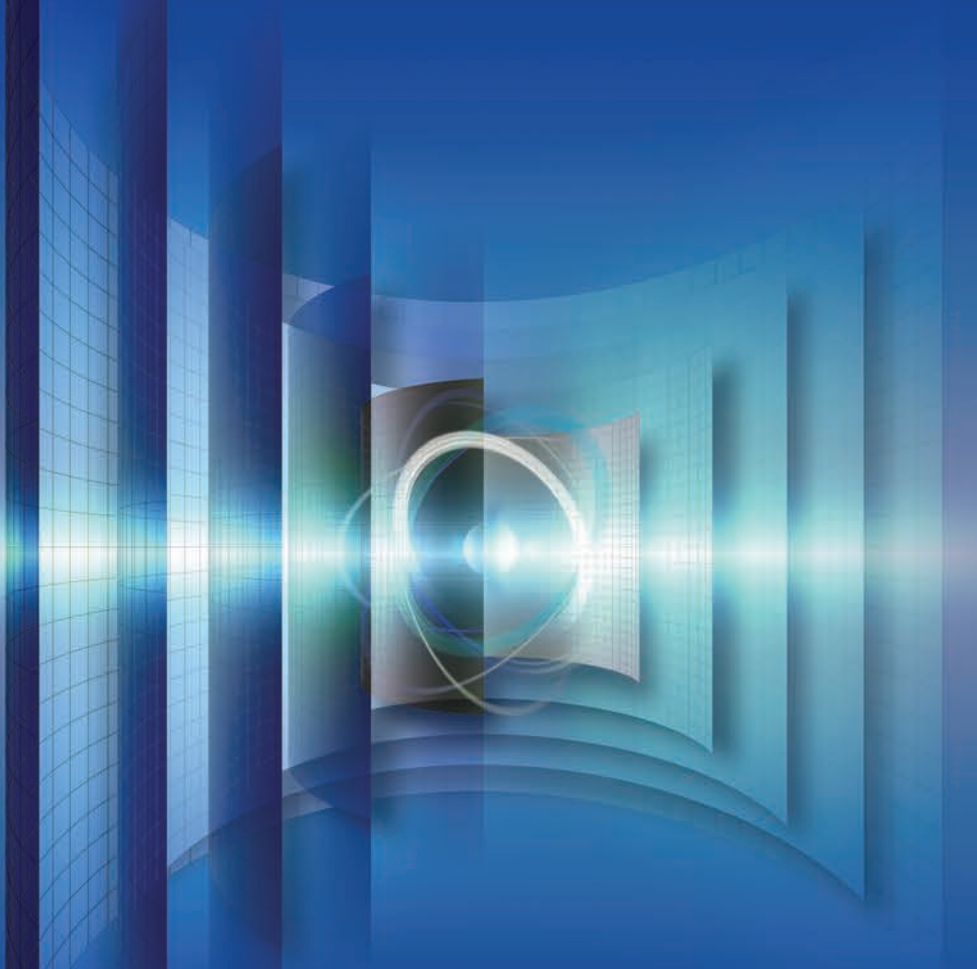
IAEA Nuclear Security Series No. 31-G

Implementing Guide

Building Capacity for Nuclear Security



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IAEA NUCLEAR SECURITY SERIES

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

CATEGORIES IN THE IAEA NUCLEAR SECURITY SERIES

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

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

DRAFTING AND REVIEW

The preparation and review of Nuclear Security Series publications involves the IAEA Secretariat, experts from Member States (who assist the Secretariat in drafting the publications) and the Nuclear Security Guidance Committee (NSGC), which reviews and approves draft publications. Where appropriate, open-ended technical meetings are also held during drafting to provide an opportunity for specialists from Member States and relevant international organizations to review and discuss the draft text. In addition, to ensure a high level of international review and consensus, the Secretariat submits the draft texts to all Member States for a period of 120 days for formal review.

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

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

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

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

BUILDING CAPACITY FOR NUCLEAR SECURITY

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

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BUILDING CAPACITY FOR NUCLEAR SECURITY

IMPLEMENTING GUIDE

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2018

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1400 Vienna, Austria
fax: +43 1 2600 22529
tel.: +43 1 2600 22417
email: sales.publications@iaea.org
www.iaea.org/books

Printed by the IAEA in Austria
July 2018
STI/PUB/1764

IAEA Library Cataloguing in Publication Data

Names: International Atomic Energy Agency.
Title: Building capacity for nuclear security / International Atomic Energy Agency.
Description: Vienna : International Atomic Energy Agency, 2018. | Series: IAEA nuclear security series, ISSN 1816–9317 ; no. 31-G | Includes bibliographical references.
Identifiers: IAEAL 18-01145 | ISBN 978–92–0–111916–2 (paperback : alk. paper)
Subjects: LCSH: Nuclear industry — Security measures. | Nuclear industry — Employees. | Nuclear facilities.
Classification: UDC 341.67:005.94 | STI/PUB/1764

FOREWORD

by Yukiya Amano
Director General

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

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

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

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

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

EDITORIAL NOTE

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

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

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

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

The use of particular designations of countries or territories does not imply any judgement by the publisher, the IAEA, as to the legal status of such countries or territories, of their authorities and institutions or of the delimitation of their boundaries.

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CONTENTS

1. INTRODUCTION

BACKGROUND

1.1. The potential for criminal or intentional unauthorized acts involving or directed at nuclear or other radioactive material or their associated facilities and associated activities is an ongoing global concern. Because of their widespread use, nuclear and other radioactive materials are vulnerable to sabotage, or to being stolen, lost or acquired illegally by individuals or groups that may use them for malicious purposes. Therefore, States need to establish, implement, maintain and sustain a national nuclear security regime to protect against such acts.

1.2. The objective of a State's nuclear security regime is to prevent, detect and respond to nuclear security events [1], and to protect persons, property, society and the environment from harmful consequences associated with nuclear and other radioactive materials. The importance of a nuclear security regime is recognized in the Nuclear Security Fundamentals and the three Nuclear Security Recommendations publications [1–4]. Building the capacity of organizations and people to establish, implement and sustain a nuclear security regime is an essential responsibility of a State.

1.3. States that are in the process of developing their infrastructure to support future nuclear activities, such as constructing their first nuclear power plant, are most likely to be interested in capacity building activities. The elements of developing the nuclear security infrastructure to support nuclear power programmes are described in Ref. [5], which maps the relevant IAEA nuclear security guidance against the IAEA Milestones in the Development of a National Infrastructure for Nuclear Power [6]. Reference [5] provides a phased approach to developing the infrastructure for a nuclear security regime.

1.4. Analysis of national nuclear security needs and existing infrastructure should drive the development of capacity building programmes to combat the threat of sabotage or the use of nuclear or other radioactive material for malicious acts, and to prepare effective response measures to nuclear security events. Capacity building for nuclear security should also be integrated with efforts to achieve the safe, secure and peaceful use of nuclear energy, as concluded in the IAEA report Capacity Building for Nuclear Safety [7].

1.5. The fundamental goal of capacity building is to enhance the abilities of relevant stakeholders to assess, establish and implement elements of a nuclear

security regime. The infrastructure needed for capacity building includes, among many other things, educational and training institutes with personnel competent in nuclear security, technical support centres, nuclear security laboratories and equipment, and the means to produce appropriate course materials.

1.6. In addressing how to build the capacity to establish, implement and sustain a nuclear security regime, it is necessary to look at the essential elements that should be in place and the underlying functions that make a security programme effective. The Nuclear Security Fundamentals [1] set out 12 essential elements of a nuclear security regime. Capacity building programmes need to be tailored to the national infrastructure and resources that are available, but also to address these 12 essential elements. The State needs to determine the organizations, equipment, technical facilities, human resources and competences needed to achieve these essential elements in a manner appropriate to the particular circumstances of the State.

OBJECTIVE

1.7. This Implementing Guide is intended as a reference document for States for the development of a national strategy for building the capacity of organizations and individuals to establish, implement and sustain an effective nuclear security regime. The roles of governments, organizations and individuals in capacity building are defined and key elements of capacity building programmes are described. Methodologies are provided for using a systematic approach to develop capacity building programmes.

1.8. This Implementing Guide is intended primarily for national competent authorities, institutions and other organizations (such as academic institutions and security agencies), and operators, as well as individuals involved in building the capacity for nuclear security.

SCOPE

1.9. This publication addresses capacity building for the security of nuclear material and nuclear facilities, radioactive material and associated facilities and associated activities, and nuclear and other radioactive materials out of regulatory control.

1.10. The term ‘capacity’ in this publication refers to an organization or individual that has both the competence (knowledge, skills, attitude) and capability (resources, authority, processes, equipment, means of deployment) needed to achieve their desired goal. Capacity building for nuclear security in this publication refers to a systematic approach to the use of education, training, exercises, awareness raising, workforce management, knowledge management and knowledge networks to develop and continuously improve the governmental, organizational and individual competences and capabilities necessary for establishing, implementing and sustaining an effective nuclear security regime. Capacity building efforts for nuclear security may be developed both indigenously within a State and/or cooperatively by working with other States or organizations.

1.11. Human, technical and financial resources are necessary to ensure effective nuclear security. Infrastructure, equipment and other physical elements support a State’s nuclear security regime. This publication does not address the underlying infrastructure that is needed to support a national security regime — guidance on this is provided elsewhere [2–5] — but instead focuses on the development and sustainment of governmental, organizational and individual competences and capabilities.

STRUCTURE

1.12. Following this Introduction, Section 2 of this publication describes roles and responsibilities for capacity building and Section 3 addresses the key elements of a capacity building programme. Section 4 describes different levels at which capacity building activities may be developed and Section 5 addresses the approach to developing a capacity building programme and the interface of capacity building efforts for nuclear security with nuclear safety activities.

2. ROLES FOR CAPACITY BUILDING

2.1. The overall responsibility for establishing, implementing and sustaining an effective nuclear security regime rests with the State. While the distribution of capacity building efforts will vary based upon the way in which the State assigns authorities and responsibilities for nuclear security, capacity building programmes are typically developed with roles at the following three levels:

(1) Governmental: Policy makers at the national level should enable capacity building by establishing the policies and frameworks within which organizations and individuals can operate effectively. The State should clearly assign responsibilities and facilitate effective coordination mechanisms for national competent authorities and other organizations that are responsible for implementing elements of the nuclear security regime. The State should also allocate sufficient resources for effective implementation of these elements.
(2) Organizational: Competent authorities and organizations involved in nuclear security should develop nuclear security capacity building programmes for management, personnel and any other relevant stakeholders that address nuclear security systems and measures relevant to their respective responsibilities. This includes fostering coordination and cooperation between relevant organizations both within and outside of the nuclear security regime. Organizations should communicate with the government about the resources and infrastructure that they need to develop the capacity to implement nuclear security measures while continuously fostering nuclear security culture.
(3) Individual: Individuals with responsibilities for nuclear security should develop their knowledge, skills and capabilities for nuclear security through educational, training and awareness raising activities, and through exercises. Individuals may also benefit from participating in workforce management and knowledge management activities and from knowledge networks for nuclear security.

2.2. To effectively fulfil specific functions needed for establishing, implementing and sustaining the State's nuclear security regime specific capacities are needed. A suggested list of such functions and capacities, derived from the Nuclear Security Fundamentals [1], is given in Annex I.

ROLES OF GOVERNMENT

2.3. The Nuclear Security Fundamentals [1] establish that the responsibility for nuclear security within a State rests entirely with the State, which has to ensure the security of nuclear material, other radioactive material, associated facilities and associated activities under its jurisdiction. Each State should aim to achieve its nuclear security objectives by creating its own, appropriately configured national nuclear security regime. The government should ensure that all those who have responsibilities within the State's nuclear security regime have the

necessary competences, and that these competences are maintained, so that the State can achieve its nuclear security objectives.

2.4. The distribution of governmental responsibilities for capacity building in a State will depend upon the existing legal, governmental and organizational arrangements. The State may take into account international guidance and best practices in selecting the most effective distribution of responsibilities.

2.5. The State should ensure that sufficient human, financial and technical resources are available to the government and to organizations with nuclear security related responsibilities, and that an appropriate number of capable individuals within the State are available to successfully establish, implement and sustain a nuclear security regime. In this context, the government should ensure the provision of resources for building and maintaining the competence of suitably qualified and experienced staff, and promote participation in national and international sharing of knowledge.

2.6. Specifically, the government should:

(a) Acknowledge its central role in building the capacity of the State's organizations and individuals to establish, implement and sustain an effective security regime. This includes developing appropriate strategies and coordinating with all relevant stakeholders.
(b) Provide within its legal framework the basis for the formulation and implementation of programmes to build the capacities needed to establish, implement and sustain an effective nuclear security regime.
(c) Define the roles of different organizations and assign the nuclear security responsibilities set out in the Nuclear Security Fundamentals [1], and provide for effective coordination among these organizations.
(d) Allocate appropriate resources to ensure that effective programmes are in place to build the capacity needed for an effective nuclear security regime and that key nuclear security organizations are able to attract and retain sufficient human resources in the short, medium and long term.
(e) Assess national level needs for capacity building, including evaluation of national infrastructure and resources for education and training to support the human resources development needed for the nuclear security regime.
(f) Facilitate awareness of the State's nuclear security policies and strategies, at the national, organizational and individual levels, as appropriate.
(g) Promote knowledge management and the exchange of knowledge to support building capacity for nuclear security.

(h) Identify those competences necessary for meeting nuclear security responsibilities that may need formal verification through a qualification, accreditation or certification programme.
(i) Ensure that mechanisms are in place to facilitate cooperation among all organizations important for the State's nuclear security regime and to enable organizations to feed back to the government issues of potential national concern that they may identify.
(j) Ensure that mechanisms are in place at the national level that enable organizations to cooperate with relevant international organizations and networks.
(k) Promote appropriate nuclear security culture within organizations that have responsibilities related to nuclear security.

ROLES OF ORGANIZATIONS

2.7. Organizations with nuclear security responsibilities include competent authorities and other organizations that deal directly with the security of nuclear and other radioactive materials, and organizations such as law enforcement or national security organizations with broader functions that include specific roles and functions related to nuclear security. Specific nuclear security responsibilities need specialized knowledge, skills and experience that may necessitate (in addition to appropriate personnel selection procedures) education, training and knowledge management to ensure that adequate capacities are developed within individual organizations or at the national level.

2.8. Organizations may develop their own nuclear security capacity building programmes and/or make use of capacity building programmes implemented at the national level. To ensure a systematic approach to capacity building, organizations should:

(a) Develop short, medium and long term workforce plans to identify their overall human resource needs and related requirements.
(b) Communicate to the government overall needs for meeting nuclear security responsibilities, to inform the development and maintenance of programmes for building capacity at the national level.
(c) Provide feedback to the government on any specific identified gaps or deficiencies in existing arrangements for capacity building.
(d) Work closely with other organizations with interests in building capacity for nuclear security, such as education, training and technical support institutions, to improve the quality of national provisions for capacity building.

(e) Facilitate awareness within the organization of nuclear security issues and related capacity building efforts.
(f) Develop and implement, as part of their management system, a systematic approach to capacity building within the organization.
(g) Establish mechanisms to monitor and assess the performance of their personnel and of the organization collectively, and promote feedback to identify necessary improvements in personnel training, organization or procedures, as appropriate.
(h) Develop strong training programmes, including frequent exercises, to develop and maintain skills and test plans, and to help reinforce the attitudes and behaviours that contribute to a robust nuclear security culture.

ROLES OF INDIVIDUALS

2.9. Individuals with responsibilities for nuclear security are expected to cooperate in and contribute to building their own individual competences as well as the collective competences of their organizations. Individuals need to understand the overall objective and strategy of nuclear security within their organizations and be able to communicate effectively and appropriately their observations and experiences to help identify and resolve issues and promote continuous improvement.

2.10. As well as developing their own knowledge, skills and experience, individuals involved in national nuclear security programmes should contribute to the development and continuous availability of the necessary collective knowledge to support the nuclear security regime in the State. Such individuals may contribute to building their and others' competences by participating in programmes of continuing education and training, including planned and on-the-job training programmes. Individuals should also strive to contribute to the body of knowledge for nuclear security in their organization and pass on this knowledge through the mentoring and training of others.

3. CAPACITY BUILDING ELEMENTS

3.1. Capacity building includes several key elements, in particular education, training, exercises, awareness raising, workforce management, knowledge management and knowledge networks. Education, training and exercise activities build capacity by facilitating the development of knowledge and skills, helping

new and existing professionals to master the principles and technologies associated with nuclear security, as described further in paras 3.2–3.22. In building capacity for nuclear security, awareness raising, targeting multiple audiences, can promote understanding of the importance of protecting nuclear and other radioactive materials, as described in paras 3.23–3.34. Workforce management, knowledge management and knowledge networks support the development, recruitment and retention of personnel with the necessary competences to strengthen nuclear security, as described in paras 3.35–3.61.

EDUCATION

3.2. Nuclear security education as described in this publication includes individual courses and other formalized instructional activities conducted through educational institutions. Education programmes in nuclear security should aim to establish in-depth knowledge and thereby help foster a nuclear security culture [8] in a country or region. Ideally, persons interested in pursuing a career in nuclear security should be able to receive specialized education on nuclear security, as these educated individuals are expected in the future to design, implement and evaluate the State's nuclear security infrastructure. A regional education programme could also be useful to establish a common understanding of nuclear security culture and enhance further collaboration on nuclear security with neighbouring countries.

3.3. Before embarking on any education programme, as part of the initial set of tasks during the establishment of the national policy and strategy, an assessment of the State's education needs in relation to nuclear security may be conducted. This may include an evaluation of the current capabilities of existing academic and technical education institutions, to ensure that the expertise exists to provide the necessary instruction related to nuclear security. A comprehensive plan for upgrading existing education curricula or developing new curricula may be formulated in conjunction with the development of national policy and strategy for nuclear security education.

3.4. Curricula for nuclear security education programmes should be developed through collaboration between the relevant stakeholders, which may include, for example, law enforcement and military academies and other designated nuclear security related organizations as well as universities and research institutions.

3.5. Education programmes may be tailored to suit the needs of the different organizations with responsibilities for nuclear security in the State, including

regulatory bodies and other competent authorities, law enforcement agencies and operators. The State may cooperate with other States and international organizations to provide insights into the competences and resources necessary for implementing a national nuclear security education programme. Prior to the development of curricula for such education, it may be useful to obtain experience of education in institutions in other States, either by sending students or by employing nuclear security specialists from other States to provide academic and practical education.

3.6. The education programme suggested in IAEA guidance [9] should be considered as a technical aid to facilitate the development of a comprehensive nuclear security education programme for a specific State. The guidance in Ref. [9] can assist in designing a programme to build and maintain relevant knowledge and skills, and sustain the pool of qualified personnel to deal with future nuclear security challenges.

3.7. Reference [9] primarily addresses the development of a university (Master's) degree programme; the provision of other educational opportunities should also be considered. Occupational education programmes in nuclear security related fields may also be included in curricula for technical or vocational institutions providing undergraduate degrees or certificate programmes. Short courses may be developed for continuing education and delivered via a variety of different mechanisms, including distance learning. Educational activities may also include internship programmes, linking educational institutions to the nuclear industry.

TRAINING

3.8. A well-trained workforce is needed for an organization to meet its nuclear security responsibilities and to contribute to an effective nuclear security regime. Selected members of this workforce may act as subject matter experts in developing more extensive training and educational materials and may serve as resources for building the national capacity for nuclear security.

3.9. Training is an organized activity aimed at helping recipients attain and maintain specific skills and generally improving their performance. Comprehensive training programmes can strengthen the State's nuclear security capabilities by:

(a) Developing the practical and operational knowledge and skills of personnel appropriate to their nuclear security responsibilities;

(b) Improving and sustaining operational readiness in response to evolving objectives, threats and technologies;
(c) Strengthening interjurisdictional and international coordination, communication and partnerships (as appropriate);
(d) Clarifying organizational structures, roles, responsibilities and authorities;
(e) Complementing awareness raising and exercise programmes to sustain and enhance a nuclear security culture.

3.10. Training, whether knowledge based or skill based, should be carefully designed to ensure its quality and effectiveness for the personnel being trained. Determining what is to be taught is critical to this process. This is accomplished through a systematic approach to training (SAT), which comprises five basic phases: analysis, design, development, implementation and evaluation. Evaluation occurs at each step of the process and also at the completion of the training cycle. The evaluation results are then acted upon to ensure continuous improvement of the training activity and, where appropriate, as input to other performance improvements, if such results indicate organizational issues.

3.11. In building capacity for nuclear security, training programmes at organizations should aim at ensuring that personnel have the knowledge and skills needed to meet national requirements and to follow IAEA guidance relating to nuclear security, and at improving performance in applying them. Based upon the assessment of training needs, training may be designed and developed using different mechanisms to accomplish identified objectives. States may apply several different training mechanisms as part of an SAT:

(a) Classroom and practical training: Many States implement training that includes a mixture of classroom style instruction and practical, hands-on training that can be linked to specific modalities or threats. Classroom type training includes the use of textbooks, educational films and equipment demonstrations. Practical training may include hands-on training with relevant equipment, practising performing security functions and learning to use analysis software. Mock-ups or model facilities of, for example, a gateway, port or inspection station may prove useful for such training.
(b) On-the-job training: Many implementing organizations rely on on-the-job training, at headquarters and in the field, for their personnel. On-the-job training may be particularly valuable in promoting the skills and intuition needed by inspectors: on-the-job mentorship by experienced personnel can add a broader context for nuclear security systems and measures. When investing in new capabilities, experienced workers are often leveraged to operate the equipment. A key challenge of on-the-job training is educating

personnel who do not themselves have specific equipment, but may have sufficient situational awareness through their intuition and observations to identify anomalies with documentation (such as manifests or invoices), or with conveyances, conveyance operators or containers, and to seek additional assets or assistance in resolving the situation.

(c) Train the trainer: Methods such as train the trainer can help improve the consistency of training and reduce the costs (in money and time) of training and maintaining the skills of large numbers of personnel. Under this model, one person is selected to become an expert by attending new or refresher training classes covering both the technical subject areas and teaching methods. This person subsequently serves as a local trainer for other nuclear security personnel.

(d) Virtual training: Virtual learning can help to minimize costs and disruption to operations by making training more accessible to personnel at convenient times. Virtual training can be of several types, including e-learning (i.e. computer based training), response simulators and virtual reality simulations. However, not all training topics and types are amenable to virtual approaches.

(e) Collective training: For several types of learning, an individual is trained in his or her specific tasks in isolation. Collective training may be a valuable complement to individual training by offering opportunities for collaborative learning, team building and training in tasks that are performed as a team. In such activities, participants are dependent on each other's skills and resources to maximize learning. Collective training is likely to involve intensive interaction, accountability to other participants, and engagement in common tasks. For example, collective training could include cross-disciplinary training on nuclear security detection that brings together regulatory officials and frontline officers to facilitate joint training and understanding of regulations, operational procedures and response protocols.

3.12. Training is generally focused on learning a new skill for a specific job or on improving performance. Fundamentally, an SAT should help to provide all of the training needed to address performance needs within the established competence framework. The first phase of the SAT is to determine the training needs of personnel at all levels and with all types of responsibility for nuclear security. This is a major task that involves analysis of the performance requirements (i.e. duties and tasks) of individuals who have direct responsibility for planning, implementing and/or evaluating the effectiveness of the nuclear security programme. In this analysis phase, tasks are analysed to determine which are critical (and therefore need formal training) and which are less critical (and

therefore may be learned through other means, such as on-the-job training or reading assignments). Training objectives are formulated based on these critical tasks and organized into a training programme for each task: a logical progression of lessons designed to achieve the defined training objectives. The content of each lesson is then documented in a lesson plan, which includes directions for the instructor and associated training aids to enhance learning (such as visual aids, models and simulations). The training is then delivered to the students in accordance with the documented lesson plan.

3.13. At each step in the process, the activities performed and the products developed are evaluated. This evaluation measures the validity of the training as it is being developed, and determines whether the training was effective and how it may be improved for the next iteration, thereby ensuring a process of continuous improvement. Several IAEA publications describe the SAT in detail and its application in a range of areas [10–13].

3.14. Effective training is necessary to build a core group of people with the necessary expertise to serve as nuclear security programme managers and technical experts, and to train further developers and instructors who in turn will work to strengthen nuclear security capacity. However, establishing this human resource foundation takes time and persistence, and each State should use its available resources as effectively as possible. States and organizations implementing training programmes need to identify the various training topics to be taught, the institutions and mechanisms to implement the training and the required frequency of training for different topics. Defining each of these elements prior to implementing any training programme will support building nuclear security capacity and competences in a sustainable fashion.

3.15. Training courses offered through the IAEA, and support offered through other international programmes and regional resources (such as nuclear security training and support centres (NSSCs)), may be of assistance in developing a comprehensive capacity building effort. However, developing a core group of experts is not enough. Training should be incorporated into the State's infrastructure to ensure that the capacity for nuclear security can be sustained and expanded, if necessary. This will necessitate the training of personnel to become both curriculum developers and training instructors.

3.16. In addition to planning an SAT, and developing and implementing the appropriate training courses, facilities and infrastructure will also be necessary to support capacity building. Training facilities should be established, on a national,

regional or organizational scale, as appropriate, to ensure that training can be effectively delivered.

Exercises

3.17. Nuclear security exercises are conducted to validate and evaluate policies, plans, procedures, equipment and operations and the adequacy and efficiency of trained personnel. The use of exercises will enhance organizational readiness and help develop the processes and procedures to evaluate and monitor the effectiveness of detection and response systems. Nuclear security exercises provide a means to assess capacity building needs, build capacity and evaluate the effectiveness of capacity building efforts.

3.18. Exercises can facilitate greater operational understanding of how people, equipment and systems perform and identification of gaps or vulnerabilities that can be addressed to further improve security systems and measures. Exercises can also help sustain motivation and operational readiness of nuclear security personnel by:

(a) Bringing together organizations and individuals with different roles, responsibilities and authorities to practise applying their own skills and procedures, and coordinating with others;
(b) Informing, motivating and promoting confidence in those responsible for nuclear security detection and response;
(c) Evaluating and validating strategies, procedures, operations, equipment, training levels and awareness;
(d) Identifying gaps and areas of vulnerability in nuclear security systems and measures;
(e) Testing new approaches, scenarios, techniques and technologies for nuclear security.

3.19. To facilitate effective planning and implementation of exercises to support building capacity for nuclear security, exercises should be:

(a) Appropriate in nature and scale to the size and maturity of the nuclear security regime;
(b) Planned in consultation with all relevant stakeholders to promote effectiveness;
(c) Integrated with other activities to make best use of resources;
(d) Designed to support continuous assessment and improvement of practices;
(e) Evaluated to facilitate development of improvement plans, if necessary;

(f) Supported by effective communication about the planning, conduct and outcomes of the exercises.

3.20. Using a defined exercise methodology to organize critical events, tasks and decisions can help to ensure that the conduct of exercises will support capacity building.

3.21. There are two basic categories of exercises for nuclear security:

(a) Discussion based exercises are designed to create and/or to evaluate existing processes (plans, policies and procedures) at the intra-agency, interagency or regional level. Discussion based exercises may be workshops or table top exercises, based on realistic scenarios, including an evolving sequence of (simulated) events to test different processes and communications, including the simulated movement of field personnel and equipment. Discussion based exercises can be used to identify and assess awareness, knowledge and understanding of policy and may be used as a preparatory step to operations based exercises.
(b) Operations based exercises are designed to evaluate individual and collective capabilities at the intra-agency, interagency or regional level. An operation based exercise involves field personnel and assets responding to realistic scenarios in a manner that closely mimics the pressures and constraints of an actual incident. An operations based exercise may be used to identify gaps in training, organizational response and procedures in near real time. Operations based exercises could be conducted as either announced or unannounced activities.

3.22. When considering exercises to support capacity building, it is helpful to outline the phases of the exercise, including initiation, planning and design, preparation, the exercise itself, wrap-up activities, evaluation and subsequent reporting and improvement plans. The evaluation and post-exercise reporting and improvement plan should ensure that strengths and weaknesses in capabilities, skills and knowledge identified during or after the exercise are corrected to continually improve capacity for nuclear security.

AWARENESS RAISING

3.23. Awareness raising differs from education or training in that its objective is limited to making the target audience aware of a particular condition, event or issue rather than providing broad knowledge or skills to accomplish a specific

task. Awareness is achieved when an individual, at whatever level (e.g. with national or organizational responsibilities, or a member of the public[1]) internalizes information regarding nuclear security, threats, nuclear security systems and measures, and organizational roles and responsibilities relevant to his/her own responsibilities, and develops the desired behaviours and beliefs appropriate for his/her situation.

3.24. Awareness raising programmes are less formal than education or training in the method of development, delivery or measurement of effectiveness. Awareness programmes need to be implemented carefully in order to take into account the requirements for protection of sensitive information related to nuclear security and the 'need to know' rule, depending on the target audiences.

3.25. In order to establish a strategy for developing an awareness programme, goals should be established to focus awareness raising efforts, including the following:

(a) Providing individuals with foundational knowledge and guidance relevant to their roles and responsibilities for nuclear security (e.g. information on nuclear security threats, detection options and operations) for building an effective nuclear security culture. This knowledge can provide a basis for advanced training and a broader understanding of one's responsibilities.
(b) Fostering the development of political will of government entities and organizations to build and sustain nuclear security capabilities and programmes. It is believed that institutionalizing nuclear security within the responsible organization will enhance the effectiveness of national nuclear security capabilities.
(c) Promoting a common terminology and basis for raising awareness with the general public and non-governmental organizations.

[1] Reference [14] states that: "Raising public awareness is an important part of efforts at the national level to prevent criminal or unauthorized acts involving nuclear and other radioactive material, and should be taken into consideration during the development of the national nuclear security training programme. The State's competent authorities are encouraged to participate in the development and establishment of an effective programme to raise public awareness. The form of a public awareness programme should be consistent with the national regulations and, accordingly, will vary from State to State. It may include information on changes in legislation, advertising campaigns directed towards target groups such as metal recycling industries, or news items on successful instances of prevention."

3.26. To accomplish these goals, States may draw upon the following set of guidelines for planning, developing, implementing and sustaining effective nuclear security awareness raising:

(a) Communicate the need for nuclear security efforts;
(b) Include a core set of themes;
(c) Develop awareness for all roles and audiences;
(d) Customize efforts to specific audiences;
(e) Plan and organize to promote effectiveness;
(f) Establish awareness as a continuous process;
(g) Evaluate awareness efforts regularly and update as necessary.

3.27. In building capacity for nuclear security, awareness raising programmes are implemented primarily by the government or organizations but may focus on three specific target audiences: the public, policy makers and operators and authorized persons. The goals of awareness raising may be different for each group, and different approaches to awareness raising may be needed.

3.28. Awareness raising programmes may be particularly relevant for the public, in general, or with emphasis on a particular group, such as scrap metal dealers and others, whose work could potentially lead to them encountering radioactive material. Such programmes may be included within broader public awareness programmes, such as those covering hazardous materials or public health, or general security. However, care should be taken not to cause undue concern: public awareness programmes should be carefully designed and systematically implemented to ensure that the programme meets its objectives.

3.29. In addition to general informational messages, awareness campaigns may also consider addressing the specific responsibility of the public to report suspicious activities that may be indicators of threats that could endanger public safety. The principal method of making the public aware of these issues is through routine public awareness campaigns. These campaigns should provide factual information about nuclear or other radioactive materials and the associated risks, and should describe the safety and security measures that are in place to protect the public (without disclosing sensitive information).

3.30. Awareness raising campaigns targeting the public may be communicated through major media outlets, such as television, radio, newspapers and the Internet. They may also include public seminars, meetings and roundtables. Information dissemination as a part of an awareness programme may also be achieved by simple means, such as pamphlets or posters.

3.31. Awareness raising programmes aimed at policy makers are important for competent authorities involved in the development and implementation of the nuclear security regime. Awareness may be necessary to obtain governmental support for the implementation and sustainability of nuclear security measures. Government personnel at all levels should understand the need for nuclear security, but particularly those in management or decision making positions, regardless of their areas of responsibility. Successfully raising awareness among policy makers can promote coordinated planning at the national level and effective allocation of resources for nuclear security activities.

3.32. For operators and authorized persons who use, process or store nuclear or other radioactive materials, nuclear security awareness programmes should be developed and implemented for all personnel. For operators, the principal objectives of increased awareness are to provide individuals with an understanding of the context for and importance of their roles and responsibilities in preventing nuclear security events and improving their operational readiness in case of a nuclear security event, and providing foundational knowledge for building a nuclear security culture.

3.33. General responsibilities of which all individuals should be made aware include reporting suspicious activities, the presence of unauthorized personnel within restricted areas, the presence of prohibited items in areas where nuclear or other radioactive materials are present, and personal events that may affect the trustworthiness of themselves or other colleagues. Awareness raising programmes should provide specific guidance on what information is to be reported and how.

3.34. Mechanisms for awareness raising may include methods that help transfer knowledge and beliefs and that can be supported by entities or partnerships, including government, academia, media, non-governmental organizations and non-nuclear industries. One example of such a mechanism is the centre of excellence approach, which has been used in both the public and private sector. Selecting the mechanism or combinations of mechanisms to employ depends heavily on the intended audience, the topics to be covered and the audience's initial understanding and acceptance of nuclear security principles.

WORKFORCE MANAGEMENT

3.35. Reference [5] indicates that the State should ensure that its competent authorities and other organizations with nuclear security responsibilities develop strategies to ensure the long term availability of key human resources

in the nuclear security area. They should provide these authorities with sufficient financial, human and technical resources to fulfil their nuclear security responsibilities on a sustainable basis [1].

3.36. The following elements should be incorporated into workforce management strategies:

(a) Workforce planning;
(b) Career management;
(c) Performance management.

3.37. Since nuclear security requirements are determined in accordance with a State's national policy and nuclear infrastructure, the necessary competences for each element of a national nuclear security programme need to be defined at the national level. The strategy of workforce management should be designed to meet the needs of the State and should facilitate the development and enhancement of nuclear security knowledge and skills within the State. All competent authorities and other organizations responsible for nuclear security should be involved in the needs assessment and in the subsequent development of tailored strategies for workforce management at both the national and organizational levels.

Workforce planning

3.38. Workforce planning involves addressing both short term and long term needs to continuously fulfil nuclear security responsibilities. It involves planning for the whole employment cycle, from recruitment to retirement, including short and long absences, special situations requiring extra resources and succession planning.

3.39. A recruiting strategy is needed to attract a high quality workforce to meet current and future staffing needs for nuclear programmes, including regulatory bodies and other competent authorities. Merit based promotion systems may help attract highly motivated candidates to the security field and encourage them to gain competences and achieve a higher performance level.

3.40. The provision of stable and secure employment may serve, in some States, as a powerful incentive to staff to be continuously committed to meeting nuclear security requirements. This feature may also support knowledge management, which is discussed further in paras 3.46–3.54.

Career management

3.41. Career management includes continuously motivating personnel with nuclear security responsibilities to continuously improve their performance. Providing appropriate remuneration commensurate with an employee's contribution is a good practice. Rewarding individual employees for outstanding performance may also serve to encourage the workforce in general to improve their performance and to contribute to achieving nuclear security objectives.

3.42. Another important consideration for career management is the planning of personal career paths. Providing a clear career path towards higher positions helps personnel set their own professional goals, thereby encouraging them to strive for promotion. This starts with assigning personnel to positions that fit their own competences and then allowing them to develop and continuously improve their overall nuclear security performance.

Performance management

3.43. Performance management is a key part of workforce management, and includes periodic performance evaluation. In these periodic evaluations, particular emphasis should be placed on identifying possible gaps between expected and actual performance and the reasons for them.

3.44. Different skills are involved in fulfilling different nuclear security responsibilities. Some skills can be attained relatively quickly, but others take more time, and different individuals may also attain skills at different rates. Uneven development of individual skills needs to be evaluated from a long term perspective, and periodically reviewed to determine whether the situation is improving within expected timescales.

3.45. If weaknesses in performance are found to result from functional deficiencies in the workforce management programme (rather than weaknesses at the individual level), a thorough analysis should be carried out to identify the underlying causes of these deficiencies and correct them. These causes could include misinterpretation of needs, inadequate workforce planning, incomplete or ambiguous procedures, mismatches in personnel assignments, a lack of incentives to encourage better performance, or many others.

KNOWLEDGE MANAGEMENT

3.46. Nuclear security related knowledge needs to be appropriately managed in order for it to be used to effectively build capacity. The knowledge acquired in operating a nuclear security system should be shared among those with roles and responsibilities relating to the system, to achieve better performance. It should also be preserved in a manner allowing it to be efficiently transferred to individuals assigned such roles and responsibilities in the future. Therefore, knowledge management should be an integral part of capacity building programmes and needs to be aligned with workforce management strategies.

3.47. Knowledge management is an integrated, systematic approach to identifying, acquiring, transforming, developing, disseminating, using and preserving knowledge, relevant to achieving specified objectives. States should aim at establishing a knowledge management system and coordinating related activities to build a structure in which to share and effectively transfer the necessary knowledge to support capacity building efforts. Knowledge management activities need to involve the following:

(a) Identification of knowledge needs;
(b) A process for acquisition of the necessary knowledge;
(c) Transformation of the acquired knowledge to meet specific needs, and dissemination to those with roles and responsibilities relating to the nuclear security system;
(d) Preservation of the knowledge for future application.

3.48. Identifying the knowledge that needs to be managed for capacity building purposes should be the first step in a knowledge management process. The knowledge identified to meet these needs may be explicit, such as technical information on paper or in electronic form, or may be tacit, such as experience based insights and skills in the people implementing nuclear security measures. The identified knowledge, either explicit or tacit, needs to be recorded and stored in an organizational knowledge database.

3.49. The acquired knowledge then needs to be transformed and interpreted to be used for specific capacity building needs, tailored to national circumstances. Interpretation in this context could involve specifying which elements of the knowledge need to be used for which purposes, such as problem solving, new technology development or decision making, to achieve the desired nuclear security performance.

3.50. After the transformation process, the knowledge needs to be disseminated to people with the need to know in order to meet nuclear security objectives. Channels for knowledge dissemination need to be defined and optimized to ensure that the knowledge reaches and is understood by the intended recipients.

3.51. Knowledge preservation is a vital component of knowledge management and is critical to maintaining and continuously improving capacity within a nuclear security regime. Knowledge preservation needs a system with the ability to archive, retrieve and protect the acquired knowledge, and to maintain the usability of the knowledge for future application.

3.52. Knowledge management needs to include organizational knowledge as well as individual knowledge. A knowledge management system thus needs to be established at the organizational level. The State needs to promote the establishment of such systems within organizations with nuclear security responsibilities.

3.53. The State may assume other roles with regard to knowledge management for nuclear security capacity building. One such role could be to create a national database for particular types of knowledge, with the purpose of advancing national capacity building efforts; one example would be a database of nuclear security terminology. Establishing a nuclear security terminology database may be useful to ensure that those with nuclear security responsibilities in all relevant organizations have the same understanding of each nuclear security function and role, as well as to help those acquiring new nuclear security responsibilities.

3.54. Another example is a database of nuclear security personnel with common roles. The validity, usefulness and usability of particular knowledge differ from recipient to recipient, depending on their respective roles and responsibilities. Sharing knowledge can be beneficial if the acquired and preserved knowledge is shared among those who have common roles in a nuclear security system. A database of nuclear security personnel with common roles could therefore be useful to enable effective dissemination of the necessary knowledge among those with similar roles and responsibilities in different parts of the national nuclear security regime.

KNOWLEDGE NETWORKS

3.55. Knowledge management can be supported through the development and utilization of knowledge networks. Knowledge networks include people with

nuclear security knowledge and serve as a platform to enable the analysis and sharing of such knowledge to supplement efforts to build national nuclear security capacity. Knowledge networks can be established at both the national and international levels.

3.56. Knowledge networks for nuclear security at the national level could serve as a pool of people considered as human resources to build national nuclear security capacity. For example, the graduates of Master of Science programmes in nuclear security might represent the list of people considered competent to serve as nuclear security officers in competent authorities and other nuclear related organizations. Establishing such a network helps the State to be equipped with competent human resources to continuously meet national nuclear security requirements. This network could include groups with different specializations, including, for example, analysis of national nuclear security policies, nuclear security risk assessment or design and evaluation of physical protection systems.

3.57. Knowledge networks for nuclear security at the national level could also support effective knowledge management in a State. Knowledge networks based on specified types of responsibility in a national nuclear security regime are ideal units for effective knowledge sharing, among people with common roles, on good practices in those roles, thus encouraging continuous improvement of their performance.

3.58. National knowledge networks are also useful channels for the implementation of national nuclear security capacity building programmes. Such programmes, such as through NSSCs, need the involvement of all stakeholders, including competent authorities, operators, technical support organizations (TSOs), law enforcement agencies and organizations responsible for response to nuclear security events. Cooperation and coordination among these stakeholders are critical for programmes to be effective in meeting national needs for nuclear security capacity building. National knowledge networks for nuclear security should be a basis for such cooperation and coordination.

3.59. At the international level, knowledge networks are expected to facilitate cooperation and the sharing of lessons learned, and to serve as possible channels for international coordination. Knowledge networks can be established among groups of States with common challenges in the area of nuclear security, in which the participating States learn from each other’s experience and expertise to address the challenges they face.

3.60. The International Nuclear Security Education Network (INSEN) is one example of an international knowledge network. The INSEN aims to enhance global nuclear security by developing, sharing and promoting excellence in nuclear security education. The participating States collaborate on the development of peer-reviewed textbooks, computer based teaching tools and other instructional materials, the arrangement of faculty exchanges and joint development and implementation of in-depth nuclear security training programmes, and the conduct of joint research and development activities to share scientific knowledge and infrastructure.

3.61. The International Network for Nuclear Security Training and Support Centres (NSSC Network) is another example of a knowledge network, and is designed to facilitate the efforts of participating States to improve their capabilities in capacity building. The NSSC Network provides opportunities for NSSCs to promote a high level of nuclear security training and support services in the development of sustainable national, regional and global NSSCs. In addition, the NSSC Network facilitates cooperation and assistance activities (including technical and scientific activities for nuclear security), and helps to coordinate the use of available resources to meet specific needs. To this end, the NSSC Network serves as the platform to standardize the quality of nuclear security training through the support provided by the IAEA under this framework for the development of training curricula and materials.

4. NATIONAL LEVEL AND ORGANIZATIONAL LEVEL CAPACITIES

4.1. In discharging the responsibilities necessary to fulfil its nuclear security objectives, the State should endeavour to strengthen its capacity at the national and organizational levels.

NATIONAL LEVEL

4.2. As described in paras 3.23–3.34, awareness is the foundational state of knowledge on nuclear security. Hence, the first national level capacity need for nuclear security is general awareness of relevant nuclear security issues among all individuals and organizations with responsibilities related to nuclear security. At

the State level, the capacities needed to implement an effective nuclear security regime can be described under several overarching categories:

(a) General knowledge;
(b) Legislation;
(c) Coordination;
(d) International cooperation;
(e) Leadership;
(f) Threat and risk assessment.

4.3. General knowledge of nuclear security includes the ability to recognize nuclear security threats and understand the potential consequences of theft, sabotage and other criminal or intentional unauthorized acts involving or directed at nuclear material, other radioactive material, associated facilities and associated activities. It also includes a basic understanding of information security, including the need to protect the confidentiality of sensitive information.

4.4. Legislation related capacity includes the knowledge, skills and experience necessary to develop, review, assess and revise laws and regulations, understanding of the responsibilities delegated to competent authorities, and general familiarity with the legislative and regulatory framework of the national nuclear security regime.

4.5. Coordination involves recognizing the responsibilities for nuclear security of each competent authority through the legislative and regulatory framework and seeking ways to ensure that all of these responsibilities are met as effectively as possible. The development of capacity for coordination will ensure that there are appropriate mechanisms in place to facilitate coordination and communication between the different authorities with responsibilities for nuclear security. Planning and policy development may also need coordination between organizations and with decision makers at the national level.

4.6. At the national level, capacity for international cooperation provides global awareness for the national stakeholders. Such awareness includes familiarity with international obligations and the global nuclear security framework, as well as recognition of the need to establish the national legislative and regulatory framework. Stakeholders should be aware of national policy regarding international assistance and cooperation to support the national nuclear security regime. Such international assistance may be sought from international organizations, such as the IAEA, and/or from other States.

4.7. Capacities for leadership reinforce the development, implementation and sustainment of nuclear security systems and measures. Leadership for nuclear security also helps to develop and sustain a strong nuclear security culture and support the allocation of human, technical and financial resources towards nuclear security activities.

4.8. Threat and risk assessment capabilities and competences include the expertise and technical knowledge needed to perform a national threat assessment for nuclear security, including identifying potential targets and consequences. Capacity to perform threat and risk assessments supports the design of effective security systems and measures through a risk informed approach. These processes involve the participation of different competent authorities to obtain all of the specific expertise needed.

4.9. To support nuclear security systems and measures, the State should have the competence to establish procedures for reliable and timely exchange of threat and risk information, in accordance with its national information security policies and regulations and international obligations.

ORGANIZATIONAL LEVEL

4.10. Relevant organizations within the State should build the following capacities, as necessary, for their specific responsibilities:

(a) General knowledge;
(b) Legislation;
(c) Regulatory control;
(d) Information security;
(e) Coordination;
(f) Technical measures;
(g) International cooperation;
(h) Threat and risk assessment.

4.11. General knowledge for nuclear security at the organizational level includes a basic understanding of nuclear security topics and the related nuclear security responsibilities within a specific organization. Organizations should also demonstrate their capacity to establish and sustain an effective nuclear security culture.

4.12. Legislation related capacity includes an understanding of the relevant legislation and responsibilities at the organizational level. Legislation related capacity is also necessary to support the relevant competent authorities in fulfilling their assigned responsibilities.

4.13. Competent authorities need capacity to ensure appropriate regulatory control of nuclear and other radioactive materials in the State. This includes the capacity for establishing and enforcing an appropriate regulatory framework in the national nuclear security regime, including performing regulatory oversight of nuclear security systems. Thus, organizations assigned regulatory functions need to build the capacity for establishing mechanisms for verification and enforcement to ensure compliance with applicable regulations and requirements, including the imposition of appropriate and effective sanctions for any non-compliance. It is therefore necessary to possess the capacity for registering and controlling any nuclear and other radioactive material within the State. Regulatory capacity contributes to the effective design, development, implementation and communication for the development of a nuclear security plan.

4.14. Capacity in information security means that the organization has the capacity to handle sensitive information in accordance with national requirements and establish measures to protect its confidentiality, integrity and availability. The State's competent authorities will develop and issue information security policy and instructions specific to nuclear and other radioactive materials and associated facilities and associated activities. Relevant organizations within the State should have the capacity to establish their internal policy, plans and procedures for protecting the confidentiality, integrity and availability of their sensitive information in compliance with the national information security policy. The organization should have the capacity to enforce these measures for the security of sensitive information. Furthermore, its employees should recognize the need for the security rules and follow the established information security management programme.

4.15. Coordination at the organizational level involves capacity for planning, operations and communications across the relevant organizations to prevent a nuclear security threat from completing criminal or intentional unauthorized acts involving or directed at nuclear material, other radioactive material, associated facilities, or associated activities, or to detect or respond to nuclear security events. Relevant organizations should develop security systems and measures, as well as response plans, coordinating with other organizations as appropriate. These organizations should be able to mobilize resources rapidly and effectively in response to a nuclear security event. During a response to a

nuclear security event, the organizations should ensure effective coordination and cooperation among all those carrying out response functions, with due regard to safety and security aspects. To be in a position to do this, the responsible organizations should exercise, test and evaluate the response plan periodically. The organizations should be capable of taking actions to mitigate and minimize harmful consequences from nuclear security events to persons, property, society and the environment.

4.16. As appropriate, the organization should have the capacity to design and implement both security and safety measures in an integrated manner so that synergies between these two areas are identified and exploited. Furthermore, the organization should have the capacity to ensure that security measures do not compromise safety and safety measures do not compromise security. The organization should be able to allocate resources for nuclear security systems and nuclear security measures and conduct nuclear security related activities based on a graded approach and defence in depth through proper legal and regulatory functions.

4.17. Technical capacity includes the capacity to design, operate and maintain relevant nuclear security equipment, such as physical protection systems to prevent unauthorized removal of nuclear and other radioactive materials or sabotage of such material or its associated facilities. The capacity to effectively inspect and evaluate such preventive and protective equipment is necessary to ensure sufficient protection and regulatory compliance at relevant facilities.

4.18. In addressing material out of regulatory control, capacity is needed at the organizational level to operate and maintain detection equipment, providing testing and calibration services for detection equipment and advice for relevant organizations with regard to detection analysis to support effective decision making during a nuclear security event.

4.19. Technical capacity is also needed to support appropriate detection and response mechanisms, with assessment of specific data and information. Some organizations will need to develop or obtain expertise in scientific fields to support adjudication of detection alarms (or information alerts) and nuclear forensics capabilities to support criminal investigation. The competent authorities also need to ensure that authorized persons are able to develop their capacity for effectively detecting and neutralizing adversaries before they are able to complete malicious acts. Authorized persons should also possess the capacity for maintaining records on nuclear security systems and measures and nuclear security events at facilities.

4.20. Capacity in international cooperation means that relevant organizations possess the capacity for establishing communication and cooperation with international counterparts to support the nuclear security regime. Such capacity is necessary to facilitate international relations, promote information exchange and build networks among relevant parties. Organizations should have the capacity to identify international cooperation programmes that are necessary to support the overall nuclear security implementation in the State.

4.21. Capacity in threat and risk assessment is necessary for the organization to evaluate the threat to its nuclear material, other radioactive material, associated facilities or associated activities, so that the necessary nuclear security measures can be established. The State's competent authority will require the use of a threat assessment and/or a design basis threat as a common basis for the design and implementation of nuclear security measures by operators, shippers and carriers. Relevant organizations within the State should have the capacity to assess nuclear security threats, using credible sources of information on the motivation, intentions and capabilities of these threats. The organization may also need the capacity to gather and analyse information on nuclear security threats and provide recommendations for the improvement of nuclear security measures. In this area, intelligence organizations need to possess the capacity to provide threat information to support the design, development and implementation of specific nuclear security plans.

5. CAPACITY BUILDING METHODOLOGY

5.1. Building capacity for nuclear security should be undertaken via a systematic approach that includes provisions for assessment, planning, implementation, documentation, evaluation and feedback. This approach should be developed as part of a State's national security policy and implementation strategy. Before initiating the approach, the government should decide which organizations should coordinate the approach at the national level. Furthermore, each organization with responsibilities should assign a unit to perform the necessary work.

ASSESSMENT AND STRATEGIC PLANNING PROCESS

5.2. In building capacity for nuclear security, a State should identify its needs, resources and gaps through an assessment process. The self-assessment of a capacity building programme involves addressing four questions:

(1) What capacity is needed?
(2) What is already available to meet the needs?
(3) What is missing or has to be improved in order to meet the needs?
(4) What actions are needed?

5.3. Using this self-assessment methodology, the State can identify gaps and identify appropriate capacity building methods by which to fill them. The self-assessment can be undertaken at two basic levels: national and organizational.[2] The self-assessment methodology should address the capacity building elements as described in Section 4.

5.4. The questions that are asked should determine what is needed and what might be needed in the future, taking into account the current situation of the Member State and its future plans.

5.5. In order to undertake the self-assessment, the following four-stage process is suggested:

(1) The organization assigned the task of coordinating the national capacity building programme organizes a meeting with all relevant stakeholders where the scope of the self-assessment is discussed and agreed.
(2) The stakeholders complete their self-assessments to determine which capacities need to be developed and the actions to be taken, and return the results to the assigned organization within an agreed time.
(3) The assigned organization holds a follow-up meeting where each stakeholder presents a summary of its findings and a preliminary action plan for capacity building.
(4) The assigned organization produces a draft report containing an overall action plan for capacity building in nuclear security, and circulates it to the stakeholders for review and comment. On the basis of comments received, the final report is prepared as reference documentation for the capacity building action plan.

5.6. Action plans may be at the organizational level or the national level. In either case, all relevant stakeholders should have ownership of their action plans and ensure that they have the resources to complete the plans on the agreed schedule. Furthermore, in developing the capacity building action plan, it is

[2] The assessment of competence at the individual level for each function and respective organization is not covered in this publication.

necessary for the State to assign priorities based on the risks and perceived threats and the availability of local resources, both financial and human.

5.7. The table provided in Annex I could be used to determine which capacities need to be developed and which capacity building methods could be used. The table provided in Annex II could be used to determine which actions should be taken by respective organizations to develop their capacities. It should be noted that the tables in the annexes are illustrative, and therefore not exhaustive. As such, they should be used only as a general guide, not as a specific template.

DOCUMENTATION, IMPLEMENTATION AND PROGRESS MONITORING

5.8. It is suggested that the report of the self-assessment and the action plan for capacity building in nuclear security contain the following elements:

(a) A summary of the integrated analysis conducted by the government and organizations;
(b) A short description of the process and meetings that have taken place to conduct the self-assessment;
(c) Conclusions on the status of each element of the capacity building programme, including any actions identified for improvement;
(d) Action plans with the agreed completion times;
(e) Performance indicators or criteria for the success of each element of the action plan;
(f) A list of contributors to the report, including their positions and the organizations that they represent;
(g) References to any relevant materials used in conducting the self-assessment;
(h) Confidentiality requirements, if necessary.

5.9. The government should coordinate with relevant organizations to establish nuclear security capacity building objectives, develop implementation requirements and approaches and allocate resources according to specific needs and priorities. The assigned organization should monitor the overall progress of the capacity building programme and provide periodic updates on the status of each activity. Some organizations may be responsible for the development of multiple capacity building elements. The assigned organization may hold regular meetings with other stakeholders to review the progress of the implementation of the action plan. Organizations should also provide updates and feedback on capacity development to relevant organizations at the national level.

5.10. The State may consolidate the capacity building action plan and work with the IAEA to develop an integrated nuclear security support plan (INSSP). Such a plan should take into account any findings and recommendations from advisory services provided by the IAEA. The INSSP provides a platform for capacity building activities, whereby all assistance and support from all organizations and donors can be coordinated, thus optimizing the use of resources and avoiding duplication.

EVALUATION

5.11. Evaluation is the process of determining the value of a programme, course or other initiative, in order to continuously improve the effectiveness of that initiative. Within a nuclear security regime, evaluation can be used to measure the effectiveness of a capacity building programme, and to identify corrective actions to enhance the national level or organizational level capacity. This process helps to ensure that the State's strategic objectives are fulfilled and that capacity building efforts are continually reviewed in order to avoid degradation of the capacities. Well planned and well conducted evaluations serve three primary objectives:

(1) Evaluating the performance of capacity building programmes to identify areas for improvement;
(2) Identifying the most appropriate capacity building methods and topics for correcting any performance deficiencies;
(3) Evaluating the extent to which capacity building activities complement each other and are well integrated into the nuclear security regime.

5.12. In order to conduct evaluations of capacity building efforts, a variety of tools should be available to the evaluators. The tools used will depend in part on the type of evaluation being conducted and the target of the evaluation. Some of the tools that could be made available to evaluators include the following:

(a) Programme evaluation sheets;
(b) Face-to-face interviews;
(c) Participant comments;
(d) Individual pre- and post-training tests for comparisons;
(e) Assessment of action based learning, such as work based projects and role playing;
(f) Observations and feedback from peers, managers and instructors;
(g) Focus groups to gather information and share knowledge;

(h) Surveys among participants and trainers;
(i) Statistical software for job and system performance measures;
(j) Existing evaluation programmes;
(k) 'Red teaming' (use of a mock adversary for exercises).

5.13. This list, while not exhaustive, provides a starting point for the types of tool available for an evaluation. Evaluators are advised to continue the use of the tools chosen initially to allow more consistent comparisons over time, while subsequently supplementing them with additional forms of evaluation.

INTERFACES WITH NUCLEAR SAFETY

5.14. Nuclear security and safety have the common aim of protecting persons, property, society and the environment. Security and safety measures have to be designed and implemented in an integrated manner to develop synergy between these two areas and also in a way that security measures do not compromise safety and safety measures do not compromise security [1].

5.15. When building the capacity for nuclear security, there will be direct interfaces with nuclear safety. In addition, there may be interfaces with nuclear safeguards such as in nuclear material accounting and control. In practical terms, this means that there are likely to be many areas where building the capacity of regulators or operators can follow a common approach. In some cases, basic competences may be the same (e.g. using equipment for detection, and identification of radioactive material). In other cases, the individuals may be the same (e.g. inspectors having responsibilities in both safety and security). Furthermore, a person with an education and experience in nuclear safety may work in nuclear security or safeguards for some portion of their career.

5.16. A major interface where capacity building may overlap is in emergency management. Safety and security will both be major considerations in addressing nuclear or radiological emergencies arising from nuclear security events. Although preparedness and response for a nuclear security event is different from that for a nuclear or radiological emergency, the response arrangements need to have the capacity to work together seamlessly for the protection of the public and the environment.

5.17. In developing the capacity for nuclear security, some States may have existing competences and capabilities for nuclear safety at nuclear facilities. For example, the current education and training programme may already incorporate

courses on radiation detection, characterization and non-destructive assay. Some States may also have an existing laboratory for analysis of nuclear materials. States may utilize the existing resources to build the capacity for nuclear security.

5.18. As mentioned elsewhere in this publication, the capacity to implement a nuclear security regime rests largely in a State's laws and regulations, its organizations and the people in those organizations. Consequently, these also affect, either directly or indirectly, the implementation of safety and material accounting and control, especially at nuclear facilities. Therefore, the capacity that is developed at the regulatory and facility level should take into consideration how security will be applied and how this interfaces with other programmes such as safety. For example, if there is a single regulatory body for safety and security, then that regulator might share resources for its rulemaking, inspection and enforcement. These resources represent the capacity of the regulator to perform its duties.

5.19. As another example, a nuclear facility operator needs to implement all requirements for safety, security and nuclear material accounting. Therefore, it is most effective and efficient if the management systems, procedures and personnel at the facility are designed to take maximum advantage of shared facilities, equipment and resources and to work together to achieve their respective goals (to the extent possible, taking into consideration the differences between these areas). For example, there is existing guidance on nuclear security culture [8] and on safety culture [15], and the implementation of these shares many common features that should be considered when applying them to a State's organizations and facilities.

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Annex I

NUCLEAR SECURITY ESSENTIAL ELEMENTS AND CAPACITIES

Essential Element 1: State responsibility
Essential Element 2: Identification and definition of nuclear security responsibilities
Essential Element 3: Legislative and regulatory framework

National level

Capacities	Capacity building elements and methods	Target audience
Knowledge	Knowledge network: Develop or utilize knowledge networks for developing and enhancing a legislative framework by: — Participating in or hosting workshops; — Requesting IAEA support/missions specific to legislative issues; — Sharing best practices and case study information in developing legislation for nuclear security.	Policy makers
	Awareness: Seminars and conferences to review legislation related to nuclear security and identify gaps	Policy makers
Coordination	Awareness: Seminars and conferences that provide information about coordination and communication mechanisms across multiple competent authorities and organizations	Policy makers
Legislation	Education: Curriculum and educational resources that address policy making and specific topics, including security, science and technology, policy development, legislative process	Policy makers
	Awareness: Seminars, briefings and conferences that provide information about the essential elements of nuclear security	Policy makers

Legislation	Training: Workshops or practical training that focus on establishing competent authorities and assigning nuclear security responsibilities	Policy makers
	Training: Workshops or practical training detailing existing national laws and international treaties and agreements relevant to nuclear security	Policy makers
	Training: Workshops on legal drafting for nuclear security laws	Policy makers
	Organizational level	
Capacities	Capacity building elements and methods	Target audience
Knowledge	Awareness: Briefings, seminars and messaging that promote a strong nuclear security culture and reinforce the State's responsibility for securing nuclear or other radioactive materials	Competent authorities and authorized persons
	Education: Curriculum and degree programmes that address physics, nuclear power subjects, radiation health physics and other topics to develop expertise relevant to regulating nuclear or other radioactive materials	Competent authorities
Legislation	Awareness: Briefings, seminars and messaging that provide information about nuclear security roles and responsibilities, as defined by the State	Competent authorities and authorized persons
	Training: Practical or on-the-job training that provides information on legislation related to the security of nuclear or other radioactive materials	Competent authorities and authorized persons

International cooperation	Training: Practical or on-the-job training that provides information on international standards, agreements and obligations regarding the security of nuclear or other radioactive materials	Regulatory body
Coordination	Training: Practical or on-the-job training that details the coordination mechanisms across competent authorities and other organizations	Competent authorities
	Training: Workshops or practical or collective training that provide information about organizations with nuclear security responsibilities	Competent authorities
Regulatory control	Knowledge networks: Share best practices and case study information in developing regulations related to nuclear security	Regulatory body
	Awareness: Workshops or seminars that provide information on legislative and regulatory frameworks	Competent authorities
	Training: Practical and on-the-job training that addresses the processes for developing regulations, requirements and associated procedures for evaluating applications and granting authorizations or licences	Regulatory body
	Knowledge management: Appropriate inspection methods and techniques are preserved in a knowledge database to ensure that information and expertise are available for distribution and use by staff members	Regulatory body

Essential Element 4: International transport of nuclear material or other radioactive materials		
	National level	
Capacities	Capacity building elements and methods	Target audience
Legislation	Awareness: Seminar that raises awareness on legal framework on international transport of nuclear material and other radioactive materials	Policy makers
International cooperation	Awareness: Regional seminar on international cooperation on security in the transport of nuclear or other radioactive materials	Policy makers
	Organizational level	
Capacities	Capacity building elements and methods	Target audience
Regulatory control	Training: Workshops that provide knowledge of security requirements for the transport of nuclear or other radioactive materials	Relevant organizations
Coordination	Training: Table top exercise in coordination and cooperation during response to nuclear security event in the international transport of nuclear or other radioactive materials	Competent authorities

Essential Element 5: Offences and penalties, including criminalization		
	National level	
Capacities	Capacity building elements and methods	Target audience
Legislation	Awareness: Seminar that raises awareness of the prohibition and criminalization of malicious acts against a nuclear security regime	Policy makers
	Awareness: Meeting to enhance a State's commitment to international obligations in nuclear security	Policy makers
	Organizational level	
Capacities	Capacity building elements and methods	Target audience
Legislation	Training: Course that enables the participants to define offences or violations under domestic laws or regulations as those criminal or intentional authorized acts involving or directed at nuclear material, other radioactive material, associated facilities or associated activities	Competent authorities
Regulatory control	Training: A course that enables participants to develop risk based regulations on nuclear security	Regulatory body

Essential Element 6: International cooperation and assistance		
	National level	
Capacities	Capacity building elements and methods	Target audience
International cooperation	Awareness: Workshops that enable policy makers to contribute to the development of an integrated nuclear security support plan (INSSP)	Policy makers
	Awareness: To receive an Integrated Nuclear Security Advisory Service (INSServ) Mission to help the State review the general status of measures that protect against nuclear terrorism and identify ways to improve a broad spectrum of nuclear security activities	Policy makers
	Organizational level	
Capacities	Capacity building elements and methods	Target audience
International cooperation	Knowledge network: To participate in a knowledge network to share experience and best practices in prosecution of malicious acts against nuclear material, other radioactive material, associated facilities or associated activities	Competent authorities

Essential Element 7: Identification and assessment of nuclear security threats
Essential Element 8: Identification and assessment of targets and potential consequences
Essential Element 9: Use of risk informed approaches

National level

Capacities	Capacity building elements and methods	Target audience
Coordination	Awareness: Programmes and mechanisms to facilitate awareness of the multiple stakeholders and data required to generate threat, vulnerability and consequence assessments for risk analysis	Policy makers
Threat assessment and risk analysis	Awareness: Programmes and seminars to impart information about the results of a national threat assessment, including development of a design basis threat, where appropriate, and other regulatory requirements, design of nuclear security systems and measures, and development of other national instruments such as the national detection strategy and the national response plan	Policy makers
	Awareness: High level meeting to provide knowledge of possible threats, including insider threats, on the security of nuclear materials, other radioactive materials, associated facilities and associated activities, and to develop a national design basis threat	Policy makers
	Knowledge management: Establish procedures and documentation methods to develop and retain records, information and communications related to risk analysis, as appropriate. This facilitates the training awareness activities for policy makers.	Policy makers

Organizational level		
Capacities	Capacity building elements and methods	Target audience
Information security	Training: Specific training activities focused on information security and handling of sensitive information	Competent authorities and authorized persons
Threat assessment and risk analysis	Training: Specific training activities focused on reviewing and mitigating potential insider threats, including information about implementing a trustworthiness programme	Competent authorities and authorized persons
	Training: Practical training and workshops on how to document processes for identifying and addressing current threat information in its security plans or equivalent	Competent authorities and authorized persons
	Education: Academic curriculum on management and implementation of security systems and measures, to include specific nuclear security curriculum	Competent authorities and authorized persons
Technical measures	Education: Courses and certifications for the study of nuclear threats, consequences and risk analysis methods through academic programming	Competent authorities
	Training: Course to train participants to develop a national inventory system of nuclear materials and radioactive sources	Regulatory body

Technical measures	Training: Training focused on nuclear security systems and measures and a graded approach to implement prevention, detection and response capabilities	Competent authorities and authorized persons
	Training: Practical training on organizational development and function, implementation of Integrated Management Systems, and installation of equipment and systems to facilitate communication	Competent authorities and authorized persons

Essential Element 10: Detection of nuclear security events		
National level		
Capacities	Capacity building elements and methods	Target audience
Knowledge Coordination International cooperation	Awareness: Seminars, briefings, and informational materials related to nuclear detection efforts at all levels. Policy makers should have information pertaining to nuclear detection strategies, operations, relevant organizations and international engagement and assistance.	Policy makers

Organizational level		
Capacities	Capacity building elements and methods	Target audience
Coordination	Awareness: Seminars, briefings and informational materials related to nuclear detection operations, technologies, protocols and communication mechanisms available to all individuals with security responsibilities	Competent authorities and authorized persons
	Training: Table top and full scale exercise activities within an organization and with other organizations to reinforce skills development, validate policies and planning and evaluate operational activities for nuclear detection	Competent authorities and authorized persons
Technical measures	Workforce management: Dedicated resources and management for workforce planning necessary to staff frontline organizations with people possessing the necessary knowledge, skills and attitudes to accomplish the necessary tasks	Competent authorities and authorized persons
	Training: Practical training on how to operate nuclear detection equipment, including the appropriate concept of operations for the application of nuclear security	Frontline organizations
	Training: Table top and full scale exercise activities within an organization focused on nuclear detection plans, policies and procedures in a variety of operating environments and situations	Relevant organizations
	Knowledge management: Documentation of nuclear security equipment, training, operational procedures, maintenance and other records. This will ensure consistent operations and maintenance of technical detection elements.	Competent authorities and authorized persons

Essential Element 11: Planning for, preparedness for and response to a nuclear security event		
	National level	
Capacities	Capacity building elements and methods	Target audience
Knowledge Coordination International cooperation	Awareness: Seminars, briefings and informational materials related to response to a nuclear security event. Policy makers should have information pertaining to response plans, relevant organizations with response capabilities, and international cooperation.	Policy makers
	Organizational level	
Capacities	Capacity building elements and methods	Target audience
Coordination	Awareness: Workshops and seminars on roles and responsibilities for response to nuclear security events	Competent authorities and authorized persons
	Training: Practical, on-the-job and collective training on procedures and protocols related to response to nuclear security events	Competent authorities and authorized persons
Legislation	Awareness: Workshops and seminars to provide information about relevant laws and regulations pertaining to collection and handling of evidence within a nuclear security event	Competent authorities

Technical measures	Awareness: Workshops and seminars providing information about the responsible organizations, procedures and protocols for assessing nuclear security alarms and alerts	Competent authorities and authorized persons
	Training: Practical, on-the-job and collective training on procedures and protocols related to response to nuclear security events	Competent authorities and authorized persons
	Training: Table top and full scale exercise activities within an organization and with other organizations to reinforce skills development, validate policies and planning and evaluate operational activities	Competent authorities and authorized persons
	Awareness: Workshops and seminars to provide an overview of nuclear forensics and the necessary expertise to support technical nuclear forensics capabilities	Technical support organizations
	Workforce management: Dedicated resources and management for workforce planning necessary to staff frontline organizations with people possessing the necessary knowledge, skills and attitudes to accomplish the necessary tasks	Frontline organizations
	Education: Utilize and provide input for curriculum development, scholarships, fellowships and educational certification programmes to foster and promote development of technical expertise in nuclear forensics and detection related fields	Competent authorities and authorized persons

Essential Element 12: Sustaining a nuclear security regime		
	National level	
Capacities	Capacity building elements and methods	Target audience
Leadership Coordination International cooperation	Awareness: Conference, seminars and briefings to promote a national commitment to nuclear security at the highest levels and support a strong nuclear security culture at all levels: regionally, nationally and internationally	Policy makers
	Organizational level	
Capacities	Capacity building elements and methods	Target audience
Coordination	Training: Workshops or training activities focused on engagement across regional, national and international programmes to focus on best practices and methods for building, maintaining and continuously improving the human resources for a nuclear security regime	Competent authorities and authorized persons

Technical measures	Workforce management: Dedicated resources and management for workforce planning necessary to staff nuclear security roles within an organization	Competent authorities and authorized persons
	Training: Specific training in maintenance and calibration of nuclear security equipment	Technical support organizations
International cooperation	Training: Workshops or training activities focused on engagement across regional, national and international programmes to focus on best practices and methods for building, maintaining and continuously improving the human resources for a nuclear security regime	Competent authorities and authorized persons

Annex II

NATIONAL AND ORGANIZATIONAL CONDITIONS FOR CAPACITY BUILDING

National level			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
Education	Knowledge	Institutions for higher education are available to support development of the needed nuclear security expertise	Review the status of higher education system and discuss the need for specific curriculum on nuclear security
		Nuclear security is included as a part of higher education curriculum in the country, as appropriate	Identify a list of technical expertise and competences required for graduates of nuclear security education programme
		The needs for specific education programmes for nuclear security are identified and correctly addressed	Prepare education curriculum for nuclear security and share with all relevant organizations for feedback
		The possibility of international education on nuclear security is identified and its relevance to the national capacity building programme is evaluated	Evaluate the needs to participate in international education on nuclear security and arrange for relevant funding
Training	Technical measures	National training institutions are available to provide and leverage for a centralized training programme for nuclear security	Develop a plan to strengthen the existing institutions or to establish new institutions, as necessary, to anticipate the demand for trained nuclear security personnel
		A plan is developed to strengthen existing institutions or to establish new institutions, as needed	

National level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
Training	Knowledge	A national training curriculum is available in the relevant organizations to support the national nuclear security regime The training curricula are developed to support the roles and responsibilities of the organization The training curricula take into account the interfaces with other organizations	Propose standardized training curricula that meet the needs for competent staff in the relevant organizations Evaluate the existing and implemented training curricula on nuclear security and review whether the interface with relevant organizations has been addressed properly

National level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
Awareness	Coordination Legislation	A governmental organization is assigned to coordinate and implement national capacity building activities This should include assigning clear roles and responsibilities Needs assessment at the national level is undertaken to identify the gaps in the capacities needed to fulfil functions defined in Nuclear Security Fundamentals The relevant organizations, including competent authorities and operators, should be involved in the process of determining the needs related to the capacity building programme A coordinating mechanism is established to enable the relevant organizations to communicate their needs to the government	Responsible security agency/authority should prepare administrative arrangement to coordinate in building capacity for nuclear security Identify the relevant organizations, including the coordinating authority, that should be responsible for building national capacity for nuclear security (the relevant organization may include the key relevant competent authorities, operators, universities and technical and scientific support organizations (TSOs)) Define a mechanism to periodically discuss and update the plan and implementation of national nuclear security activities. It may be through hosting regular coordination meetings with the relevant organizations on capacity building for nuclear security.

National level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
	Knowledge	Programmes exist that promote awareness of nuclear security issues among the appropriate levels, governmental, organizational, individual and the general public This includes awareness of threats and consequences of theft, sabotage, unauthorized access and illegal transfer or other malicious acts involving nuclear or other radioactive materials and their associated facilities and associated activities. It also includes awareness on the need to protect for sensitive information.	Establish a programme to raise awareness of relevant organizations and targeted audience on the importance of nuclear security Address capacity building aspects in supporting the current working arrangement of relevant organizations in nuclear security
	Leadership Threat assessment	Recognize the need to establish national nuclear security capacities The capacity building programme has sufficiently long term planning considering all aspects of nuclear security	Devise national nuclear security strategy to address capacity building aspects
	Leadership	Allocate sufficient financial resources to achieve and maintain a nuclear security regime	Request budget proposal for capacity building activities to the relevant national financial authorities

National level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
	International cooperation	A governmental policy is in place to enable national organizations to cooperate with relevant international organizations/networks/stakeholders The needs assessment for capacity building takes into consideration international cooperation An integrated nuclear security support plan is established and updated regularly	Establish a governmental policy and guidance that enables the relevant organizations to cooperate with relevant international organizations/networks/stakeholders for nuclear security Identify field of capacity building programme that could be supported through international cooperation Implement the identified capacity building programme through international cooperation with a proper strategy to sustain at the national level

National level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
Workforce management	Leadership	Commit the availability of necessary human resources at the governmental level to achieve and maintain a nuclear security regime	Perform human resource needs assessment, in line with roles and responsibilities of the organization, and submit the result to the coordination agency Develop guidance on how to perform job requirements analysis and identify the required competences for nuclear security Perform job requirement analysis and identify the needed competences, and submit the result to the coordinating authority Evaluate the effectiveness of the implemented capacity building programme and submit the result to the coordination agency
	Coordination	Appropriate workforce management is available for attracting, training and retaining an adequate number of competent personnel for the needs of all governmental agencies involved in the implementation of a nuclear security regime Adequate resources are available for the implementation of the national programme for workforce management	Evaluate and identify the needs for additional resources to implement a workforce management programme and prepare relevant funding for implementation

National level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
Knowledge management	Knowledge	A knowledge management system is established among relevant governmental organizations to identify, store and disseminate knowledge generated during the implementation of a nuclear security regime Proper nuclear security terminology is established in order to have common understanding among the relevant organizations in implementing a nuclear security regime Community of practice in nuclear security is established	Identify best practices programme as an essential tool for knowledge management and develop it on a national level Identify knowledge management values (leadership, knowledge sharing environment, culture) and undertake measures to preserve them Promote the establishment of a community of practice in nuclear security to create a pool of experts
Knowledge networks	Knowledge	National capacity building centre, e.g. in the form of a nuclear security support centre (NSSC), is established for supporting the implementation of a nuclear security regime The TSOs are identified and involved in implementing a nuclear security regime Exchange and sharing of knowledge, experience and good practices are conducted via knowledge networks	Establish national capacity building centres to support the implementation of a nuclear security regime Identify targeted audiences and training needs Identify and invite the relevant TSOs to support the implementation of a nuclear security regime Leverage existing capacity building infrastructure to support knowledge network activities

National level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
	International cooperation	The government and any other relevant organizations in the Member State participate in the knowledge networks of nuclear security (e.g. NSSC and the International Nuclear Security Education Network (INSEN)) to support capacity building programme	Promote the participation of the government and relevant organizations to participate in various knowledge networks on nuclear security, including the IAEA's NSSC and INSEN Devise a mechanism to disseminate discussion in NSSC Network and INSEN to enhance national capacity building programme Develop and maintain e-learning web site to promote capacity building in nuclear security

Organizational level			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
Organizational infrastructure	Leadership	A formal capacity building programme should be established for each organization to address the capacities needed to fulfil its nuclear security functions	Establish a capacity building programme for nuclear security, approved by the management
		Capacity building aspects for nuclear security are addressed in organizational long term plans	Ensure that capacity building is thoroughly addressed in the 5-year strategic plan
	Coordination	A unit is established within the organization to coordinate and implement capacity building activities with other national or international partners	Coordinate and implement capacity building activities for nuclear security and engage all units of the organization
		The relevant units are involved in the process of determining the needs related to the capacity building programme for nuclear security	Prepare the budget for capacity building programme, taking into account the feedback from relevant units of the organization
		The proper channels to communicate to the relevant governmental organizations are established	Establish a strong liaison for the coordinating agency and regularly participate in its meetings in capacity building programme
			Evaluate the effectiveness of the capacity building programme based on the pre-defined performance indicator

Organizational level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
	International cooperation	The need for international cooperation in capacity building is included in the needs assessment Organizational action plans for international cooperation have been established The capacity building programme is supported by the appropriate international cooperation framework	Evaluate the need for an international cooperation programme for capacity building, taking into account the feedback from the relevant units Develop an action plan for capacity building in nuclear security Develop the required legal framework for a cooperation arrangement with international counterparts, with the approval of the Ministry of Foreign Affairs
Education	Knowledge	Access to higher education to obtain properly qualified individuals for nuclear security is available	Assess the need for a university level professional development education course on nuclear security
Training	Technical measures	The organization establishes a training programme to fulfil the needs for competent staff to support nuclear security The organization possesses its own training facilities to support its capacity building activities, as needed	Management to provide support for the development of training facilities, as necessary, if national facilities do not exist Identify the necessary national expertise and equipment for training

Organizational level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
		The organization develops qualified in-house trainers to support its roles and responsibilities in nuclear security The organization develops tailored training curricula to support the training programme The organization has formal arrangements with other national educational and training institutions to address relevant needs and support A field exercise is performed whenever relevant as a part of the training programme	Acquire external trainers as necessary or send staff to external training Identify and promote the development of the necessary national expertise for training Set up training programmes based on the systematic approach to training advocated by the IAEA
Awareness	Leadership	The organization establishes an awareness programme for relevant individuals who do not have direct roles and responsibilities in nuclear security	Management to make sure that awareness building for its staff is part of its overall operations strategy
Workforce management	Leadership	The organization develops a recruitment procedure to ensure the qualifications and capabilities of its personnel	Organizations must have one or more persons responsible for workforce management to make sure that the appropriate staff are hired and maintained

Organizational level (cont.)			
Capacity building element	Capacity	Conditions needed	Suggested plan of action
	Coordination	The organization performs a human resource needs assessment based on the national nuclear security regime in the country	Obtain qualified experts in performing an objective needs assessment
	International coordination	The organization uses the IAEA and other relevant tools to assess the staff's competence and training needs	Involve the relevant IAEA staff
Knowledge management	Knowledge network	Knowledge management system is established within the organization to identify, store and disseminate during the implementation of nuclear security measures	Obtain qualified experts in knowledge management Utilize IAEA resources (e.g. Technical Cooperation Programme)
Knowledge networks	International coordination	The organization participates in regional, national or international knowledge networks, to support its capacity building activities	Utilize IAEA and other international resources

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ISBN 978–92–0–111916–2
ISSN 1816–9317