planning and emergency planning:

(a) The physical layout of the facility and the local environment (e.g. demographics and topography);
(b) Safety related equipment and radioactive material requiring protection against unauthorized removal or sabotage, based on a graded approach;
(c) The location and protection of emergency response facilities and alarm stations;
(d) The design of fire safety features (e.g. fire doors, suppression systems);
(e) Emergency evacuation routes, access routes and assembly areas, including the physical barriers along these routes;
(f) Coordination of changes to the layout or the design of a facility, which could impact the security or emergency response.

Plans and procedures

I–5. The response plan and the emergency plan each need to take into account security requirements and safety requirements, respectively. Therefore, it is important to ensure a measure of consistency between the response plan and the emergency plan, particularly in the following areas:

(a) Plans need to be comprehensive and consistent;
(b) Off-site emergency and response plans, procedures and assets need to be coordinated and integrated with on-site security and emergency response (e.g. access control, on-site protection).

(c) Appropriate number of security personnel need to be available to support emergency response while maintaining adequate security;
(d) The contract or memorandum of understanding between the operator and the off-site response organization(s) needs to be consistent with both the emergency plan and the response plan.

Organizational structure

I–6. Roles and responsibilities of response organizations (see Ref. [I–4]) are identified to accomplish the following:

(e) Define a coordinated response, including for decision making;
(f) Respond with an appropriate number of qualified personnel, with relevant and appropriate equipment, and within the defined timelines;
(g) Identify competing priorities (e.g. multiple assignments, unavailability) for response personnel during an emergency response.

I–7. The establishment and use of a unified command and control system for security and emergency response provides effective coordination and integration between the on-site and off-site response. Some characteristics of this unified command and control system could include the following:
(a) The establishment and use of a unified command and control system providing access to real-time information to all participating entities, as this information may change with the progression of the nuclear security event.
(b) Assurance of clearly defined (on-site and off-site) authority and responsibility.

Coordination of the response plan and emergency plan

I–8. The elements listed below would contribute to coordination between the response plan and the emergency plan [I–4], particularly with respect to on-site activities that ensure protection from all hazards, including radiological hazards:

(a) Establishing activation criteria that could be different in the case of the response plan versus the emergency plan;
(b) Ensuring the safe movement of the emergency workers who are required to perform the required actions;
(c) Coordinating safety and security measures for on-site personnel;
(d) Ensuring the emergency evacuation of personnel, as prescribed in the emergency plan, for rapid/unhindered and safe egress to designated emergency assembly areas;
(e) Coordinating the accounting of personnel and radioactive material after an emergency evacuation;
(f) Identifying safety related equipment and hazardous material that could be adversely affected by response actions;
(g) Coordinating emergency and response actions as the nuclear security event progresses or the emergency escalates.

Communication

I–9. Coordination between security response and emergency response actions needs to include communications systems and procedures that will address the following:

(a) Communication between response personnel and emergency workers;

(b) Awareness and understanding of the security response and emergency response actions and terminology;
(c) Coordinated notification of off-site response agencies;
(d) Coordination with the facility's public communication strategy.

Recovery

I–10. Coordination of the security response and emergency response needs to address post-event recovery considerations, including the following:

(a) Prioritized and coordinated recovery team efforts;
(b) Clearance of areas and site equipment (e.g. in the search for additional safety and security concerns) prior to returning the radioactive material to the original site and resuming operations;
(c) Preservation of forensic evidence, if necessary.

Training and exercises

I–11. Regular training and exercises need to be undertaken to verify coordination between security response and emergency response actions, which should include initial and periodic training, appropriate to the prescribed responsibilities and actions of the response personnel and emergency workers.

REFERENCES TO ANNEX I

[I–1] INTERNATIONAL ATOMIC ENERGY AGENCY, Developing a Nuclear Security Contingency Plan for Nuclear Facilities, IAEA Nuclear Security Series No. 39-T, Vienna (2019).
[I–2] FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL CIVIL AVIATION ORGANIZATION, INTERNATIONAL LABOUR ORGANIZATION, INTERNATIONAL MARITIME ORGANIZATION, THE INTERNTIONAL CRIMINAL POLICE ORGANIZATION – INTERPOL, THE ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, PREPARATORY COMMISSION FOR THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, UNITED NATIONS OFFICE FOR THE COORDINATION OF HUMANITARIAN AFFAIRS, WORLD HEALTH ORGANIZATION, WORLD METEOROLOGICAL ORGANIZATION, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna (2015).
[I–3] INTERNATIONAL ATOMIC ENERGY AGENCY, Security of Radioactive Material in Use and Storage and of Associated Facilities, IAEA Nuclear Security Series No. 11-G (Rev. 1), IAEA, Vienna (2019).
[I–4] INTERNATIONAL ATOMIC ENERGY AGENCY, Developing a National Framework for Managing the Response to Nuclear Security Events, IAEA Nuclear Security Series No. 37-G, IAEA, Vienna (2019).

Annex II

EXAMPLE OF A MEMORANDUM OF UNDERSTANDING
FOR THE DESIGNATED RESPONSE

II–1. This annex provides an example of a memorandum of understanding, which outlines the agreement between the operator and the designated response force.

II–2. This annex is adapted from annex II to IAEA Nuclear Security Series No. 39-T, Developing a Nuclear Security Contingency Plan for Nuclear Facilities establish the memorandum of understanding between the operating organization and the designated response force for nuclear security events involving radioactive material in use and storage [II–1].

MEMORANDUM OF UNDERSTANDING
FOR THE DESIGNATED RESPONSE FORCE

1. Introduction

The present memorandum of understanding outlines the agreement between the operator and the designated response force for the terms and conditions of both parties in relation to the following:

(a) The designated response force agrees to provide adequate, appropriate and effective response to calls for assistance in the case of a nuclear security event.
(b) The designated response force agrees to participate in preparedness activities to familiarize response personnel with the facility, as well as security exercises and training in relation to the response plan.
(c) The operator agrees to provide facilities, technical support, logistics, expertise and resources to support the designated response force.

This memorandum of understanding is subject to review at the request of either party (annually or otherwise) if changes occur to the governing conditions, such as operating regulations, statutory authorities or security threats.

2. Points of contact

The operator will designate a point of contact (‘designee’) as the primary facility site contact for security and for any issues that would need to be discussed with the designated response force’s designee. Additional points of contact could be identified between the operator and the designated response force. Any changes to the point of contact(s) should be immediately communicated to the concerned entities and relevant documents should be updated.

3. Initiation of the response plan

3.1. Initial notification

When a nuclear security event occurs at the operator's facility, the operator will follow the procedures outlined in the response plan to contact the designated response force.

3.2. Designated response force arrival

Following communication from the operator, the designated response force will deploy, in a timely manner, appropriate response personnel to the facility in order to assist the operator in mitigating the nuclear security event.

4. Responsibilities

4.1. Operators

The operator agrees to provide technical support, logistics, expertise and resources to support the designated response force. The following elements could be included:

(a) Information regarding any radiological and technical issues;
(b) Site maps and facility floor plans;
(c) Escorts;
(d) Compatible communications systems;
(e) Logistical support;
(f) Information on personnel and visitors at the site.

4.2. Designated response force

The designated response force agrees to provide personnel and equipment at the request of the operator to assist the facility during a nuclear security event. The memorandum of understanding could include the expected number, capability and estimated time of arrival of the designated response force (e.g. two armed officers will arrive on-site within 15 minutes of notification, and an additional six officers will arrive within 45 minutes).

5. Security exercises

5.1. Exercises

The operator would invite the designated response force to participate in security exercises and drills as part of the exercise programme, at a frequency of [X] every [X] years.

The operator should be responsible for planning security exercises, developing the exercise scenarios and coordinating the exercises. The designated response force would appoint a liaison officer to assist in the development and coordination of the designated response force involvement in the exercises.

5.2. Facility visits by the designated response force

The operator would invite the designated response force personnel to conduct visits of the facility in order to establish and maintain a level of familiarity with respect to response logistics, facility layout, operations and equipment.

6. Command and Control

The operator and the designated response force should adhere to the procedures and protocols established for the smooth handover of command and control as a nuclear security event escalates beyond the operator's and the designated response force level and warrants response from other multi-agencies that have responsibilities under the national emergency and response management system.

7. Communication

7.1. Communication resources

During nuclear security events at the facility, the operator and designated response force agree to have interoperable equipment and procedures, to the extent possible, in order to facilitate effective communication that is capable of providing secure and authenticated information. This communication would include the following factors:

(a) A direct phone line between the command and control elements;
(b) Compatible command centre radios and frequencies;
(c) Compatible portable security radios and frequencies;
(d) Other compatible communications devices.

7.2. Testing communication

The operator will test communication with the designated response force on a regular basis. If a test is not initiated by the operator, the designated response force can contact the operator and request that the test be conducted.

8. Termination

Either party can terminate the present memorandum of understanding at any time, without fault and without liability, upon written notice [X] weeks prior to the proposed termination.

Termination of this memorandum of understanding does not affect any other relationship or obligation between the parties.

9. Agreement

This memorandum of understanding constitutes the entire agreement between the parties. There are no other agreements, undertakings, representatives or warranties (i.e. collateral, oral or otherwise) relating to the subject matter herein.

IN THE WITNESS WHEREOF the parties have executed this agreement.

DATED AT_____ , this day_____ of year_____

Signature: _____

Name: _____

Chief of the designated response force
(Response force, pursuant to the delegated authority)

DATED AT_____ _____ , this day_____ of year_____

Signature: _____

Name: _____

Facility operator

Note: The memorandum of understanding would include an appendix detailing the relevant definitions used in the memorandum of understanding.

REFERENCES TO ANNEX II

[II–1] INTERNATIONAL ATOMIC ENERGY AGENCY, Developing a Nuclear Security Contingency Plan for Nuclear Facilities, IAEA Nuclear Security Series No. 39-T, Vienna (2019).

Annex III

EXAMPLE PROCEDURE FOR IMPLEMENTING THE RESPONSE PLAN

III–1. This annex provides an example of a written procedure that implements the response plan.

III–2. The purpose of this procedure is to establish and maintain predetermined actions in relation to the implementation of requirements for the response to unauthorized access to a location where radioactive material is present.

III–3. The operator identifies unauthorized access to a location where radioactive material is present, for example through visual observation by on-site personnel, video monitoring or alarm notification. The alarm can notify on-site personnel or the designated response force.

III–4. The procedure for response to unauthorized access includes the following steps:

(1) Assessing the potential unauthorized access;
(2) Ensuring a timely response by the designated response force;
(3) Impeding and preventing unauthorized actions;
(4) Ensuring reporting and notification;
(5) Terminating the response plan and resuming normal operations.

III–5. The first two steps in the procedure are to assess potential unauthorized access and ensure a timely response by the designated response force.

(a) If available, on-site personnel conduct an assessment of unauthorized access:
    (i) In the case of confirmation that no nuclear security event has occurred, normal operations can be resumed at the site.
    (ii) If unauthorized access is confirmed, the designated response force is notified.
(b) If the designated response force receives the alarm notification directly (in the absence of on-site personnel), response personnel are dispatched to assess the alarm.
    (i) In the case of confirmation that no nuclear security event has occurred, normal operations can be resumed at the site.
    (ii) If unauthorized access is confirmed, actions will continue in accordance with the response plan.

III–6. The third step in the procedure is to impede and prevent unauthorized actions, and this can be achieved as follows:

(a) On-site personnel (if available) assist and coordinate actions with the designated response force.
(b) The designated response force implements response actions as needed, assesses the situation and determines what additional resources are needed.
(c) Once the nuclear security event has been resolved, the designated response force coordinates actions with the operator to terminate the response plan and resume normal operations.

III–7. The subsequent sections stipulate the actions of responsible personnel under step four and step five, which would include the following:

(a) Operator:

(i) When applicable, the operator assesses potential unauthorized access.

(ii) The operator notifies the designated response force when unauthorized access has occurred or cannot be verified.

(iii) When applicable, the operator provides support to the designated response force once it arrives on-site by conducting information briefings, escorting the response personnel to target locations and providing the necessary personal protective equipment.

(b) Alarm monitoring personnel:

(i) Once an alarm has been triggered, the cause of the alarm should be assessed immediately, if possible.

(ii) Assessment can be performed by on-site alarm monitoring personnel (if available) at the location where radioactive material is present through remote video monitoring (e.g. at a central alarm station) or by personnel immediately deployed to investigate the cause of the alarm.

(iii) When off-site monitoring is used, the off-site alarm monitoring personnel assess potential unauthorized access through a remote video monitoring system.

(c) Designated response force:

(i) Upon confirmation of unauthorized access, the designated response force dispatches personnel to the site.

(ii) Upon arrival on site, the designated response force assesses the situation.

(iii) The designated response force takes the necessary actions to respond to the nuclear security event.

III–8. The fourth step would be to ensure reporting and notification of the nuclear security event, which would entail performing the necessary internal and external notifications, including to the competent authorities in accordance with the response plan.

III–9. The fifth and final step is the termination of a nuclear security event involving unauthorized access and would include the following decisions and actions:

(a) If the assessment confirms that unauthorized access has occurred, the designated response force would impede and prevent unauthorized actions.

(b) When the nuclear security event involving unauthorized access is resolved, the facility would resume normal operations and the response plan would be terminated.

III–10. This implementing procedure contains the following data and supporting guidance:

(a) Facility maps and floor plans;
(b) Off-site response contact list;
(c) On-site response contact list;
(d) On-site emergency plan.