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FOREWORD

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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 country, 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 Agency’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 world-wide.
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1 INTRODUCTION

1.1 BACKGROUND

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 threat. Because of their widespread use, nuclear and other radioactive materials are vulnerable to sabotage, 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.

The objective of a State’s nuclear security regime is to prevent, detect and respond to such nuclear security events [1], to protect persons, property, society and the environment from the harmful consequences of nuclear and other radioactive materials. An effective national nuclear security regime builds on the implementation of relevant international legal instruments, information protection, physical protection, material accounting and control, prevention of, detection of and response to malicious acts involving nuclear and other radioactive material; national response plans, and contingency measures [1].

The importance of a nuclear security regime is recognized in the Nuclear Security Fundamentals and the three Nuclear Security Recommendations publications [1–4].

States that are in the process of developing their infrastructures to support future nuclear activities, such as constructing their first nuclear power plant, are most likely to be interested in capacity building activities. These States typically have less developed processes and structures to manage nuclear security and are therefore in the greatest need of capacity building. The elements of developing the security is 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]. Ref. [5] provides a phased approach to implementing the infrastructure for a nuclear security regime, and this publication may be used in conjunction with it.

Building the capacity of organizations and people to develop, implement, and sustain a nuclear security regime is an essential responsibility of a State. Analysis of national nuclear security needs and existing infrastructure should drive the development of capacity building programmes to prevent and combat the threat of sabotage or the use of nuclear and radioactive materials for malicious acts, and to prepare effective response measures to nuclear security events. Capacity building for nuclear
security should also be integrated with efforts for achieving the safe, secure, and peaceful use of nuclear energy.

The fundamental goal of capacity building is to enhance the abilities of relevant stakeholders to assess and implement nuclear security regime. The infrastructure required for capacity building include trained manpower for nuclear security trainings and educational institutes, establishment of technical support centres, availability of nuclear security labs and equipment, availability of appropriate course materials and documents etc.

In addressing how to build the capacity to 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 should be tailored to the national infrastructure and resources that are available. As a basis for planning capacity building, the State should determine the organizations, equipment, technical facilities, and human resources and competences needed to achieve these essential elements in a manner appropriate to the particular circumstances of the State.

1.2 OBJECTIVE

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 implement an effective nuclear security regime. The roles of governments, organizations, and individuals for capacity building are defined and key elements of capacity building programmes are detailed. Methodologies are provided for using a systematic approach to developing capacity building programmes.

1.3 SCOPE

This Implementing Guide is 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. 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 material out of regulatory control.

The term “capacity” in this publication refers to an organization or individual (i.e. the human element) that has both the competence (knowledge, skills, and attitude) and capability (resources, authorization, process, equipment, and means of deployment) needed to achieve their desired goal. Capacity building for nuclear security is defined for the purposes of this publication as a systematic approach to education, training, exercises, enhancing awareness, workforce management, knowledge management and use of knowledge networks to develop and continuously improve the governmental,
organizational and individual competences and capabilities necessary for establishing 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.

Human, technical and financial resources are necessary to ensure effective nuclear security. Infrastructure, equipment, and other physical elements support the implementation of 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] — but instead focuses on the development and sustainment of governmental, organizational and individual competences and capabilities.

1.4 STRUCTURE

Section 2 of this publication discusses the roles and responsibilities for capacity building and Section 3 discusses 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

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

— Governmental roles: Policy makers at the national level should enable capacity building by establishing the policies and frameworks within which organizations and individuals operate. States should clearly assign responsibilities and facilitate effective coordination mechanisms for national competent authorities and organizations that are responsible for implementing the nuclear security regime. The State should also allocate resources for its effective implementation;

— Organizational roles: Competent authorities and organizations involved in nuclear security should develop nuclear security capacity building programmes for management, personnel, and stakeholders that address relevant nuclear security systems and measures for their missions and mandates. This includes fostering coordination and cooperation between organizations both within and outside of the nuclear security regime. Organizations should
communicate with the government about the resources and infrastructure needed to develop the capacity to implement nuclear security measures; and

— Individual roles: At the individual level, persons with responsibilities for nuclear security should develop knowledge, skills, and capabilities for nuclear security by leveraging educational, training, exercise, and awareness-raising activities. Additionally, individuals may benefit from utilizing workforce management and knowledge management efforts and knowledge networks for nuclear security.

The detailed functions and competences needed for the implementation of the State’s nuclear security regime, derived from the Nuclear Security Fundamentals [1], require specific capacities in order to ensure effectiveness. These are listed in Annex I.

2.1 ROLES OF GOVERNMENT

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 the competence of all stakeholders that have responsibilities within the State’s nuclear security regime is built and maintained, so that the State can achieve its nuclear security objectives.

The distribution of the government responsibilities in a State will depend upon the existing legal, governmental and organizational arrangement. The State may take into account international guidance and best practices.

The State should ensure that there are sufficient human, financial, and technical resources within the government and organizations, and an appropriate number of capable individuals within the State is available to successfully develop, 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.

Specifically, the government should:

— Acknowledge its central role in building the capacity of the State’s organizations and individuals to implement an effective security regime. This includes developing appropriate strategies and coordinating with all relevant stakeholders;
— Provide within its legal framework the basis for the formulation and implementation of programmes that build the capacities needed to implement an effective nuclear security regime;

— Establish the roles of different organizations and assign the nuclear security responsibilities set out in the Nuclear Security Fundamentals [1] to ensure effective and efficient implementation of programmes tailored towards a high level of national nuclear security, and provide for effective coordination between these organizations;

— 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;

— Assess national-level needs for capacity building, including evaluation of national education resources and training infrastructure to support the human resources development needed for the nuclear security regime;

— Facilitate awareness of State nuclear security plans, policies, and strategies for audiences at the national, organizational, and individual levels, as appropriate;

— Promote the concept of knowledge management and the exchange of knowledge to support building capacity for nuclear security;

— Identify competences necessary for executing nuclear security responsibilities that may require verification of expertise, knowledge or skills through a qualification, accreditation, or certification programme;

— Ensure that mechanisms are in place to facilitate cooperation, to monitor organizational development among all organizations important for the State’s nuclear security regime and to enable organizations to feedback issues of national concern to the government; and

— Ensure that mechanisms are in place at the national level that enable organizations to cooperate with relevant international organizations and networks.

2.2 ROLES OF ORGANIZATIONS

Organizations assigned with nuclear security responsibilities include competent authorities and institutions that specifically deal with the protection of nuclear and other radioactive materials, and other organizations, such as law enforcement or security organizations with specific security roles and functions. Organizations may develop their own nuclear security capacity building programmes and also may rely on the capacity building programmes implemented at the national level. Specific
nuclear security responsibilities attributed to various organizations may require specialized knowledge
or expertise that necessitate education, training, knowledge management, and qualifications to ensure
that adequate capacities are developed within individual organizations or at the national level to
ensure there are personnel with the appropriate competences. To ensure a systematic approach to
capacity building, organizations should:

— Develop short, medium, and long term workforce plans to identify their overall human
resource needs and related requirements;

— Communicate overall needs on national nuclear security to the government to ensure the
adequacy of programmes for building capacity at the national level;

— Provide feedback to the government on any identified gaps or deficiencies in existing
arrangements for capacity building;

— Work closely with other organizations within the State for building capacity for nuclear
security, to include such as education and training institutions, to improve the quality of the
national nuclear security plan;

— Facilitate awareness within the organization of nuclear security issues and related capacity
building efforts;

— Develop and implement, as part of their management system, a systematic approach to
capacity building within the organization to ensure the competence of personnel; and

— Establish mechanisms to monitor the performance of their personnel and promote feedback at
the individual level to identify competence gaps or necessary improvements in personnel
training.

2.3 ROLES OF INDIVIDUALS

Any individual assigned with roles and responsibilities for nuclear security is expected to cooperate in
and contribute to building their own individual competences as well as the collective competences of
their organizations. Individuals working in nuclear security need to understand the overall objective
and strategy of nuclear security implementation within their organizations and be able to effectively
communicate to the organization their observations and experiences for continuous improvements and
effective implementation.

Individuals involved in national nuclear security programmes should contribute to the creation of
national expertise and resources that will ensure continuous availability of the necessary knowledge of
nuclear security in the State.
Such individuals should therefore accept and be committed to building their competences by making themselves available to the established and available programmes of continuous 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

Capacity building consists of several key elements, including education, training, exercises, awareness development, workforce management, knowledge management, and knowledge networks. Education, training, and exercise activities build capacity by facilitating the acquisition of expertise and skills for new and existing professionals to master the principles and technologies associated with the security of nuclear and radioactive materials, as presented in Sections 3.1 and 3.2. In building capacity for nuclear security, awareness efforts that target multiple audiences support understanding of the importance of protecting nuclear and radioactive materials, as described in Section 3.3. Additionally, workforce management, knowledge management, and knowledge network concepts support the development, recruitment, and retention of personnel with the requisite skills, expertise, and competences to strengthen nuclear security, as described in Sections 3.4, 3.5 and 3.6.

3.1 EDUCATION

Nuclear security education as described in this publication includes curricula, individual courses, and other formalized instructional activities conducted through educational institutions. Educational programmes in nuclear security should aim to establish in-depth knowledge and foster a nuclear security culture [8] in a country or region. Ideally, specialized education on nuclear security should be provided for persons interested in pursuing a career in nuclear security, as these educated individuals are expected in the future to design, develop, 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.

Before embarking on any educational programme, an assessment of the State’s education needs in relation to nuclear security may be conducted as a part of the initial set of tasks during the establishment of the national policy and strategy.

The process of determining educational needs may include evaluation of the current capabilities of existing academic facilities and technical education institutions, to ensure that the expertise exists to provide the necessary instruction related to the security of nuclear and other radioactive materials. A
comprehensive plan for either 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. For structured formal education programmes, curriculum development is an important consideration for achieving awareness-building goals. The curriculum for nuclear security education programmes should be collaboratively developed by relevant stakeholders, which could include law enforcement and military academies, other designated nuclear security implementers, and universities and national research institutions.

Education programmes may be tailored to suit the needs of the organizations responsible for implementation of nuclear security in the State including, but not limited to, the regulatory bodies and other competent authorities, law enforcement agencies, and operators. The State may pursue cooperation with other States and international organizations to provide insights into the competences and resources necessary for implementing the national nuclear security education programme. Prior to the development and implementation of education curricula, it could be useful to use opportunities for education in institutions in other States, either by sending students abroad to gain experience, or by employing nuclear security specialists from other States to provide academic and practical education.

The educational programme suggested in IAEA guidance [9] should be considered as a technical aid to facilitate the development of a comprehensive nuclear security education and human resource development programme for a specific State. The guidance in Ref. [9] can assist in building and maintaining relevant knowledge and skills, and sustaining the pool of qualified personnel to deal with future nuclear security challenges. Although Ref. [9] primarily addresses the development of a university (Masters) degree programme, the provision of other educational opportunities should be considered as well. Occupational education programmes in nuclear security related fields may also be part of the curricula for technical or vocational institutions providing undergraduate degree 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 institutions of higher learning to the nuclear industry.

3.2 TRAINING

A well-trained workforce is needed to contribute to the establishment and maintenance of an effective nuclear security regime. Select members of this workforce may act as subject matter experts in developing more extensive training and educational materials and serve as resource persons in expanding the national capacity for nuclear security.

Training is defined as an organized activity aimed at imparting implementation-specific procedures to help recipients improve performance or attain and maintain a required skill level. Comprehensive
Training programmes can improve the efficiency of and strengthen the State’s nuclear security capabilities by:

— Developing practical and operational knowledge and skills for various stakeholders;
— Improving and sustaining operational readiness in response to evolving missions, threats, and technologies;
— Strengthening multi-jurisdictional and multi-national coordination, communication, and partnerships (as appropriate);
— Clarifying organizational structure, roles, responsibilities, and authorities; and
— Sustaining interconnection with awareness and exercise programmes within a nuclear security culture.

Training, both knowledge-based and skill-based, should be carefully designed to ensure its quality and its effectiveness for the personnel being trained. Determining what needs to be taught in training programme is critical to this process. This is accomplished through following a systematic approach to training (SAT), which comprises five basic activities: analysis; design; development; delivery; 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.

In building capacity for nuclear security, training programmes at organizations should aim at filling gaps between the actual performance of personnel working in an area of nuclear security and the required knowledge and skills needed to meet national requirements and international obligations (such as those arising from conventions) and to follow IAEA guidance relating to nuclear security.

Based upon the assessment of training needs, training may be designed and developed using different platforms to accomplish identified learning objectives. States can apply several potential training mechanisms as part of a SAT:

— Traditional and Practical Training: Many States implement training that includes a mixture of both traditional methods (classroom style education) and experiential learning (or practical, hands-on training that can be linked to specific modalities or threats). Traditional training includes the use of textbooks, educational films, and equipment demonstrations. Practical training for nuclear security may include hands-on training with relevant equipment; practice of security functions, and practice using analysis software. A mock or model facility, such as a gateway, port, or inspection station, may prove useful for this practical training.

— On-the-Job Training: Because training can require a significant amount of time at off-site locations, many implementing organizations rely on on-the-job training for their personnel.
On-the-job training and practice is also valuable in promoting skills and intuition about inspection. On-the-job mentorship by an experienced officer can add a broader context for the 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 have specific equipment, but may have sufficient situational awareness through their intuition and observations (to identify anomalies with documentation, such as manifests, bills of sale, and invoices, and with conveyances, conveyance operators, or containers) to seek additional assets or assistance in resolving the situation.

- Virtual Training: Like train-the-trainer strategies (discussed below), virtual learning can help minimize costs and disruptions to operations by making training more accessible to personnel. Virtual training can be of several types, including e-learning (i.e., a computer-based training class), response simulators, and virtual reality. However, it is important to keep in mind that not all training topics lend themselves to a virtual environment.

- Collective Training: For several types of learning, an individual is trained towards his or her specific tasks in isolation. Collective training may be a valuable complement to individual training by offering opportunities for collaborative learning. In such opportunities, participants are dependent on each other’s skills and resources to maximize the learning. Collective training is likely to involve extensive interaction, accountability to other participants, and engagement in common tasks.

  - For example, collective training could include cross-disciplinary training on nuclear detection that brings together regulatory authorities and frontline officers to facilitate joint training and understanding of regulations, operational procedures, and response protocols for nuclear materials out of regulatory control.

- Train-the-Trainer: Methods such as train-the-trainer can help manage the often-high costs training and maintaining the skills of personnel. Under this model, one person is selected to become an expert by attending a new or refresher training class. This person subsequently returns to serve as a local trainer for the rest other nuclear security personnel. This method allows for the quick and efficient dissemination of critical skills and knowledge across the nuclear security regime.

Training is generally focused on learning a new skill or improving performance for a specific job. Fundamentally, a systematic approach to training (SAT) should help to provide in all cases the training that is needed to address performance needs that fit within the established competence framework. The first step of the SAT is to determine the training needs of the target audience. This is
an expansive task that involves analysis of the performance requirements (i.e., duties and tasks) of
individuals that 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 require formal training) and which are less critical (and
therefore may be learned through other means, such as on-the-job training, and reading assignments). Training objectives are formulated based on these critical tasks and organized into a logical
progression of lessons designed to ensure mastery of each lesson’s objectives. Once designed, the
content of each lesson is 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. At each step
in the process, the activities performed and the products developed are evaluated. Not only does this
measure the internal validity of the training as it is being developed, but the evaluation also
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
systematic approach to training in detail and its application in a range of areas [10–12].

Effective training is necessary to build a cadre of expertise that will serve nuclear security programme
managers, directors and technical experts, and will eventually train developers and instructors 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 must identify the various training topics that must
be taught, the mechanisms to implement the training, which will provide the training, and training
frequency. Defining each of these elements prior to implementing any training programme will
support building nuclear security capacity and competences in a sustainable fashion. Training courses
offered through the IAEA, and support offered through other international programmes and regional
resources (such as Nuclear Security Support Centres), may be of assistance in developing a
comprehensive capacity building effort. However, developing a cadre 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 require the training of personnel to
become both curriculum developers and training instructors.

In addition to planning for SAT and developing or implementing the appropriate training curricula,
facilities and infrastructure may be necessary to support capacity building. Training facilities should
be created either on a national, regional or organizational scale to ensure that training can be
effectively delivered.
### 3.2.1 Exercises

Nuclear security exercises are activities that are conducted to validate and evaluate policies, plans, procedures, equipment, operations, and other types of training. The use of exercise activities will provide tools to enhance organizational readiness and develop the processes and procedures to evaluate and monitor the performance effectiveness of detection and response systems. Planning and implementing nuclear security exercises provide a means to build capacity, assess capacity building needs, and evaluate the effectiveness of capacity building efforts.

Exercises can be utilized as learning events to facilitate greater operational understanding of how nuclear security capabilities 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:

- Assembling organizations and individuals with different roles, responsibilities, and authorities to work in coordination to maintain and practice skills, capabilities, and procedures;
- Informing, motivating, and promoting confidence to those responsible for nuclear detection and response;
- Evaluating and validating strategies, procedures, operations, equipment, training levels, and awareness efforts;
- Identifying gaps and areas of vulnerability for nuclear security systems and measures; and
- Testing new ideas, scenarios, and technologies for nuclear security.

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

- Scoped appropriately to the size and maturity of the nuclear security regime;
- Planned and organized with relevant stakeholders to promote effectiveness;
- Integrated with other missions to leverage resources;
- Designed to continually assess and improve practices;
- Evaluated to facilitate assessment of capacity building efforts and; facilitate development of improvement plans, if necessary; and
- Supported by effective communication about exercise planning, execution, and outcomes.

Utilizing a defined exercise methodology based on a time-based process to organize critical exercise events, tasks, and considerations ensures the conduct of exercises that will support capacity building by allowing participants and organizers to build and practice skills through exercise play; identify
areas where additional training, education, or awareness may be necessary; and or assess the
effectiveness of capacity building programme elements.

There are two basic categories of exercises for nuclear security:

— Table Top Exercise (TTX): Primarily discussion-based events designed to evaluate existing
processes (plans, policies, and procedures) at the intra-agency, interagency, or regional level.
TTXs provide realistic scenarios including an evolving sequence of variants (injects) that
probe processes and communications. The movement of field personnel and equipment is
simulated. TTXs can be used to identify and assess awareness, knowledge, or policy
competences and may be developed as a preparation step to a Field Training Exercise (FTX).

— Field Training Exercise (FTX): Primarily operations-based events designed to evaluate
individual and collective capabilities at the intra-agency, interagency, or regional level. An
FTX engages field personnel and assets in response to realistic scenarios in a manner that
closely mimics the stress and practical constraints of an actual incident. An FTX may be used
to identify gaps in training, organizational response, and procedures in near-real-time.

When considering exercises to support capacity building, it is helpful to outline the phases of the
exercise, including initiation, exercise planning and design, preparation for the event, running the
exercise, wrap-up activities, evaluation, and finally, after-action reports and improvement plans. By
developing various phases, planners can more accurately identify the various elements of the exercise,
including decisions on the types of exercises to consider, the participants, and the process for running
the exercise. In addition, the evaluation and subsequent after-action report and improvement plan will
ensure that capability, skills, and knowledge strengths and weaknesses identified during or after the
exercise will be corrected to continually improve capacities for nuclear security.

3.3 AWARENESS RAISING

Awareness raising differs from education or training in that its objective is limited to making the
target audience cognizant of a particular condition, event or issue rather than providing broad
knowledge or accomplishment of a specific task. Nuclear security awareness can be defined as a
foundational state of knowledge about nuclear security and the associated set of beliefs regarding
nuclear threats, nuclear security systems and measures, and organizational roles and responsibilities.
Awareness is fully achieved when stakeholders at all levels (national and organizational as well as the
public\(^1\) internalize information regarding nuclear security and develop the desired behaviours and beliefs appropriate for their situations. Awareness programmes are less formal than education or training in the method of development, delivery or measurement of effectiveness. The implementation of awareness programmes needs to be carefully conducted in order to take into account the requirement for protection of sensitive information related to nuclear security systems and measures based on the need to know basis.

In order to establish a strategy for developing an awareness programme, goals and objectives should be established to better focus awareness efforts, to include the following:

- Providing individuals with knowledge and guidance of their roles and responsibilities, which can improve operational readiness in case of nuclear security event;
- Providing foundational knowledge (e.g., information on nuclear material threats, nuclear detection options, and operations) for building a nuclear security culture. This knowledge base allows for advanced training and a broader understanding of one’s mission;
- Fostering the development of political will of government entities and organizations. This political will is critical to building and sustaining nuclear security capabilities and programmes. It is believed that internalizing nuclear security will also help legitimize activities; and
- Promoting a common terminology and basis for raising awareness with the general public and other non-governmental organizations.

To accomplish these goals and objectives, States can draw on a core set of guidelines and principles for planning, developing, implementing, and sustaining effective nuclear security awareness:

- Communicate the need for nuclear security efforts;
- Include a core set of themes;
- Develop awareness for all roles and audiences;

\(^1\) Ref. [7] defines public awareness as follows: 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.
— Customize efforts to specific audiences;
— Plan and organize to promote effectiveness;
— Establish awareness as a continuous process; and
— Evaluate awareness efforts regularly and update as necessary.

In building capacity for nuclear security, awareness programmes are primarily implemented 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 raising awareness may be needed.

Awareness programmes may be particularly relevant for the public, in general or with emphasis on a particular targeted group, such as people whose work could potentially lead to them encountering nuclear security events, such as scrap metal dealers. Such programmes can be put in the context of broader public awareness programmes, such as those covering hazardous materials or public health, or general security awareness. However, care should be taken not to cause undue concern or trigger an irrational response when engaging in awareness campaigns targeting the general public regarding nuclear security. Thus the public awareness programme should be carefully designed and systematically implemented to ensure that the programme meets its objectives.

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 safety related facts associated with nuclear and other radioactive material. Part of this awareness raising should describe the safety and security measures that are in place to protect the public with respect to protect sensitive information.

Awareness campaigns targeting the public may be communicated through major media outlets, such as television, radio, and newspapers. It may also take the form of public seminars, meetings and roundtables. Information dissemination as a part of an awareness programme may be delivered by any means such as pamphlets, banners, or via the Internet.

Awareness raising programmes aimed at policy makers are important for competent authorities, especially those involved in the development and implementation of the nuclear security regime. Awareness is necessary to drive governmental support for the implementation and sustainability of nuclear security measures. Within government organizations, awareness campaigns are necessary to ensure that policy makers, regulatory bodies and other governmental elements are aware of the importance of securing nuclear and other radioactive associated facilities and associated activities. Government personnel across 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 promotes coordinated planning at the national level and allocation of resources for nuclear security activities.

The operators and authorized persons that use, process or store nuclear and other radioactive material, nuclear security awareness programmes should be developed and implemented for all personnel, regardless of job duties. For operators, the principal objectives of increased awareness are to provide individuals with the knowledge of and guidance on their roles and responsibilities, and those of others, to improve operational readiness in case of a nuclear security event or a situation that could increase vulnerability to a nuclear security event, and to provide foundational knowledge for building a nuclear security culture.

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

Mechanisms for delivering awareness may include methods that help transfer knowledge and beliefs and that can be supported by entities or partnerships that include government, academia, media, non-government organizations, and industry other nuclear. Just 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.

3.4 WORKFORCE MANAGEMENT

Ref. [3] specifies that it is the responsibility of a State to facilitate competent authorities and other organizations with nuclear security responsibilities to develop a long term strategy that secures a sustainable supply of competent human resources. They should allocate sufficient human, financial and technical resources to carry out their strategies and fulfil the organization’s nuclear security responsibilities on a continuous basis [1].

The following elements should be incorporated into workforce management strategies.

— Workforce planning;
— Career management; and
— Performance management.
Since nuclear security requirements are determined in accordance with a national policy and its nuclear infrastructure, the required 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 built on the needs of the State and should facilitate the advancement of nuclear security knowledge and skills within a State. All authorities and organizations responsible for nuclear security should be involved in the needs assessment and in the subsequent development of the tailored strategy of workforce management at both national and organizational levels. Suggested self-assessment questions for a needs assessment are provided in Annex II and a generic action plan for capacity building is provided in Annex III, for reference for the development of workforce management strategies.

3.4.1 Workforce planning

Workforce planning involves addressing both short term and long term needs for continuously fulfilling nuclear security responsibilities. It needs to consider the whole employment cycle, from recruitment to retirement, and succession planning to connect these two ends.

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

The provision of stable and secure employment area may serve, in some States, as a powerful incentive to be continuously committed to meeting nuclear security requirements. This feature may also support knowledge management, which is discussed further in Section 4.5.

3.4.2 Career management

Career management includes continuously motivating personnel responsible for nuclear security measures to achieve higher performances in their areas of responsibility. Providing appropriate remuneration commensurate for an employee’s contribution is a good practice. rewarding an employee’s outstanding performance could also serve to encourage the workforce to improve their performance and to contribute to achieving nuclear security objectives.

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

Performance management is part of workforce management and includes periodic performance evaluations. Particular focus in these periodic evaluations should be placed on identifying possible gaps between expected competence and actual performance.

Since various levels of required skills and competences are involved in nuclear security performances, some skills can be achieved relatively quickly, but others take more time. This uneven skill development needs to be evaluated from a long term perspective and periodically reviewed to determine whether the situation is improving or meeting the timelines specified in these strategies.

If underperformance is found to have resulted from functional deficiencies in the workforce management programme, a thorough analysis should be carried out to identify the sources of these deficiencies and correct them. These sources 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.

3.5 KNOWLEDGE MANAGEMENT

Nuclear security related knowledge needs to be appropriately managed in order for it to be used to effectively build capacity in the area of nuclear security. The experience, skills and knowledge acquired in an operating nuclear security system should be transformed and shared among different actors within the nuclear security system to achieve better performance. It should also be preserved in a proper manner to ensure efficient transfer to individuals newly assigned to tasks and responsibilities in order to continuously meet nuclear security requirements. Therefore, knowledge management should be an integral part of capacity building programmes and needs to be aligned with workforce management strategies.

Knowledge management is defined as “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 orchestrating related methods 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 basic processes:

— Identification of knowledge needs;

— A process for acquisition of the necessary knowledge;

— Further transformation of the acquired knowledge for specific needs, its dissemination to the different actors of the nuclear security system; and
— Preservation of the knowledge for future applications.

Identifying what knowledge needs to be managed for capacity building purposes should be the first important process in a knowledge management cycle. The knowledge identified may be explicit, such as technical information on paper or in electronic media, or it may be tacit, such as experience-based insights and skills embodied 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.

The acquired knowledge then needs to be transformed and interpreted to be used for specific capacity building needs. The transformation of knowledge could be performed through the development of implementation plan that will allow new nuclear security knowledge to be applied tailored to national situation and arrangement. While, the interpretation in this context could involve specifying what elements of the knowledge need to be used for what purposes, such as problem solving, new technology development, or decision making to achieve desired nuclear security performances.

After the transformation process, the knowledge needs to be disseminated to people with the need to know to meet nuclear security objectives. Channels for knowledge dissemination need to be defined and optimized to ensure that the knowledge has reached and been understood by the intended recipients.

Knowledge preservation is a vital component of the knowledge management cycle and is critical to maintaining and continuously improving the capacity level of a nuclear security system. Knowledge preservation requires a system with the ability to archive, retrieve and protect the acquired knowledge, and to maintain the usability of the knowledge for future applications.

Knowledge management needs to focus on organizational knowledge as well as individual knowledge. In this regard, a knowledge management system needs to be established at an organizational level. The State needs to promote its establishment within organizations with nuclear security responsibilities in the State.

There are other roles that a State may assume with regard to knowledge management for nuclear security capacity building purposes. One such role could be to create a national database for certain kinds of knowledge with the purpose to advance national capacity building efforts. One example of a national database for the knowledge management with capacity building applications is the database of nuclear security terminology. Establishment of a nuclear security terminology database may be useful to ensure that the nuclear security officers of all relevant organizations have the same understanding of each nuclear security function and role as well as to facilitate capacity building effort for new comers in nuclear security responsibilities.
Another example is a database of nuclear security personnel with common roles. Nuclear security related knowledge refers to various aspects of nuclear security performances, including procedures and technical skills for physical protection measures and good practices for each element of nuclear security responsibilities. Accordingly, the validity, usefulness and usability of particular knowledge differ from recipient to recipient, depending on the roles that each recipient assumes in a national nuclear security system. This suggests that sharing knowledge can be beneficial if acquired and preserved knowledge is shared among those who have common roles in a nuclear security system. In this regard, the database of nuclear security personnel with common roles could be useful to enable an effective dissemination of the necessary knowledge among those with same roles in national nuclear security system in order to advance national nuclear security objectives.

3.6 KNOWLEDGE NETWORKS

Knowledge management can be supported through the development and utilization of knowledge networks. Knowledge networks include the collection of people with nuclear security knowledge and serve as a platform to enable the analysis and sharing of nuclear security related expertise and experiences to supplement efforts to build national nuclear security capacity. Knowledge networks can be established at both national and international levels.

Knowledge networks for nuclear security at a national level could serve as the collection of people to meet the need of human resources to build national nuclear security capacity. For example, the pool of graduates of Master of Science programmes in nuclear security in a State might represent the list of capable people who are ready to serve as nuclear security officers in national authorities and 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 consist of various groups with different specializations, including, for example, analysis of national nuclear security policies, nuclear security risk assessment or designing and evaluation of physical protection systems.

Knowledge networks for nuclear security at a national level could also support effective knowledge management in a State. Related to the need for knowledge management discussed in Section 4.5, knowledge networks based on specified types of responsibility in a national nuclear security system are ideal units for effective knowledge sharing among people with common roles on good practices in their roles, thus encouraging continuous improvement of their performance. National knowledge networks are also useful channels for the implementation of national nuclear security capacity building programmes. National capacity building programmes for nuclear security, such as through Nuclear Security Support Centres (NSSCs), need the involvement of all stakeholders, including regulatory bodies, nuclear operators, technical support organizations (TSOs), law enforcement
agencies and organizations responsible for response to nuclear security events. The cooperation and coordination of these stakeholders are critical for the optimization of the programmes to be effective to meet national needs of nuclear security capacity building. National knowledge networks for nuclear security should be a basis for such cooperation and coordination.

At an international level, knowledge networks are expected to facilitate instructive cooperation and share lessons learned and to serve as possible channels for international coordination. Knowledge networks can be established among several 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.

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. It serves as a network in which the participating States collaborate on the development of peer-reviewed textbooks, computer based teaching tools and other instructional materials, mutual faculty exchanges and/or joint development and implementation of in-depth nuclear security training programmes, and joint research and development activities to share scientific knowledge and infrastructure.

The international network for NSSCs is another example of a knowledge network in the area of nuclear security capacity building efforts. The network for NSSCs, also known as centres of excellence, is designed to facilitate the efforts of participating States to improve their capabilities of capacity building activities. The network also provides opportunities for NSSCs to promote a high level of nuclear security training and support services as a cornerstone in the development of sustainable national, regional and global nuclear security training and support centres. In addition, the NSSC network facilitates cooperation and assistance activities (including technical and scientific), as well as optimizes the use of available resources to meet specific needs. To this end, this NSSC network serves as the platform to standardize the quality of nuclear security training in the way that the IAEA provides support for the development of training curriculum and material under this framework.

4 NATIONAL LEVEL AND ORGANIZATIONAL LEVEL CAPACITIES

In discharging the duties required for the fulfilment of nuclear security objectives, the State should endeavour to strengthen its capacity at national and organizational levels.
4.1 NATIONAL LEVEL

As described in Section 4.3, awareness is the foundational state of knowledge on nuclear security and its attainment is crucial in ensuring the achievement of the objective of a State’s nuclear security regime. Hence, the first capacity need for nuclear security is national level awareness of all stakeholders on relevant issues of nuclear security. At the State level the necessary capacities needed to implement an effective nuclear security regime can be described under several overarching categories:

— General knowledge;
— Legislation;
— Coordination;
— International cooperation;
— Leadership; and
— Threat assessment and risk analysis.

General knowledge of nuclear security includes the ability and expertise to recognize security threats and consequences of theft, sabotage, unauthorized access and illegal transfer or other malicious acts involving nuclear material and other radioactive material and their associated facilities and associated activities. It also includes basic understanding of information security and the need to protect sensitive information.

Legislation-related capacity includes the expertise, skills, and knowledge necessary to develop, review, assess, and revise the laws and responsibilities delegated to competent authorities to ensure that nuclear security means that the stakeholders are familiar with the legal framework of the national nuclear security regime.

Coordination involves recognition of the responsibilities for nuclear security of each competent authority through the legal framework. The development of capacity for coordination will ensure that there are appropriate mechanisms in place to facilitate coordination and communication for nuclear security. Planning and policy development may also require coordination across multiple organizations and with decision makers at the national level.

At the national level, capacity for international cooperation provides a global outlook for the national stakeholders. Such awareness includes familiarity with international obligations and the global nuclear security framework, as well as the recognition of the need to establish the required national legal framework. Furthermore, the stakeholders should be aware of national policy for soliciting 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 other potential supporting countries.

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.

Threat and risk assessment capabilities and competences include the expertise and technical knowledge that allow for identification of strategic locations and the performance of a national threat assessment for nuclear security. Capacity to perform threat and risk assessments support design of effective security systems and measures and promote a risk-informed approach. These processes involve the participation of multiple competent authorities and specific expertise. To support nuclear security systems and measures, the State should have the competence to establish procedures for reliable and timely exchange, in accordance with its national information security policies and regulations, and international obligations.

4.2 ORGANIZATIONAL LEVEL

General knowledge for nuclear security is understood to include the necessary knowledge on threats and consequences of theft, sabotage, unauthorized access and illegal transfer or other malicious acts involving nuclear material and other radioactive material and their associated facilities and associated activities.

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

- General knowledge;
- Legislation;
- Regulatory control;
- Information security;
- Coordination;
- Technical measures;
- International cooperation; and
- Threat assessment and risk analysis.
General knowledge for nuclear security at the organizational level includes a basic understanding of nuclear security topics and the related security responsibilities within a specific organization. Organizations should also demonstrate their capacity to establish an effective nuclear security culture.

Legislation-related capacity includes an acknowledgement of the relevant legislative authorities and responsibilities at the organizational level. Legislation-related capacity is also necessary to support the relevant competent authorities in executing their mandated missions, including prosecuting persons engaged in criminal offences associated with nuclear security events. This includes the capacity for the prosecution of offences related to the illicit trafficking of nuclear and other radioactive material.

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. In this regard, the State’s competent authorities should develop and issue information security policy and instructions specific to nuclear and other radioactive material and associated facilities and associated activities. Accordingly, the 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 its sensitive information in compliance with the national security policy. The organization should have the capacity to enforce these measures for the protection of sensitive information. Furthermore, its employees should recognize the need for the security rules and follow the established information security management programme.

Capacity in threat assessment and risk analysis are necessary for the organization to evaluate the threat to its nuclear material, other radioactive material, associated facilities or associated activities, so that the required nuclear security measures can be established. The State’s competent authority should 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 the operator, shipper and carrier. Relevant organizations within the State should have the capacity to assess nuclear security threats, using credible information sources, which specify the motivation, intentions and capabilities of these threats. The organization may also need the capacity to gather and analyse nuclear security threats and provide recommendations for the improvement of nuclear security measures. In this area, intelligence organizations need to possess capacity to include threat information into the design, development and implementation of specific nuclear security plans. The competent authorities need to ensure that authorized persons are able to develop their capacity for effectively detecting and neutralizing adversaries before the completion of malicious acts. Authorized persons should also possess the capacity for maintaining records on nuclear security systems and measures and nuclear security events at facilities.
Coordination at the organizational level involves capabilities 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. 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. Relevant organizations should develop security systems and measures, as well as response plans, coordinating with other organizations or stakeholders, as appropriate. These organizations should be able to mobilize resources rapidly and effectively in response to a nuclear security event. During 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.

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.

Competent authorities need capacity to ensure appropriate regulatory control of nuclear and other radioactive material in the State. This includes the capacity for establishing the appropriate and enforcing the 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 the mechanism 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 effective design, development, implementation and communication for the development of a nuclear security plan.

Technical capacity focuses on technical capabilities relating to nuclear detection, response, and forensics. Technical capacity for human resource development includes operating and maintaining relevant nuclear security equipment, such as radiation detection equipment, to detect material outside regulatory control and physical and protection equipment to protect the facility from unauthorized removal of nuclear and other radioactive materials. Such capacity is also needed to determine and
maintain the preventive and physical protection measures to secure radioactive and nuclear materials during transport, for example, through the introduction of specific packages or conveyances to transport radioactive and nuclear materials including relevant communication systems. The capacity to effectively determine, inspect and maintain such preventive and protective equipment is necessary to ensure sufficient protection and regulatory compliance at relevant facilities for the ultimate purpose of protecting personnel and public from radiation exposure.

In addressing material that could potentially go outside regulatory control, capacity for providing advice for relevant organizations with regard to detection analysis and radiation protection is crucial to support effective decision making during a nuclear security event. This also requires capacity at the organization level for providing testing and calibration services of radiation detection equipment.

Technical capacity is also needed to support appropriate detection and response mechanisms, with assessment of specific data and information. Some organizations will need to leverage or develop expertise in scientific fields to support adjudication of detection alarms (or information alerts) and nuclear forensics capabilities to support criminal investigation.

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 to promote information exchange and build networks among relevant parties. Organizations should have the capacity to identify and select international cooperation programmes that are necessary to support the overall nuclear security implementation in the State.

5 CAPACITY BUILDING METHODOLOGY

Building capacity for nuclear security should be undertaken via a systematic approach that includes provisions for assessing, planning, implementation, documentation, evaluation, and feedback.

This approach should be developed as part of a State’s national security policy and implementation strategy. Prior to the initiation, the government should decide which organizations should coordinate this approach at the national level. Furthermore, each organization with responsibilities should assign a unit to perform the needed work.

5.1 ASSESSMENT AND STRATEGIC PLANNING PROCESS

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 primarily addressing the four fundamental questions:
— What capacity is needed?
— What is already available to meet the needs?
— What is missing or needs to be improved in order to meet the needs?
— What actions are needed?

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: governmental and organizational. The self-assessment method should address the capacity building elements as described in Section 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.

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

1. The organization assigned with the task of coordinating the national capacity building programme should organize a meeting with all relevant stakeholders where the scope of the self-assessment is discussed and agreed.
2. The stakeholders should complete their self-assessments to determine what capacities must be developed and the actions should be taken and return the results to the assigned organization within an agreed time frame.
3. The assigned organization should hold a follow-up meeting where each stakeholder will present a summary of its findings and preliminary action plan of capacity building.
4. The assigned organization should generate a draft report which contains the action plans of capacity building in nuclear security and circulate it to the stakeholders for review and comment. On the basis of comments received, the final report can be prepared as the reference for capacity building action plan.

Action plans may be at the organizational level or the national level. Regardless, all stakeholders should have ownership of their action plans to ensure that they have the resources to complete the plans on the agreed schedule. Furthermore, in developing the capacity building action plan, it is necessary for the State to assign priorities based on the risks and perceived threats to the nuclear security regime and the availability of local resources, both financial and human.

2 The assessment of competence at individual level for each function and respective organization is not covered in this document and may be addressed in a future technical guidance document.
The table provided in Annex I could be used to determine what capacities need to be developed and what capacity building methods could be used. The table provided in Annex II could be used to determine what actions should be taken by respective organizations to develop the capacities. It should be noted that the tables in the appendices are illustrative only and are therefore not exhaustive. As such, they should be used only as a general template.

5.2 DOCUMENTATION, IMPLEMENTATION, AND PROGRESS MONITORING

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

— A summary of the integrated analysis conducted by the government and organizations;
— A short description of the process and meetings that have taken place to conduct the self-assessment;
— Conclusions on the status of each element of the capacity building programme, including any actions identified for improvement;
— Action plans with the agreed completion time;
— Performance indicators or criteria for the success of each action plan;
— List of contributors to the report, including their positions and organizations that they represent;
— References to any relevant materials used for conduction the self-assessment; and
— Confidentiality requirements, if necessary.

The government should coordinate with relevant organizations to establish nuclear security capacity building objectives, develop implementation requirements and approaches, and allocate resources according to their specific needs and priorities. The assigned organization should track the overall progress of capacity building programme and provide the status of each activity. Some organizations may be responsible for the development of multiple capacity building elements related to nuclear security. The assigned organizations may coordinate 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 various institutions and organizations at the national-level.

States may consolidate the capacity building action plan and request 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, where all assistance and support from other organizations and donors can be coordinated, thus optimizing the use of resources and avoiding duplication.

5.3 EVALUATION

Evaluation is the process of determining the value of a programme, course, or other initiative, in order to continuously evolve and improve the efficacy of that initiative. Within a nuclear security regime, evaluation can be used to measure the efficacy of a capacity building programme, as well as identify corrective actions to enhance the national-level or organizational level capacity. This process ensures that a state’s strategic objectives are fulfilled and that capacity building efforts are continually reviewed in order to avoid degradation of the capacities, which could otherwise provide opportunities for adversaries to exploit gaps or nuclear security systems and measures to fail. Well-planned and executed evaluations serve three primary objectives:

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

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:

— Programme evaluation sheets;
— Face-to-face interviews;
— Participant comments throughout the training;
— Individual pre- and post-training tests for comparisons;
— Assessment of action-based learning, such as work-based projects and role plays;
— Observations and feedback by peers, managers, and instructors;
— Focus groups to gather information and share knowledge;
— Participant and trainer surveys;
— Statistical software for job and system performance measures;
Existing evaluation programmes; and

Red teaming (i.e., a mock adversary for exercises).

This list, while not exhaustive, provides a good starting point for the types of tools available for an evaluation. Evaluators are advised to retain the use of their chosen initial tools to promote more consistent comparisons over time—subsequently supplementing them with additional forms of evaluation.

5.4 INTERFACES WITH NUCLEAR SAFETY

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].

When building the capacity for nuclear security, there will be direct interfaces with nuclear safety. In addition, there will also be interfaces with aspects of nuclear safeguards such as nuclear material accounting and control. In practical terms, this means that there are likely to be many areas where building the capacity of regulator and facility staff can follow a common approach. In some cases, the basic competence may be the same (e.g. using equipment for detection, identification, and control 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.

A major interface where capacity building may overlap is in emergency management. Safety and security will both play major roles in addressing nuclear or radiological emergencies arising from nuclear security events, as will accounting for all the nuclear material. Although each type of incident is different in the preparation and response, the response arrangements need to have the capacity to work together seamlessly for the protection of the public and the environment.

In developing the capacity for nuclear security, some States may have existing competencies 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 with analytical capabilities for analysis of nuclear materials. In this regard, the member States may utilize the existing resources to build the capacity for nuclear security.

As mentioned elsewhere in this publication, the capacity to implement a nuclear security regime rests largely in a country’s laws and regulations, the organizations, and people that make it happen. Consequently, these also affect, either directly or indirectly, the implementation of safety and material
accountancy 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 the 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.

As another example, a nuclear facility operator must implement all aspects of safety, security, and nuclear material accountancy. 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 of course the individual mandates for each element). For example, there is existing guidance for developing a nuclear security culture [8] as well as well-established guidance on safety culture [13], and the implementation of these principles shares many common features that should be considered when applying them to a State’s organizations and facilities.
REFERENCES


### 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

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
</table>
| **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  
- Share best practices and case study information in developing legislation for nuclear security  
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  
Awareness: Seminars, briefings, and conferences that provide information about the essential elements of nuclear security  
Training: Workshops or practical training that focus on establishing competent authorities and assigning nuclear security responsibilities | Policy makers |
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<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
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<tbody>
<tr>
<td>Knowledge</td>
<td>Awareness: Briefings, seminars, and messaging that promote a strong nuclear security culture and reinforce the State’s responsibility for securing nuclear and other radioactive materials</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td></td>
<td>Education: Curriculum and degree programmes that address physics, nuclear power subjects, radiation health physics, and other topics to develop expertise relevant to regulating nuclear and radioactive materials.</td>
<td>Competent authorities</td>
</tr>
<tr>
<td>Legislation</td>
<td>Awareness: Briefings, seminars, and messaging that provide information about nuclear security roles and responsibilities, as defined by the State.</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td></td>
<td>Training: Practical or on-the-job training that provides information on legislation related to the security of nuclear and radioactive materials.</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td>International Cooperation</td>
<td>Training: Practical or on-the-job training that provide information on international standards, agreements, and obligations regarding the security of nuclear and radioactive materials.</td>
<td>Regulatory body</td>
</tr>
<tr>
<td>Coordination</td>
<td>Training: Practical or on-the-job training that details the coordination mechanisms across competent authorities and other organizations</td>
<td>Competent authorities</td>
</tr>
<tr>
<td></td>
<td>Training: Workshops, practical, or collective training that provide information about organizations with nuclear security responsibilities</td>
<td>Competent authorities</td>
</tr>
<tr>
<td>Regulatory Control</td>
<td>Knowledge Networks: Share best practices and case study information in developing regulations related to nuclear security</td>
<td>Regulatory body</td>
</tr>
</tbody>
</table>
### 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 licenses.
- Regulatory body

### Knowledge management
- Appropriate inspection methods and techniques are preserved in 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 and other radioactive material**

<table>
<thead>
<tr>
<th>Capacities</th>
<th>National Level</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation</td>
<td>Awareness: seminar that raises awareness on legal framework on international transport of nuclear material and other radioactive material</td>
<td>Policy makers</td>
</tr>
<tr>
<td>International Cooperation</td>
<td>Awareness: regional seminar on international cooperation for the security in the transport of nuclear material and other radioactive material</td>
<td>Policy makers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capacities</th>
<th>ORGANIZATIONAL LEVEL</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Control</td>
<td>Training: workshops that provide knowledge of security requirements for the transport of nuclear material and other radioactive material</td>
<td>Relevant organizations</td>
</tr>
<tr>
<td>Coordination</td>
<td>Training: table top exercise in coordination and cooperation during response to nuclear security event in the international transport of nuclear material and other radioactive material</td>
<td>Competent authorities</td>
</tr>
</tbody>
</table>
### Essential Element 5: Offences and penalties including criminalization

#### NATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation</td>
<td>Awareness: Seminar that raises awareness on prohibition and criminalization of malicious acts against nuclear security regime.</td>
<td>Policy makers</td>
</tr>
<tr>
<td></td>
<td>Awareness: Meeting to enhance State's commitment to international obligations in nuclear security</td>
<td>Policy makers</td>
</tr>
</tbody>
</table>

#### ORGANIZATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legislation</td>
<td>Training: Course that enables the participants to define offences or violations under domestic laws or regulations those criminal or intentional authorized acts involving or directed at nuclear material, other radioactive material, associated facilities or associated activities</td>
<td>Competent authorities</td>
</tr>
<tr>
<td>Regulatory Control</td>
<td>Training: A course that enables participants to develop risk-based regulation on nuclear security</td>
<td>Regulatory body</td>
</tr>
</tbody>
</table>

### Essential Element 6: International cooperation and assistance (3.6)

#### NATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Cooperation</td>
<td>Awareness: Workshop that enable policy makers to develop integrated nuclear security support plan (INSSP)</td>
<td>Policy makers</td>
</tr>
<tr>
<td></td>
<td>Awareness: To receive Integrated Nuclear Security Advisory Service (INSServ) Mission to help the State to review the general status of measures that protect against nuclear terrorism and identify ways to improve a broad spectrum of nuclear security activities</td>
<td>Policy makers</td>
</tr>
</tbody>
</table>
### ORGANIZATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Cooperation</td>
<td>Knowledge network: To participate in knowledge network to share experience and best practices in prosecution of malicious acts against nuclear material, other radioactive material, associated facilities or associated activities</td>
<td>Competent authorities</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination</td>
<td>Awareness: Programmes and mechanisms to facilitate awareness of the multiple stakeholders and data required to generate threat, vulnerability, and consequence assessments for risk analysis</td>
<td>Policy makers</td>
</tr>
<tr>
<td>Threat assessment and risk analysis</td>
<td>Awareness: Programmes and seminars to impart information about that the results of the national threat assessment, including development of design basis threat (DBT), 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.</td>
<td>Policy makers</td>
</tr>
<tr>
<td></td>
<td>Awareness: High level meeting to provide knowledge on possible threats, including insider threat, on the security of nuclear materials, other radioactive materials, associated facilities and associated activities, and to develop national design basis threat.</td>
<td>Policy makers</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>ORGANIZATIONAL LEVEL</th>
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<tbody>
<tr>
<td><strong>Capacities</strong></td>
</tr>
<tr>
<td>Information Security</td>
</tr>
<tr>
<td>Threat assessment and risk analysis</td>
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<td>Technical measures</td>
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<tr>
<td>Essential Element 10: Detection of nuclear security events</td>
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### NATIONAL LEVEL

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<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
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</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>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.</td>
<td>Policy makers</td>
</tr>
<tr>
<td>Coordination</td>
<td></td>
<td></td>
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<tr>
<td>International Cooperation</td>
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</tr>
</tbody>
</table>

### ORGANIZATIONAL LEVEL

<table>
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<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination</td>
<td>Awareness: Seminars, briefings, and informational materials related to nuclear detection operations, technologies, protocols, and communication mechanisms available to all individuals with security responsibilities.</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td>Technical measures</td>
<td>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.</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td></td>
<td>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 needed tasks.</td>
<td>Competent authorities and authorized persons</td>
</tr>
</tbody>
</table>
### Training
- Practical training on how to operate nuclear detection equipment, including the appropriate concept of operations for the application of nuclear security.

### Frontline organizations
- 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.

## Essential Element 11: Planning for, preparedness for and response to a nuclear security event

### NATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>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.</td>
<td>Policy makers</td>
</tr>
<tr>
<td>Coordination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Cooperation</td>
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### ORGANIZATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination</td>
<td>Awareness: Workshops and seminars on roles and responsibilities for response to nuclear security events.</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td><strong>Legislation</strong></td>
<td>Awareness: Workshops and seminars to provide information about relevant laws and regulations pertaining to collection and handling of evidence within a nuclear security event</td>
<td>Competent authorities</td>
</tr>
<tr>
<td>----------------</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Technical measures</strong></th>
<th>Awareness: Workshops and seminars providing information about the responsible organizations, procedures, and protocols for assessing nuclear security alarms and alerts.</th>
<th>Competent authorities and authorized persons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Training: Practical, on-the-job, and collective training on procedures and protocols related to response to nuclear security events</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td></td>
<td>Awareness: Workshops and seminars to provide an overview of nuclear forensics and the necessary expertise to support technical nuclear forensics capabilities</td>
<td>Technical support organization</td>
</tr>
<tr>
<td></td>
<td>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 needed tasks</td>
<td>Frontline organizations</td>
</tr>
<tr>
<td></td>
<td>Education: Utilize and provide input for curriculum development, scholarships, fellowships, and educational certification programmes foster and promote development of technical expertise in nuclear forensics and detection related fields</td>
<td>Competent authorities and authorized persons</td>
</tr>
</tbody>
</table>
## Essential Element 12: Sustaining a nuclear security regime

### NATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership</strong></td>
<td>Awareness: Conference, seminars, and briefings to promote national commitment to nuclear security at the highest levels and support a strong nuclear security culture at all levels: nationally, regionally, and internationally</td>
<td>Policy makers</td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>International</strong></td>
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</tbody>
</table>

### ORGANIZATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacities</th>
<th>Capacity Building Elements and Methods</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coordination</strong></td>
<td>Training: Workshops or training activities focused on engagement across national, regional and international programmes to focus on best practices and methods for build, maintaining and continuously improving the human resources for nuclear security regime</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td><strong>Technical measures</strong></td>
<td>Workforce management: Workforce Management: Dedicated resources and management for workforce planning necessary to staff nuclear security roles within the organization</td>
<td>Competent authorities and authorized persons</td>
</tr>
<tr>
<td></td>
<td>Training: Specific training on maintenance and calibration of nuclear security equipment.</td>
<td>Technical support organization</td>
</tr>
<tr>
<td><strong>International</strong></td>
<td>Training: Workshops or training activities focused on engagement across national, regional and international programmes to focus on best practices and methods for build, maintaining and continuously improving the human resources for nuclear security regime</td>
<td>Competent authorities and authorized persons</td>
</tr>
</tbody>
</table>
# ANNEX II: NATIONAL AND ORGANIZATIONAL CONDITIONS FOR CAPACITY BUILDING

## NATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacity Building Element</th>
<th>Capacity</th>
<th>Conditions Needed</th>
<th>Suggested Plan For Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Knowledge</td>
<td>• Institutions for higher education are available to support development of the needed nuclear security expertise</td>
<td>• Review the status of higher education system and discuss the need for specific curriculum on nuclear security</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Nuclear security is included as a part of higher education curriculum in the country, as appropriate</td>
<td>• Identify a list of technical expertise and competences required for graduates of nuclear security education programme</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The needs for specific education programmes for nuclear security are identified and correctly addressed</td>
<td>• Prepare education curriculum for nuclear security and share with all relevant organizations for feedbacks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The possibility of international education of nuclear security is identified and its relevance to the national capacity building programme is evaluated</td>
<td>• Evaluate the needs to participate in international education on nuclear security and arrange for relevant funding.</td>
</tr>
<tr>
<td>Training</td>
<td>Technical measures</td>
<td>• National training institutions are available to provide and leverage for a centralized training programme for nuclear security</td>
<td>• Develop a plan to strengthen the existing institutions or to establish a new institutions, as necessary, to anticipate the demand for trained nuclear security personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A plan is developed to strengthen existing institutions or to establish new institutions, as needed</td>
<td></td>
</tr>
<tr>
<td>Capacity Building Element</td>
<td>Capacity</td>
<td>Conditions Needed</td>
<td>Suggested Plan For Action</td>
</tr>
<tr>
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<td>-------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td>A national training curricula is available in the relevant organizations to support the national nuclear security regime</td>
<td></td>
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<tr>
<td></td>
<td>The training curricula are developed to support the roles and responsibilities of the organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The training curricula take into account the interfaces with other organizations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Propose standardized training curricula that meet the needs for competent staff in the relevant organizations</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Evaluate the existing and implemented training curricula on nuclear security and review whether the interface with relevant organizations have been addressed properly</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Awareness</strong></td>
<td>A governmental organization is assigned to coordinate and implement national capacity building activities. This should include assigning clear roles and responsibilities</td>
<td></td>
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<tr>
<td></td>
<td>Needs assessment at 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</td>
<td></td>
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<tr>
<td></td>
<td>A coordinating mechanism is established to enable the relevant organizations to</td>
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</tr>
<tr>
<td><strong>Coordination</strong></td>
<td>Responsible security agency/authority should prepare administrative arrangement to coordinate in building capacity for nuclear security</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Legislation</strong></td>
<td>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 TSOs)</td>
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<td></td>
<td>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</td>
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</table>
## NATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacity Building Element</th>
<th>Capacity</th>
<th>Conditions Needed</th>
<th>Suggested Plan For Action</th>
</tr>
</thead>
</table>
| **Knowledge**             |          | • Programmes exist that promote awareness of nuclear security issues among the appropriate levels, governmental, organizational, individual, and the general public  
• This includes awareness on threats and consequences of theft, sabotage, unauthorized access and illegal transfer or other malicious acts involving nuclear material and other radioactive material 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**            |          | • Recognise the need to establish national nuclear security capacities  
• The capacity building programme has a 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 nuclear security | • Request budget proposal for capacity building activities to the relevant national financial authorities. Authority |

Communicate their needs to the Government

Nuclear security
<table>
<thead>
<tr>
<th>Capacity Building Element</th>
<th>Capacity</th>
<th>Conditions Needed</th>
<th>Suggested Plan For Action</th>
</tr>
</thead>
</table>
| International cooperation |          | • A governmental policy is in place to enable the national organizations to co-operate with relevant international organizations/networks/stakeholders  
• The needs assessment for capacity building takes into consideration international cooperation  
• IAEA’s Integrated nuclear security support plan is established and updated regularly  | • Establish a governmental policy and guidance that enables the relevant organizations to co-operate 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 national level |
| 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 coordinating agency  
• Develop guidance on how to perform job requirements analysis and identify the required competencies for nuclear security  
• Perform job requirement analysis and identify the needed competencies, and submit the result to the coordinating agency |
<table>
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<tr>
<th>Capacity Building Element</th>
<th>Capacity</th>
<th>Conditions Needed</th>
<th>Suggested Plan For Action</th>
</tr>
</thead>
</table>
| Coordination              |          | • Appropriate workforce management is available for attracting, training and retaining adequate number of competent human resources for the needs of all governmental agencies involved in the implementation of nuclear security regime  
• Adequate resources are available for the implementation of the national programme for workforce management | • Evaluate ad identify the needs for additional resources to implement workforce management programme and prepare relevant funding for implementation |
| Knowledge management      | Knowledge| • Knowledge management system is established among relevant governmental organizations to identify, store and disseminate knowledge generated during the implementation of nuclear security regime  
• Proper nuclear security terminology is established in order to have common understanding among the relevant organizations in implementing nuclear | • Identify best practices programme as essential tools for knowledge management and develop a national level  
• Identify knowledge management values (leadership, knowledge sharing environment, and culture) and undertake measures to preserve them  
• Promote the establishment of community of practice in nuclear security to create |
### NATIONAL LEVEL

<table>
<thead>
<tr>
<th>Capacity Building Element</th>
<th>Capacity</th>
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<th>Suggested Plan For Action</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>security regime</td>
<td>pool of experts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Community of practice in nuclear security is established</td>
<td></td>
</tr>
<tr>
<td>Knowledge networks</td>
<td>Knowledge</td>
<td>• National capacity building centre, e.g. in the form of Nuclear Security Support Centre (NSSC), is established for supporting the implementation of nuclear security regime</td>
<td>• Establish national capacity building centres to support the implementation of nuclear security regime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The relevant technical and scientific support organizations (TSOs) are identified and involved in implementing nuclear security regime</td>
<td>• Identify training needs and targeted audiences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Exchange and sharing of knowledge, experience and good practices are conducted via knowledge networks</td>
<td>• Identify and invite the relevant TSOs to support the implementation of nuclear security regime</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Leverage existing capacity building infrastructure to support knowledge network activities</td>
</tr>
<tr>
<td>International Cooperation</td>
<td>The Government and any other relevant organizations in the Member State participate in the knowledge networks of nuclear security (e.g. NSSC and INSEN) to support capacity building programme</td>
<td>• Promote the participation of the government and relevant organization to participate in various knowledge network on nuclear security, including the IAEA’s Nuclear Security Support Centre (NSSC) and International Nuclear Security Education Networks (INSEN)</td>
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<td>• Devise mechanism to disseminate</td>
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### NATIONAL LEVEL

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</table>

- discussion in NSSC and INSEN to enhance national capacity building programme
  - Develop and maintain e-learning website to promote capacity building in nuclear security

### ORGANIZATIONAL LEVEL

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</tr>
</thead>
</table>
| 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  
• Capacity building aspects for nuclear security are addressed in organizational long-term plans | • Establish a capacity building programme for nuclear security, approved by the management  
• 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  
• The relevant units are involved in the process of determining the needs | • Coordinate and implement capacity building activities for nuclear security and engage all units of the organization  
• Prepare the budget for capacity building programme, taking into account the feedback from relevant units of the organization |
<table>
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<tr>
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<th>Suggested Plan For Action</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>related to the capacity building programme for nuclear security</td>
<td>organization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The proper channels to communicate to the relevant Governmental organizations is established</td>
<td>• Establish a strong liaison for the coordinating agency and regularly participates its meetings in capacity building programme</td>
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<td></td>
<td>• Evaluate the effectiveness of the capacity building programme based on the pre-defined performance indicator</td>
</tr>
<tr>
<td>International cooperation</td>
<td></td>
<td>• The need for international cooperation in capacity building is included in the needs assessment</td>
<td>• Evaluate the need for international cooperation programme for capacity building, taking into account the feedbacks from the relevant units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Organizational action plans for international cooperation has been established</td>
<td>• Develop actions plan for capacity building in nuclear security</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The capacity building programme is supported by appropriate international cooperation framework.</td>
<td>• Develop the required legal framework for a cooperation arrangement with international counterparts, with the approval of Ministry of Foreign Affairs</td>
</tr>
<tr>
<td>Education</td>
<td>Knowledge</td>
<td>• Access to higher education to obtain properly qualified individuals for nuclear security is available</td>
<td>• Perform assessment on the need for a university level professional development education course on nuclear security</td>
</tr>
<tr>
<td>Training</td>
<td>Technical measures</td>
<td>• The organization establishes a training programme to fulfil the needs for competent staff to support nuclear</td>
<td>• Management to provide support for the development of training facilities as necessary if national facilities do not exist.</td>
</tr>
<tr>
<td>Capacity Building Element</td>
<td>Capacity</td>
<td>Conditions Needed</td>
<td>Suggested Plan For Action</td>
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<tr>
<td>ORGANIZATIONAL LEVEL</td>
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<tr>
<td></td>
<td>security</td>
<td>• The organization possess its own training facilities to support its capacity building activities as needed</td>
<td>• Identify necessary national expertise and equipment for training</td>
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<td></td>
<td></td>
<td>• The organization develops qualified in-house trainers to support its roles and responsibilities in nuclear security</td>
<td>• Acquire external trainers as necessary or sending staff to external training</td>
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<td></td>
<td></td>
<td>• The organization develops tailored-training curricula to support the training programme</td>
<td>• Identify and promote the development of necessary national expertise for training</td>
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<td></td>
<td>• The organization has formal arrangements with other national educational and training institutions to address relevant needs and support</td>
<td>• Set up training programmes based on the Systematic Approach to Training advocated by the IAEA</td>
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<td></td>
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<td>• A field exercise is performed whenever relevant as a part of the training programme</td>
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<tr>
<td>Awareness</td>
<td>Leadership</td>
<td>• The organization establishes an awareness programme for relevant individuals that do not have direct roles and responsibilities in nuclear security</td>
<td>• Management to make sure that awareness building for its staff is part of its overall operations strategy</td>
</tr>
<tr>
<td>Workforce management</td>
<td>Leadership</td>
<td>• The organization develops recruitment procedure to ensure the qualifications and capabilities of its personnel</td>
<td>• Organizations must have one or more persons responsible for workforce management to make sure that the</td>
</tr>
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<td>Capacity Building Element</td>
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<td>appropriate staff are hired and maintained</td>
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<tr>
<td>Coordination</td>
<td></td>
<td>• The organization performs a human resource needs assessment based on the established national nuclear security regimes in the country</td>
<td>• Obtain qualified experts in performing an objective needs assessment</td>
</tr>
<tr>
<td>International Coordination</td>
<td></td>
<td>• The organization uses the IAEA and other relevant tools to assess the staff’s competence and training needs</td>
<td>• Contact the relevant IAEA staff</td>
</tr>
</tbody>
</table>
| 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 (i.e. Technical Cooperation Programme) |
| Knowledge networks         | International coordination | • The organization participates in national, regional or international knowledge networks, to support its capacity building activities | • Utilize IAEA and other international resources |