Hungarian Atomic Energy Authority

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Security Culture

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FOREWORD FROM THE DIRECTOR GENERAL

The Hungarian Atomic Energy Authority (hereinafter referred to as HAEA) is a central state administration organ (a so-called government office) having nation-wide competence in the field of peaceful use of atomic energy; it operates under the direction of the Government, it has independent tasks and scope of authority. The HAEA was established in 1990 by the Government of the Republic of Hungary with Govt. decree 104/1990. (XII. 15.) Korm. on the scope of tasks and competence of the Hungarian Atomic Energy Commission and the OAH.

The public service of the HAEA as defined in law is to perform and coordinate, independently of organizations having interest in the application of atomic energy, the regulatory tasks in relation to the peaceful and safe use of atomic energy, including the safety of nuclear facilities and materials, nuclear emergency response and nuclear security, and the corresponding public information activity, and to make proposal to develop and amend, and to offer an opinion on proposed legislations corresponding to the use of atomic energy.

The fundamental nuclear safety objective is to ensure the protection of individuals and groups of the population and of the environment against the hazards of ionising radiation. This is ensured with effective safety measures implemented and adequately maintained in the nuclear facility.

The radiation protection objective is to keep the radiation exposure of the operating personnel and the public all times below the prescribed limits and as low as reasonable achievable. This shall be ensured in the case of radiation exposures occurring during design basis accidents, and as far as reasonably possible during beyond design basis accidents and severe accidents.

The technical safety objective is to prevent or avoid the occurrence of accidents with high confidence, and the potential consequences occurring in the case of every postulated initiating event taken into account in the design of the nuclear facility shall remain within acceptable extent, and the probability of severe accidents shall be adequately low.

The HAEA determines the way how the regulations should be implemented in guidelines containing clear, unambiguous recommendations in agreement with the users of atomic energy. These guidelines are published and accessible to every members of the public. The guidelines regarding the implementation of nuclear safety, security and non-proliferation requirements for the use of atomic energy are published by the director general of the HAEA.

FOREWORD

The internationally accepted bases of physical protection are represented by the Law Order 8 of 1987 on the promulgation of the International Convention on the Physical Protection of Nuclear Materials, the Act LXII of 2008 on the promulgation of the Amendment to the Convention on Physical Protection of Nuclear Materials approved in the frame of the International Atomic Energy Agency and promulgated by Law-decree 8 of 1987 amended by a Diplomatic Conference organized by the IAEA signed on July 8, 2005, and the Act XX of 2007 on the promulgation of the International Convention for the Suppression of Acts of Nuclear Terrorism.

The realization of the stipulations undertaken by Hungary, at the highest level, is represented by the Act CXVI of 1996 (hereinafter referred to as Atomic Act), which includes the fundamental security principles and establishes the frame of the detailed physical protection regulations.

The Govt. decree 190/2011. (IX. 19.) Korm. published based on the authorization of the Act (hereinafter referred to as Government Decree) establishes the legal requirements for the physical protection of the use of atomic energy and for the connecting licensing, reporting and inspection system.

The HAEA is authorized to develop recommendations regarding the implementation of requirements established in laws, which are published in the form of guidelines and made accessible on the website of the HAEA.

For the fast and smooth conduct of licensing and inspection procedures connecting to the regulatory oversight activity, the Authority encourages the licensees to take into account the recommendations of the guidelines to the extent possible.

If methods different from those laid down in the regulatory guidelines are applied, then the Authority shall conduct an in-depth examination to determine if the applied method is correct, adequate and full scope, which may entail a longer regulatory procedure, involvement of external experts and extra costs.

The guidelines are revised regularly as specified by the HAEA or out of turn if initiated by a licensee.

The regulations listed are supplemented by the internal regulations of the licensees and other organizations contributing to the use of atomic energy (designers, manufacturers etc.), which shall be developed and maintained according to their quality management systems.
Before applying a given guideline, always make sure whether the newest, effective version is considered. The valid guidelines can be downloaded from the HAEA's website: http://www.oah.hu.

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1 INTRODUCTION

1.1 Scope and objective of the guideline

The guideline contains recommendations on how to comply with the regulations established in the Decree.

It provides detailed guidance regarding the implementation and development of security culture.

1.2 Corresponding laws and regulations

Legal background of nuclear security requirements are provided by the Atomic Act and the Decree and the following provisions:

a) Convention on The Physical Protection of Nuclear Material And Nuclear Facilities as Amended, IAEA, CPPNM/AC/L.1/1, 2005.
b) Nuclear Security Culture, IAEA Nuclear Security Series No. 7, IAEA, 2008.

2 TERMINOLOGY

In addition to the definitions in Section 2 of the Atomic Act and Section 2 of the Decree, this guideline uses the following definitions:

Safety culture: The assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.
Unacceptable radiological consequence: a consequence of sabotage directed against a nuclear facility, nuclear material, a radioactive source or radioactive waste is unacceptable if it cause or might cause nuclear emergency. Furthermore, if the sabotage causes substantial exceedance of the dose limits for individuals or group of individuals in a short period or it is suitable to cause such extra radiation exposure.
Nuclear security: set of such activities, tools and procedures, which are directed to prevent and detect of, response to and manage the consequences of sabotage or a malicious act or unauthorized removal related to nuclear or other radioactive material or a nuclear facility.
Security culture: The assembly of characteristics, attitudes and behavior of individuals, organizations and institutions which serves as a means to support and enhance nuclear security.

3 RECOMMENDATIONS OF THE GUIDELINE

3.1 General considerations

The English term "nuclear security culture", unfortunately, was translated as guarding culture during the ratification of the original Convention on the Physical Protection of Nuclear Material, so Hungary had to use that also during the ratification of the modification of the Convention. However, the„"nuclear security culture" as culture is not limited to guarding, either to physical protection issues, but is/can be interpreted much wider, as the culture of nuclear security. Based on all that, the guidance in this document handles the concept of physical protection culture as part of the nuclear security culture.

In harmony with Principle F of the Amendment of the Convention on Physical Protection of Nuclear Materials (and Nuclear Facilities), Section 15 of the Decree contains the following requirement for security culture:

Section 15

Nuclear security culture

> *The obligant shall develop and maintain security culture necessary to ensure effective implementation of the physical protection system within the entire organization and to ensure that each organization, organizational unit and person manages the physical protection related activities with due importance.*

Nuclear security culture at the appropriate level should ensure that the particular steps meant to implement physical protection receive the attention warranted by their significance. Each organization or organizational unit playing role in the realization of physical protection should ensure due priority to the activities connected with physical protection.

Threats to nuclear facilities, nuclear materials, radioactive sources and radioactive wastes are induced by such adversaries and terrorists, whose aim is to carry out a malicious act (unauthorized removal, sabotage). The threat may come not only from outsiders but insider threats should also be taken into account. Nuclear security culture plays an important role in ensuring that individuals, organizations and institutions remain vigilant and that sustained measures are taken to prevent and combat these threats.

Major players of an effective physical protection, on the application side, are the individuals playing role in physical protection and the technical and administrative tools planned, operated and maintained by them.

A nuclear security regime consists of a range of elements and activities, including: legislation and regulation; assessment of the threat to nuclear and other radioactive material and associated activities and facilities; tools and procedures in the administrative and various technical systems of nuclear security; response capabilities and mitigation activities. An effective nuclear security culture is dependent on proper planning, operation and maintenance of physical protection. In addition, it depends on professionals who plan, operate and maintain nuclear security systems. Even a well designed system can be degraded if the procedures necessary to operate and maintain it are poor, or if the operators fail to follow procedures.

The human factor is generally a contributor to all nuclear security related incidents as well as malfunctions related to activities involving nuclear or other radioactive material. Such incidents and failures may involve unintentional personnel errors as well as ergonomic issues related to the design and layout of software and hardware, inadequate organizational procedures and processes and management failures. Individual understanding of and commitment to roles and responsibilities, commitment to continuous improvement, and management commitment are of great importance to effective nuclear security.

After all, the success of the total physical protection system depends on the individuals contributing to it. So it can be concluded that any effort made in order to increase the level of security culture should focus on human factor.

3.2 Relationship between safety culture and security culture

Both the safety culture and security culture is dependent on individual commitment and undertaking of responsibilities. While both nuclear safety and nuclear security consider the risk of inadvertent human error, nuclear security places additional emphasis on deliberate acts that are intended to cause harm. Because security deals with deliberate acts, security culture requires different attitudes and behavior, such as confidentiality of information and efforts to deter malicious acts, as compared with safety culture. The principal shared objective is to limit the risks resulting from nuclear and other radioactive materials and the concerned facilities. This objective is largely based on common principles, e.g. a

questioning attitude, rigorous and prudent performance of activities, and effective communication and open, two way communication.

Safety and security cultures cooperate in several matters and supplement each other. They need to reinforce each other because they share the common objective of limiting risk. There can be occasions where there are differences between safety and security requirements and would become contradictory in particular issues. In such cases the management should carefully consider the situation, take into account the significance of the relevant safety and security case.

3.3 Roles and responsibilities of institutions, individuals, public and international community

Security culture involves individuals in a number of diverse disciplines and organizations. In order to effectively work together the roles and responsibilities of the involved organizations should be clearly determined.

3.3.1 Role of the State

The responsibility for the establishment, implementation and maintenance of an effective nuclear security regime within a State rests with the State and the organizations. The State has the responsibility for establishing the legal and regulatory framework to foster an effective nuclear security culture.

Role of the State (state organizations):

1. Development of nuclear security policy and requirements based on threat assessment of the State
    a. Identifying the security significance of individual systems;
    b. Specifying threat levels;
    c. Operation standards;
    d. Reporting system;
    e. Design requirements for physical protection systems;
    f. Licensing system for particular activities;
    g. Development of accounting and record keeping system;
2. Development of legal frames
    a. Access order to facilities, control of individual reliability;
    b. Protection of sensitive information;
    c. Development of enforcement system regarding adversaries;
3. Exact distribution and definition of responsibilities between

   a. State organizations
   b. State organizations and users
4. Coordination and exercises between
   a. State organizations
   b. State organizations and users

3.3.2 Role of user organizations

1. Development of nuclear security policy
2. Management system
   a. Roles, responsibilities, accountability
   b. Appointment of an individual responsible for nuclear security
   c. Balancing between contradictory safety and security requirements
3. Provision of (financial, technical, human) resources
4. Management system
   a. Expectations, measure-assess-testing activities, feedback
5. Review and improvement (recognition, analysis and correction of discrepancies).

The nuclear security policy of the organizations should contain a sound management system. This should declare a commitment to quality of performance in all nuclear security activities (including physical protection), making it clear that security has high priority. This policy forms the foundation of the management systems. Relevant elements of the policy should be communicated to and understood by everyone affected.

The management system should define roles, responsibilities and accountability for each level of the organization, including cooperation with physical protection and other interfaces.

An individual responsible for nuclear security should be appointed who has sufficient authority, autonomy and resources to implement and oversee nuclear security activities. This individual should be required to report to the top manager or to an appropriate senior manager of the organization. His/her responsibility should be defined and documented in sufficient detail to prevent ambiguity.

The organization should establish procedures to facilitate effective resolutions regarding the practical balance among nuclear and radiation safety, security and the various facility operations.

The organization should allocate sufficient financial, technical and human resources to implement the assigned security responsibilities. It should ensure that all security personnel have the necessary qualifications, and these qualifications maintained by an appropriate training and development programme. Personnel should also have the necessary equipment, adequate work areas, up to date information.

Management systems should define expectations, implement and maintain processes, measure progress, assess compliance, improve performance on the basis of experience, and manage change.

3.3.3 Role of managers in organizations

1. Establish policy, regulation, procedures
2. Define expectations
3. Encourage individuals
4. Demonstrate example/model behavior

In organizations the implementation of security culture could be mostly facilitated by responsible managers, first of all through their commitment and behavior, but mainly by making aware of

- that credible threat exists, and
- that nuclear security is essential.

3.3.3.1 Responsibility of managers

- ensuring that appropriate standards of behavior and performance associated with security are set,
- ensuring that there is a clear understanding of the security roles and responsibilities of each individual,
- ensuring understanding and compliance with a formal decision making mechanism,
- making aware of and be committed to nuclear security requirements and best practices, ensuring compliance with security technologies,
- maintaining effective communications within the whole organization while considering requirements for the protection of sensitive security information,
- regular nuclear security training and professional development.

3.3.3.2 Motivation

Managers have a key role in ensuring that staff members are appropriately motivated, and that their role in enhancing nuclear security is recognized and valued within the organization.

Rewards and recognition can encourage vigilance, questioning attitudes and personal accountability. Any culture evolves slowly and resists change; therefore, maintaining and improving nuclear security culture requires persistent effort, frequent monitoring and constructive feedback; all these can be maintained in a motivated atmosphere.

3.3.3.3 Continuous improvement

Both the managers and personnel should seek continuous improvement in nuclear security culture. Methods for improvement are as follows:

- analysis of relevant experiences (even from other institutions), taking of appropriate corrective actions,
- conduct of self-assessments and arrange for independent audits to identify and correct weaknesses,
- regular drills and exercises to test the performance of technical systems and human factor,
- periodical review of procedures and monitoring operational practice,
- benchmark performance to national and international best practices;

3.3.4 Role of personnel

1. Awareness
2. Follow requirements

In an effective security culture, all personnel are accountable for their behavior and are motivated to ensure nuclear security.

They should be expected to conduct their security tasks in a prudent manner, accurately observing the requirements and recognizing the circumstances and potential consequences of their behavior.

They should be aware that constant vigilance, a proactive questioning attitude, importance of information protection are expected components of an effective nuclear security culture.

3.3.5 Role of the public

Nuclear security can profit much by raising public and media awareness to security culture in the nuclear field. The persons, organizations and institutions concerned in nuclear security should recognize the important role of public in nuclear security culture.

In this respect public involves all layers of the society, including local community, media, education system, private institutes, which forms organic part of that social environment, in which physical protection operates.

The public should be aware that security is a key consideration for nuclear facility operation. Factual and unambiguous delivery of information is essential requirement in information of and building confidence in the public. Communicating news needs responsible consideration by the operator in order to determine that which physical protection related information might be delivered to the public.

3.3.6 Role of international community

The role of the international community in nuclear security culture arises from the common interest of States in achieving the improved security of radioactive material, nuclear material, nuclear facilities worldwide and their associated transport.

The international community provides guidance and support that can be used by the States when developing their regulatory and institutional infrastructure, including national legislation and practices.

Publications of the International Atomic Energy Agency, UN Security Council resolutions and the respective conventions established under their egis are the most important with regard to the implementation of security culture.

3.4 Characteristics of nuclear safety culture

The next figure describes that the efforts made to reach an effective nuclear security culture are based on the belief that there is a (credible) threat. The behavior of the users is indispensable for these efforts, since it ensures the importance of nuclear security (including physical protection) aspects. The next step is decision making and the principles of respective guidelines. A well established and operated management system, which ensures due consideration of physical protection and the behavior of managers and staff members that fosters the compliance with physical protection requirements are the next steps.

3.4.1 Beliefs and attitudes

Where an effective nuclear security culture exists, people who have responsibilities for the use, handling, safe-keeping or transport of nuclear or other radioactive material and related facilities hold a deep rooted belief that there is a credible insider and outsider threat, and that nuclear security that involves physical protection is important.

These beliefs help to achieve objectives relating to nuclear and radiological non-proliferation and counter-terrorism.

Nuclear security should be a concern of everyone and not only the physical protection organization's security specialists alone.

3.4.2 Principles for guiding decisions and behavior

An effective nuclear security culture requires a set of principles that managers can build up in the organization to guide decisions and behavior. The principles should be explained to staff. These principles should be inculcated in the individuals and evidence should be shown that they are being applied consistently.

3.4.2.1 Commitment and responsibility

Everyone should take personal responsibility for use, storage and transport of materials and operation of facilities.

3.4.2.2 Leadership

The greatest influences on individual performance are the expectations of the leaders. Nuclear security is the most effective when managers and supervisors of the organization continually demonstrate their commitment to security through their words and actions.

3.4.2.3 Motivation

Motivation is entirely dependent upon beliefs and values. Motivation is the key for behavior.

3.4.2.4 Learning and improvement

Nuclear security can be improved by continuous self-assessment, understanding of the reasons why mistakes occur, and application of the best practices and lessons learned.

3.4.2.5 Professionalism and competence

Nuclear security requires that personnel have the qualifications, skills and knowledge needed to perform all aspects of their jobs. Appropriately qualified and trained personnel should be able to respond effectively to all nuclear security related challenges.

3.4.3 Management systems

Staff performance is influenced by the quality of management and the provision of expectations, requirements and standards for the conduct of work, training, documented procedures, information systems, etc. Therefore, a well developed management system is an essential feature of effective nuclear security.

3.4.3.1 Visible security policy

The policy document of the organization (or in a separate security policy) should state the commitment of the organization to nuclear security. The staff members should be aware of expectations that include protecting information, being aware of potential security concerns and threats, and being vigilant in reporting security incidents. These general expectations can be established through a documented code of conduct.

3.4.3.2 Clear roles and responsibilities

Members of the organization need a clear understanding of 'who is responsible for what'. It is particularly important to review and update this responsibility system when organizational change is being executed.

3.4.3.3 Performance measurement

Quantified indicators for the goals set should be used to measure nuclear security performance to evaluate the results against management expectations.

3.4.3.4 Work environment

The physical and psychological work environment has a large impact on how staff members perform their tasks and comply with nuclear security requirements.

3.4.3.5 Training and qualification

A systematic approach to training and qualification is required.

3.4.3.6 Work management

All work should be suitably planned and prepared in order to ensure that nuclear security is not compromised.

3.4.3.7 Information security

Controlling access to sensitive information should be a vital part of the security function. Accordingly, the organization should establish procedures for protecting sensitive information.

3.4.3.8 Operations and maintenance

Nuclear security system equipment requires careful operation, periodic maintenance, and occasional modification and replacement. In all cases, it is necessary to ensure that the intended physical protection of the system is not compromised by maintenance or removal of the system from service, or appropriate compensatory measures should be in place for such cases.

3.4.3.9 Determination of staff trustworthiness

Any security barrier or procedure can be defeated with insider cooperation. Therefore, effective processes for the determination of trustworthiness, especially of persons working in important and confidential jobs, should be in place.

3.4.3.10 Quality assurance

The security function and within that the physical protection matters require the same degree of rigor and control as the operation process. Therefore, standard quality management practices should be applied also in this field.

3.4.3.11 Change management

Many organizational problems and failures may arise from the inadequate management of change. This is true for changes in equipment, procedures, organizational structures, and roles or personnel. Therefore, the organization should have effective processes in place to understand, plan, implement and reinforce change related to nuclear security.

3.4.3.12 Feedback process

An organization that can learn from its own and the experience of others will be able to continuously improve its nuclear security performance. In order for ensuring effective learning (experience feedback) procedures should exist for obtaining, reviewing and applying experience from internal and external sources.

3.4.3.13 Contingency plans and drills

Even if security events are rare, the nuclear security system should be in a continuous state of readiness to handle security events. Set of contingency plans should be developed and drilled to respond to sabotage, unauthorized removal, malicious acts or their attempts.

3.4.3.14 Self-assessment

Self-assessment includes a wide range of assessment programmes, root cause analyses, performance indicators, lessons learned and determination and tracking of corrective actions.

3.4.3.15 Interface with regulator and law enforcement bodies

A constructive working relationship with each regulatory or law enforcement body ensures that information is exchanged regarding important nuclear security matters.

3.4.3.16 Record keeping

Records (of materials, equipment to be protected and the respective authorizations) support the physical protection related planning and control processes.

3.4.4 Behavior

Behavior is an observable action or statement. Individuals are inclined to learn and imitate prevailing patterns of behaviour existing in the group around them. Once established, these patterns can be difficult to alter. The effectiveness of nuclear security and physical protection within that depends on the behavior of all personnel, including vigilance, questioning, executing work accurately and adhering to high standards for individual and collective behaviour.

3.4.4.1 Leadership behavior

Leaders should establish performance expectations for nuclear security to guide staff in carrying out their responsibilities.

Responsibility within the organization should be clearly determined. Responsibilities should be free of contradiction and documented.

Quality and acceptance of decisions can improve if managers can make timely and informed decisions, explain decisions to the staff and listen to the opinion of them before decision-making.

Appropriate supervisory skills significantly improve the behaviour and commitment of individuals.

Necessary information should be delivered to each level of the organization without distortion.

Every effort should be made for continual improvement of performance.

Appropriate motivation may modify the behavior and attitude of the staff.

3.4.4.2 Behavior of staff

Staff should adhere to high standards of professionalism.

Staff should be familiar with their assigned, should be skilled to perform their tasks (they should notify their supervisor if not).

Procedures represent cumulative knowledge and experience. It is important that they are followed to avoid repeating errors. Potential errors should be immediately corrected.

Teamwork, extensive interpersonal interaction improves the effectiveness of the organization.

Detection sub-function of the physical protection system is also supported by the vigilance and observational skills of the employees.