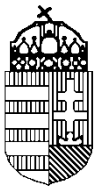
Hungarian Atomic Energy Authority



Guideline 4.17

Emergency preparedness in the nuclear power plant

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PREAMBLE

The legal hierarchy of nuclear safety regulations in Hungary is as follows:

1. The uppermost level is represented by the Act CXVI of 1996 on Atomic Energy (Atomic Act).

2. The next level basically consists of two government decrees issued as executive orders of the Atomic Act. The 114/2003. (VII.29.) Korm. government decree defines the legal status of the Hungarian Atomic Energy Authority (HAEA), while the 89/2005. (V.5.) Korm. government decree specifies the HAEA's generic procedural rules in nuclear safety regulatory matters. The nuclear safety code consists of seven volumes, which are issued as the annexes of this latter decree. The first four volumes address the NPP, the fifth one the research and training reactors, whilst the sixth volume addresses the spent fuel interim storage facility. These six volumes determine the specific nuclear safety requirements, whilst the seventh volume contains the definitions applied in the code. The regulations are mandatory; failing to meet any of them is possible only in those specific cases that are identified by the decree.

3. The regulatory guidelines constituting the next level of the regulatory system are connected to one of the volumes of the code. The guidelines describe the method recommended by the proceeding authority for meeting the requirements of the nuclear safety code. The guidelines are issued by the director general of the HAEA, and they are regularly reviewed and reissued based on accumulated experience. So as to proceed smoothly and duly the authority encourages the licensees to take into account the recommendations of the guidelines to the extent possible.

4. In addition to the described regulations of general type, individual regulatory prescriptions and resolutions may also address specific components, activities and procedures.

5. The listed regulations are obviously supplemented by the regulating documents of other organizations participating in the use of nuclear energy (designers, manufacturers, etc.). Such documents are prepared and maintained in accordance with the internal quality assurance system of the user.

Before applying a given guideline, always make sure whether the newest, effective version is considered. The effective guidelines can be downloaded from the HAEA's website: http://www.haea.gov.hu.

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1. INTRODUCTION

1.1. Scope and objective of the guideline

In accordance with Articles 42-44 of the Atomic Act the licensee of the nuclear power plant is responsible for performing the emergency response activities on the site of the plant. The licensee should react timely and effectively, under appropriate command and control, in a coordinated way to any radiological and nuclear emergency (in what follows nuclear emergency or emergency).

The guideline provides recommendations of the authority with regard to the potential manner of fulfillment of the regulations prescribed in Chapter 8.4 of Volume 1, Chapter 5.6.4 of Volume 3 and Chapters 15 and 16 of Volume 4 of the NSC.

The guideline relates to preparedness for on-site emergencies of a nuclear power plant located in the territory of the Republic of Hungary and to implementation of emergency response tasks; it does not relate to accident management.

The content of this guideline as the good practice of emergency preparedness is taken into account by the HAEA NSD during its regulatory procedures (approval of the nuclear emergency response plan, supervision of emergency preparedness).

The nuclear power plant is categorized to the highest emergency planning (threat) category by the National Nuclear Emergency Response Plan (NNERP). The recommendations of the guidelines consider this categorization.

2. DEFINITIONS

This chapter excludes those definitions which are already described in the relevant volume of the NSC.

Emergency Response Organization:

Organization with appropriate responsibility and authority, which sets up subsequent to the declaration of an emergency and it is able to perform the tasks from decision making to implementation of operative actions.

Nuclear emergency situation:

Such situation resulted by an extraordinary event, which requires or may require actions in order to prevent or mitigate the consequences affecting the population. The term of nuclear emergency includes also emergency situations occurring as a consequence of activities relating to nuclear or other radioactive materials; accordingly the nuclear emergency situation (NES) refers both to a nuclear emergency situation and to a radiological emergency situation.

2.1. Abbreviations

ERP	Emergency Response Plan
ERO	Emergency Response Organization
STIR	Situation and Technological Information Report
INES	International Nuclear Event Scale
NSC	Nuclear Safety Code
NES	Nuclear Emergency Situation
HAEA NSD	Hungarian Atomic Energy Authority Nuclear Safety Directorate
NNERS	National Nuclear Emergency Response System
FSAR	Final Safety Analysis Report
ALARA principle	Principle of As Low As Reasonably Practicable

3. EMERGENCY PREPAREDNESS

The scope of the licensee's responsibility and authority with respect to emergency planning, preparedness, response and protection covers the site and those who are at present on the site.

3.1. Objective of emergency response

In accordance with Article 16.001 of Volume 4 of NSC the objective of emergency response is to mitigate the consequences of an emergency situation taken place; accordingly prevention of deterministic effects and limitation of stochastic health effects as low as reasonably achievable on the personnel of the facility and on the population, and minimization of other consequences resulted by the emergency.

In order to meet the above objectives the licensee, within the site of the nuclear power plant, should be prepared for realization of the following tasks:

a) Management of the recovery of the occurred emergency situation, execution of response measures, prevention of further development of the emergency.

b) Prevention and mitigation of adverse consequences.

c) Prevention of deterministic effects and limitation of stochastic health effects as low as reasonably achievable on the personnel of the facility and on the population.

d) Provision of first aid to injured persons and treatment of radiation injured persons.

e) Implementation of mustering and evacuation tasks, finding of missing persons.

f) Protection of the environment and assets in the highest reasonable extent.

g) Execution of decontamination tasks.

h) Execution of alarming and notification tasks.

i) Execution of recovery tasks.

3.2. Objective of emergency preparedness

In order to fulfill the emergency response objectives the licensee should provide resources that are necessary for the coordinated and effective execution of the emergency response activity in due time and in adequate locations, under effective command and control. The available resources should be utilized in trained and practiced manner in order to improve effectiveness.

3.3. Principles of emergency response

The licensee should take into account the principle of justification and optimization in order to support the emergency response measures to be implemented:

a) a protective action to be implemented is justified, if it results in more good than harm,

b) a protective action to be implemented is optimized, if its form, extent and duration are determined by taking account of the maximum benefit.

3.4. Emergency Response Plan

In accordance with Sub-article 15.001/e of Volume 4 of NSC the licensee shall elaborate a facility emergency response plan (in what follows ERP) for the site, and maintain it in up-to-date state. The licensee should take into account the experience of operation and exercises; it should ensure the continuous compliance with effective laws, national, regional and local emergency response plans, and with the fire protection plan and plans of protection against other type of catastrophes.

The licensee should regulate the fulfillment of requirements for emergency response in its internal documentation system. The most important element of the internal regulations of emergency response is the facility ERP, which regulates in detail the preparedness and response activity of the facility. The ERP may include references to other documents of the facility (e.g. Facility Radiation Protection Rules, procedures, executive instructions, etc.). In accordance with Article 15.004 of Volume 4 of the NSC the ERP and its subordinated documents shall regulate every action to be executed during the emergency preparedness and response activity.

At minimum the facility ERP shall include:

a) scope of responsibility, task, structure and operation of the organization responsible for the realization of the plan,

b) boundaries of emergency planning zones,

c) precise criteria and procedure for declaration and termination of an emergency,

d) threat sources identified during threat assessment,

e) emergency classes, technological and radiation protection criteria for classification, procedure and executor of emergency classification,

f) method and tools of emergency evaluation,

g) procedure and tools of emergency communication on-site and off-site,

h) method and tools of alarming the on-site and off-site organizations and persons,

i) method and tools of preparation of the public; the public information plan,

j) list of equipment available for emergency response,

k) principles of emergency management,

l) on-site protective actions and criteria for their implementation,

m) rules of monitoring and evaluation of radiation conditions, specification of levels not requiring intervention and the obligatory intervention levels, procedures and method aiming at reduction of radiation exposure,

n) criteria for implementation of immediate protective actions in relation to protection of the population; mode and method of decision support,

o) rules of cooperation with NNERS organizations,

p) rules of emergency response trainings and exercises.

In order to comply with the regulation the licensee should follow the legal changes with regard to the nuclear power plant and the NNERS. The licensee should collect the lessons learned from exercises, trainings, inspections executed since the last revision and from other sources, and accordingly review the facility ERP at least once every two years.

3.5. Modification of the ERP

Pursuant to Sub-article 4.013 of Chapter 4 of Volume 4 of the NSC the

modification of the ERP is qualified as a modification requiring regulatory approval.

The licensing of the ERP, pursuant to Article 4.06 of Volume 1 of the NSC can be merged to a one-stage licensing process, if the license application includes all information necessary for granting the individual licenses. In accordance with the relevant articles of Volume 1 of the NSC the joint license application for ERP modification shall include the following information:

In accordance with Article 4.031 of Volume 1 of the NSC:

a) reason for and justification of the modification,

b) requirements for modification as defined in the Nuclear Safety Code, other effective laws, Final Safety Analysis Report (FSAR) of the facility and in the documentation supporting the modification,

c) description of the modification,

d) fulfillment of requirements listed in sub-paragraph b) above,

e) declarations about consideration of prescriptions and requirements,

f) quality assurance requirements to be realized in relation to the modification,

g) planned schedule of realization of the modification,

In accordance with Article 4.041 of Volume 1 of the NSC:

h) changes becoming necessary in the internal regulation system due to the modification; schedule and presentation of these changes,

i) draft text to be introduced during the annual revision of the Final Safety Analysis Report due to the modification,

j) training programme required by the modification, demonstration of the adequacy of the programme (lessons to be learnt, involved job positions, schedule, verification method for fulfillment of training objectives),

k) denominations and identifiers of license(s) issued by the authority in relation to the licensing procedure, and of documents supporting the license application that were formerly submitted to the authority.

3.6. General considerations

In accordance with Sub-article 15.001/a of Volume 4 of the NSC the licensee shall establish an organizational unit with appropriate responsibility and authority for maintenance of the emergency preparedness on high level, which organizes and directs the process of emergency preparedness. In order to fulfill this regulation the licensee should provide:

a) establishment of an organization with appropriate human resources and competence, which works under normal operational and command rules,

b) resources for emergency preparedness, their annual planning,

c) internal regulations on availability of emergency response equipment and facilities,

d) elaboration of regulating documents (procedures, instructions and guidelines) for emergency response tasks.

In accordance with Sub-article 15.001/b of Volume 4 of the NSC the licensee shall establish an emergency response organization with appropriate responsibility and authority, which shall be well prepared for activation in an emergency situation (and during exercises supporting the preparation for response tasks), and which shall be capable to fulfill its tasks from decision making on-site to the implementation of operative actions. In order to fulfill this regulation the licensee should provide:

a) establishment of an organization with appropriate human resources and competence,

b) assignment of a single person who leads the organization, and declaration of his/her personal responsibilities,

c) command structure of the organization, elaboration of operational rules (on appropriate documentation level) that regulate its operation and activity,

d) establishment of rules for alarming and stand-by state of the personnel of the organization, and for shift changing of the set-up organization,

e) recording of the operation of the organization,

f) elaboration of internal regulations for execution of emergency response tasks,

g) technical conditions, resources and equipment available for the organization in order to fulfill its tasks on an appropriate level.

In accordance with Article 15.001 of Volume 4 of the NSC, the organization managing the process of emergency preparedness shall be responsible for:

a) elaboration and maintenance of the ERP and the documentation regulating the execution of tasks,

b) maintenance of tools, materials, facilities and documents required for the execution of emergency response tasks; especially the functionality of the main and reserve emergency command centers, and regular inspection of their appropriateness,

c) planning and execution of emergency response trainings and exercises,

d) liaison with external organizations during the preparedness phase.

During the elaboration and revision of internal regulations of emergency response the licensee should ensure the participation of internal organization having duties in response, and it should take into account the feedback received form external contributors.

The licensee should ensure in its internal regulations that safety related works on the site that are executed by external contractors can be made only with supervision of the organization of the licensee. The emergency rules applied by external contractors should be in harmony with the internal regulation of the licensee and they should be appropriately professionally reviewed by the licensee prior to that the external contractors commence their work. In the case of a potential or actual emergency situation the licensee should ensure the clear authority of internal and external decision making levels and harmonize them with the direction of the emergency response activity.

In accordance with Sub-article 15.001/d of Volume 4 of the NSC the licensee shall associate more than one employee assigned in advance to every position of the emergency response organization. The number of staff of the organization and the number of employees available as substitutes should be determined in such a way that the necessary number of personnel and the necessary qualification will continuously be available for the operation of the organization.

In order to comply with this regulation the licensee should regulate in writing the requirements for identification of the personnel of the organization and maintain up-to-date record on employees assigned to each position. The licensee should specify the knowledge necessary to fulfill each position and demonstrate in the record that every member of the organization does fulfill the qualification requirements.

The licensee should coordinate the emergency response to on-site emergency situations with other disaster management tasks; additionally the licensee should coordinate the execution of the on-site tasks of emergency preparedness with the execution of these tasks by off-site emergency organizations. Accordingly, the licensee should establish an appropriate command structure for coordination of the on-site activity of the emergency response organization and disaster management organizations, and for adequately supporting the off-site emergency response activity.

In accordance with Article 16.004 of Volume 4 of the NSC the emergency response organization of the licensee shall be activated promptly after the declaration of the emergency, without any delay. The activity should be organized and managed in a way that the consequences of the declaration of the emergency situation and the emergency response activity do not hinder or endanger the work of the operating personnel during execution of operational activities, the safe operation and the performance of safety functions.

During the emergency response activity the licensee should continuously verify the availability of resources (human resources, equipment, vehicles, etc.) required for implementation of emergency response measures.

3.7. Threat assessment, emergency classification

The licensee should conduct a threat assessment by taking account of every initiating event postulated in the FSAR; the threat assessment should cover derived risk sources and should take into account the effects of conventional emergencies. The threat assessment should be conducted as to provide a basis for clearly establishing the necessary extent of emergency preparedness.

In accordance with Article 3.031 of Volume 3 of the NSC the licensee shall categorize the threat identified during threat assessment into emergency planning categories (threat categories) on the basis of their potential

severity. The emergency planning categories are defined in the National Nuclear ERP. The categorization should serve as a basis for establishing the extent of emergency preparedness. The licensee should prepare for being capable to respond to any emergency situation identified by the threat assessment and ensure the timely execution of the appropriate measures (classification, notification, activation and emergency response activity).

In accordance with Article 15.003 of Volume 4 of the NSC the on-sire emergency response plan shall cover the response to each emergency situation (entailing release of radioactive materials, direct on indirect radiation exposure) identified in safety analyses, and the actions aiming at mitigating the consequences that are decided under the responsibility of the operating organization.

In order to comply with the above prescriptions the licensee should identify the full scope of emergencies that may potentially occur in the facility, elaborate the analysis of emergency situations. The licensee should ensure that the scope of events considered during emergency preparedness should cover every threat identified in the FSAR.

In the scope identified by threat assessment the licensee should demonstrate that the objectives of emergency response are met in relation to the identification of events, initiation and execution of emergency response activity.

In accordance with Article 8.047 of Volume 1 of the NSC the licensee shall determine the emergency class within 15 minutes subsequent to the occurrence of a nuclear emergency, natural or industrial catastrophe. In accordance with Article 15.005 of Volume 4 of the NSC the licensee shall be prepared for identification of nuclear emergencies and the prompt commencement of nuclear emergency response activity. Accordingly, the licensee should elaborate, in line with the National ERP, an emergency classification system, in which emergencies that are categorized to the same class should mean approximately identical threat.

In order to fulfill the above regulation the licensee should be prepared for classification of and notification on emergencies; it should specify the conditions and procedure of the required internal and external information flow. In the frame of this the licensee should ensure that the emergency classification will be executed within 15 minutes subsequent to he occurrence of the event.

The licensee should specify the scope of measures belonging to defined emergency classes, and it should be prepared for commencement of emergency response on the appropriate level. The licensee should establish a classification system for emergency classification of events, which should distinguish the following emergency classes:

General emergency: It is resulted by such events that involve an actual or substantial risk of release of radioactive material or radiation exposure that warrants taking urgent protective actions off the site. Upon declaration of this class of emergency, actions shall be promptly taken to mitigate the consequences and to protect people on the site and within the precautionary action zone and urgent protective action planning zone. This emergency class covers the actual or potential damage to the rector core or to high quantity of spent fuel, or occurrence of such an off-site release which results in dose exceeding the intervention levels for urgent protective actions.

Site are emergency: It is resulted by such events that involve a major decrease in the level of protection for those on the site and near the facility. Upon declaration of this class of emergency, actions shall be promptly taken to mitigate the consequences, to protect people on the site and to make preparations to take protective actions off the site if this becomes necessary. This emergency class includes the significant decrease of the defense of the rector core or high quantity of spent fuel, or occurrence of such circumstances under which any additional failure may lead to damage to the core or spent fuel, or occurrence of such high radiation level on the site, which approaches the urgent intervention levels.

Facility emergency: It is resulted by such events that involve a major decrease in the level of protection for people on the site. Upon declaration of this class of emergency, actions shall be promptly taken to mitigate the consequences and to protect people on the site. Emergencies in this class can never give rise to an off-site threat.

Alert: It is resulted by such events that involve an uncertain or significant decrease in the level of protection for the public or people on the site. Upon declaration of this class of emergency, actions shall be promptly taken to assess and mitigate consequences and to increase the readiness of the on-site and off-site response organizations, as appropriate.

Other radiological emergency: Summary class of such emergencies, which are resulted by localized, slowly developing or radiation threat of limited

effect. Such typical situations are: loss of radioactive material (e.g. source), found/detected dangerous radioactive materials (e.g. hot spot), accident during transport of spent fuel or radioactive waste, terrorist threat, or elevated radiation level due to other reasons.

In accordance with Article 16.004 of Volume 4 of the NSC the established protective actions shall be promptly executed in the facility subsequent to the classification of the event. Accordingly, the licensee should commence the execution of the coordinated and planned on-site emergency response tasks on the appropriate level, and initiate the execution of the off-site emergency response activity.

The licensee should clearly define the responsibility, tasks, immediate and urgent measures of the emergency response organization for each emergency class.

During the classification of emergency situations the licensee should be prepared for simultaneously taking into account the below aspects:

a) potential threat sources identified on the site area of the facility, occurrence of an event leading to the identified emergency,

b) other, abnormal operating states,

c) decrease of the level of safety (e.g. degradation of engineering barriers), or its risk,

d) decrease of the level of physical protection,

e) decrease of the level of protection for site personnel, or its risk,

f) value of radiation level or its elevation measurable on and off the site, or risk of its elevation,

g) whether radioactive release occurred or may occur,

h) whether the management of the emergency situation requires protective actions on and off the site, their extent and urgency.

Principles of emergency classification:

a) the emergency classification should primarily based on measurable parameters;

b) among technological and radiological parameters, and other circumstances that one is the determinant which justifies a higher class of emergency;

c) events and circumstances categorized to the same emergency class should mean approximately identical threat.

Based on the above aspects and principles the licensee should define the criteria for emergency classification and establish a group of actions for every emergency class.

During the emergency the licensee should review the classification regularly (at least every 2 hours) and/or if alteration occurred in the above aspects.

In accordance with Article 15.006 of Volume 4 of the NSC a person shall be available on the site area of the facility, who is entitled to classify the emergency, declare the emergency and its termination, initiate emergency response measures and to notify off-site organizations; this person should possess the information necessary for the effective management and authority above the equipment necessary for the implementation of the listed tasks.

The licensee should elaborate a procedure for emergency classification, in which it should take into account the above regulations and recommendations.

The licensee should precisely and unambiguously determine the process of transition from normal operation to emergency operation. It should provide every person on the site with information on the declaration of the emergency; every person should be aware of his/her duty if a given emergency class is declared.

The licensee should precisely and unambiguously determine the process and criteria for termination of the emergency. It should provide every affected person and organization with information on the termination of the emergency.

3.8. Emergency planning zone, release, environmental assessment, protective actions

The emergency planning zones around the facility correlate with geographical, population density and public administration circumstances.

The zones have concentric shape around the facility; their names with the distance from the facility are precautionary, urgent and long term protective action zone.

In accordance with Article 15.007 of Volume 4 of the NSC the licensee shall be prepared, in the precautionary and urgent protective action zones for alarming the public, elaboration of urgent protective actions, and for professional decision support towards the defense committees that are responsible for emergency response in the urgent protective action zone.

In order to comply with the above regulation the licensee should develop the procedure, equipment and basis for selection of potential urgent protective actions in precautionary and urgent protective action zones; it should establish the communication mode and the frames of decision support towards the defense committees and local mayors.

In the frame of preparation for implementation of protective actions, the licensee should:

a) specify the scope and extent of applicable, potential and urgent on-site protective actions, and define the selection criteria,

b) provide the appropriate method, equipment and craft for elaboration of urgent protective actions,

c) identify those information (radiological situation, meteorology, protective actions) to be provided to support the decision making of defense committees, which are necessary for implementation of protective actions,

d) provide professional support during the emergency towards off-site organizations responsible for emergency response.

In accordance with Article 15.009 of Volume 4 of the NSC the licensee shall be prepared for the assessment of technological and radiological parameters of the emergency and for estimation of the consequences of an actual or potential release. The assessment should be based on measured data, as appropriate. The assessment should support the unambiguous determination of protective actions required for the protection of the personnel being on-site and the population living off the site.

During an emergency the licensee should supervise the radiation exposure of personnel in compliance with principles of constraints, justification and

optimization. Accordingly, the licensee should specify for the site:

a) procedures and methods for monitoring and evaluating the on-site radiological situation (monitoring, diagnosis, prognosis, estimation of consequences),

b) action levels by taking account of intervention levels,

c) procedures and methods in relation to reduction of radiation exposure during an emergency,

d) scope of measures serving for decreasing the release of radioactive materials, criteria for releasing radioactive materials,

e) radiological conditions of termination of an emergency.

The protective actions to be implemented during an emergency should be based on radiation protection principles by taking account of the technical state, meteorological condition and other circumstances. In the early phase of an emergency, until the off-site emergency organizations renounce it the licensee should provide the following information in order to support the off-site decision making on protective actions:

a) continuous evaluation of technological and radiological parameters of the emergency, and of local meteorological data,

b) regular review and forecast of the evolution of the nuclear and radiological situation,

c) regular review of the release (source term estimation),

d) prognosis on potential consequences that might be expected based on the analyses,

e) decision support regarding protective actions by taking account of the results of already implemented protective actions.

In the late phase of an emergency the licensee should continuously assess and forecast the technological and radiological situation.

In order to comply with the above regulations the licensee should provide method, analysis tools and craft for:

a) estimation of the release of radioactive materials,

b) determination of on-site and off-site consequences of the emergency.

For the radiological assessment and fulfillment of its response tasks the licensee should:

a) operate a monitoring system on the site and off the site around the nuclear power plant, which is applicable for alerting, includes meteorological measurement; the measurement data should be applicable to support recommended protective actions,

b) possess appropriate methods and tools for soil and air sampling and for evaluation of such samples,

c) possess transportable measurement instruments, which can be connected to appropriate communication equipment, together with the associated transport technique (radiation protection measurement vehicle),

d) elaborate a plan for monitoring during an emergency, provide the tools necessary for monitoring.

3.9. Emergency response infrastructure, tools and equipment

In accordance with Article 15.010 of Volume 4 of the NSC the licensee shall locate the tools (hand-tools and documents) necessary for emergency response actions at closest to the place of their expected use, in order to ensure their effective use under the postulated circumstances.

The licensee should provide the personnel involved into the work of the emergency response organization with appropriate work environment, work place, necessary protecting equipment, and the appropriate site layouts and blueprints for improving their local knowledge.

The licensee should ensure the up-to-date status of the list of facilities, tools, equipment, materials and instruments assigned to emergency response activity (altogether the emergency response infrastructure). Depending on the average number of personnel on the site, the number of personnel of the emergency response organization and on the tasks to be executed the licensee should specify the necessary quantity of elements of the list, the purpose of their use and locations of their storage; if appropriate it should provide their user manual, operating and maintenance manual. In the case of equipment in storage the licensee should specify the procedure and criteria for their utilization.

In accordance with Articles 5.200 and 5.201 of Volume 3 of the NSC the

licensee shall support the effective work of managers of the emergency response organization by appropriate technical and communication environment. Consequently, it should establish an emergency command center. The emergency command center should provide sufficient instrumentation and equipment for execution of emergency response measures. The emergency command center should be equipped with such a diverse and redundant communication system, which is applicable to alarm the off-site organizations responsible for emergency response and to communication with the unit control room as well as with the reserve and the emergency control room, other important locations of the plant and to communication with the off-site emergency response organizations. The licensee should provide the personnel working in the emergency command center with appropriate protection against the harmful effects of an emergency by appropriate arrangements as reasonably practicable and for the reasonable period of time.

In order to fulfill this requirement the emergency command center established by the licensee should be equipped with uninterruptible power supply, its operation should be sustained for sufficient period with filtered air ventilation, and the access to the center should be controlled during an emergency situation.

In accordance with Article 5.011 of Volume 4 of the NSC the licensee should be prepared for recording the events, executed measures and the content of communication during an emergency.

The licensee should ensure the availability and functionability of the following items during the establishment of the emergency response infrastructure:

a) protection facilities and individual protecting equipment as defined by the corresponding catastrophe management and civil defense laws,

b) tools and equipment necessary for the response activity,

c) information necessary for managing the response activity in the emergency command center (e.g. facility parameters, measurement results, meteorological data),

d) on-site alarming and communication tools,

e) tools applicable to inform and alarm the public,

f) communication tools assigned to notify the regional and national defense organizations responsible for off-site emergency response, and to the communication therewith,

g) methods and tools applicable to diagnosis and prognosis of the state of the facility and to estimate the radiological consequences,

h) tools necessary for first aid provision to persons injured conventionally but who are contaminated or exposed at the same time,

i) instruments recording events and occurrences,

j) logistical equipment needed for the response activity (repair, fire fighting, transport, evacuation, etc.).

The licensee should continuously maintain the operability of the above specified emergency response infrastructure; accordingly the licensee should ensure the regular and documented inspection of functionability of every item.

The licensee should:

a) demonstrate the applicability of rooms of the emergency command center and other protection facilities by compliance inspection and verification in accordance with the corresponding law (Ministerial decree 22/1992. (XII.29.) KTM);

b) regularly, but at least once a month demonstrate the operability of the public information and alarm system and off-site and on-site communication tools by inspection;

c) review, at least once every two year the ERP and other emergency response documents based on the feedback of lessons learned from exercises and inspections, the alterations of operational or legal circumstances, and on the technical developments; or demonstrate that unnecessary to review them;

d) specify the frequency of regular inspections of equipment not mentioned above depending on their importance and the period of their warranted operability, but at least once a year the licensee should inspect in documented manner their operability, functionability and validity of warranty;

e) develop and implement an action plan with deadlines in order to correct defects and deficiencies revealed during inspections.

3.10. Alarming and communication

In accordance with Article 8.046 and 8.047 of Volume 1 of the NSC the licensee shall notify the relevant organizations of the NNERS within 30 minutes subsequent to the occurrence of the emergency. The notification shall be made via phone by defined manner and content. The notification shall be confirmed in writing via fax by the licensee within 60 minutes as latest subsequent to the occurrence of the emergency. Besides the written confirmation of the notification the fax message shall include the available information on the circumstances of the emergency. After the execution of the alarming tasks the licensee shall regularly inform the assigned organizations of the national nuclear emergency response system. The licensee shall prepare and submit reports on situation and technological information as dictated by the evolution of the emergency but at least every 1.5-2 hours, or give information in any other way which is equivalently capable to provide information necessary for the independent evaluation of the emergency situation. In accordance with Article 16.006 of Volume 4 of the NSC the licensee shall continuously inform the off-site emergency response organizations about the evolution of the emergency situation and status of the implementation of the on-site protective actions.

In order to fulfill the above requirements the licensee should be prepared for alarming the NNERS organizations. Consequently, the licensee should prepare internal regulation of the appropriate level, and ensure the availability of the communication equipment and addresses that are necessary for alarming. The availability of equipment and the up-to-date status of the address-list should be inspected at least once a month in a documented manner.

The licensee should establish a template (form) for reporting on situation and technological information for notification on the occurrence of an emergency and for emergency communication, which can be filled in quickly and which is applicable to provide the off-site emergency response organization with information necessary for diagnosis and prognosis of the nuclear and radiological situation, estimation of the potential or actual radioactive releases and for supporting the decision making on necessary protective actions.

The licensee should provide access for the HAEA Emergency Response Organization to technological, radiation and available metrological data through automatic data connections. The licensee should be prepared for providing the data through other channels (fax, E-mail) if the above data connections fail.

In relation to alarming and communication the licensee should:

a) establish the communication and alarming equipment with adequate operability in compliance with requirements for redundancy and diversity,

b) define the procedure of alarming, the scope of persons affected by alarming, the information to be declared during alarming,

c) precisely define the criteria for alarming and prepare for documentation of alarming,

d) ensure the appropriate equipment for on-site alarming and communication (e.g. communication with personnel executing the response activity) and for pre-defined emergency instructions,

e) define the procedure for alarming the off-site organizations, the equipment used for communication with them and the content of information within its internal regulations,

f) organize, in cooperation with off-site emergency response organizations the content and frequency conditions and requirements for alarming and information of regional defense committees of neighboring counties in the urgent protective emergency action zone,

g) establish communication with off-site organizations in such a way that requires the minimum resources from the organization.

3.11. Public and media information

In accordance with 15.012 of Volume 4 of the NSC the licensee shall be prepared for public and media information pursuant to the corresponding law (Gov. decree 165/2003. (X.18.) Korm). The licensee shall continuously provide the public with appropriate information during the response to the emergency.

The licensee should provide the population living around the plant with preliminary information on emergency protective actions.

In order to comply with the quoted prescriptions the licensee should elaborate its Public Information Plan as part of its ERP in harmony with the National Public Information Plan, in which it should define the rules of public alarming and information, and the content requirement thereof.

The licensee should be prepared for informing the media, for holding regular press conferences and issuing press releases. Accordingly, the licensee should specify the content requirements for information and press releases, and organize links with the media (primarily with the public television and radio). This latter links should be regularly tested in a document manner.

Pursuant to the requirements of Chapter 8.3.3 of Volume 1 of the NSC the licensee shall be prepared for the as fast as possible INES classification of the nuclear emergencies.

3.12. Protection of workers

In accordance with Articles 5.202-5.204 of Volume 3 of the NSC the licensee shall ensure individual protecting equipment necessary for the protective actions to be implemented on the site. The licensee shall establish an on-site alarming system that is applicable to alarm every person being at present on the site, and clearly and permanently indicated, sufficiently lighted and safe evacuation routes in compliance with the labor protection, radiation protection, fire protection, facility protection and industrial protection requirements. The licensee shall establish appropriate protection facilities for the workers involved in emergency response activity in compliance with the civil defense requirements and with the number of affected personnel.

In order to protect the facility personnel the licensee should:

a) list the potential protective actions (e.g. iodine blocking, sheltering on the site, evacuation) and define the criteria for their implementation,

b) elaborate an evacuation plan for the persons being at present on the site but not participating in emergency response activities; provide appropriate protecting equipment for evacuation,

c) prepare for measurement of the surface contamination of workers, monitoring of their internal radiation exposure, and in the case of contamination for their decontamination.

d) prepare for determination, estimation of dose received by workers not participating in emergency response.

In accordance with Article 15.008 of Volume 4 of the NSC the licensee shall be prepared for treatment (first aid, dose estimation, transport) under emergency circumstances of limited number of contaminated and injured persons exposed to radiation.

In order to protect the personnel participating in emergency response the licensee should:

a) provide the personnel participating in emergency response with dosimeters applicable to indicate a pre-defined dose and dose-rate, regulatory dosimeters to be evaluated later and with appropriate personal protecting equipment,

b) provide the continuous operation by organization of shift changes,

c) take care of realization of ALARA principle in regard to those participating in emergency response;

d) define procedures and methods in relation to protection of workers and decrease of their radiation exposure; define the scope of potential protective actions and criteria for their implementation;

e) take care of recording doses received during emergency response;

f) support, by providing available information the ambulance, health and remedial organizations with regard to activities under conditions of elevated radiation level; prepare for provision of information necessary for their actions.

3.13. Emergency response training and exercises

In accordance with Articles 15.013 and 15.014 of Volume 4 of the NSC the licensee shall:

a) train each person for general emergency response who can stay on the site of the facility without supervision, in the frame of which each person shall be trained for measures to be implemented during an emergency; organize annual refreshing trainings in order to refresh knowledge and present modifications,

b) hold annual professional and practical training for personnel participating in the emergency response organization in order to learn and practice their duties to be fulfilled as a member of the emergency response organization,

c) annually plan the emergency trainings and exercises,

d) test the preparedness of the emergency response organization by regular exercises, their lessons learned should be considered during the emergency preparedness activity,

e) annually held a large-scale exercise with the involvement of the entire organization, into which the off-site organizations should be also involved.

The licensee should annually prepare an emergency response training and exercise plan, which should be submitted to the nuclear safety authority for approval by 15 December of the year preceding the subject year.

The licensee should maintain record of participants of trainings and exercises.

The licensee should evaluate the trainings and smaller exercises together at the end of the given year, whilst the larger exercises should be evaluated individually; the evaluation report should be submitted to the authority for information; the evaluation results should be utilized for further development of emergency preparedness.

In the frame of emergency response training the licensee should:

a) verify the effectiveness of the general emergency response trainings by exams,

b) organize regular trainings in specific professional areas (refresher, modification presentation and knowledge improvement trainings) to personnel involved into emergency response about their emergency response duties.

The licensee should organize, at least once a year such an emergency exercise which involves the participation of the entire emergency response organization. The objective of this type of exercise is to demonstrate the appropriate emergency preparedness of the licensee and within that of its ERO, and the appropriateness of the emergency response infrastructure. The exercise should cover every planned activity, as appropriate. During the

preparation and conduction of exercises the licensee should provide the off-site organizations with possible participation and consider their interests.

The licensee should conduct several small exercises during the year with the involvement of certain units in order to practice the communication and specific tasks (especially in relation to alarming, emergency communication and emergency classification). In relation to these drills the licensee should specify specific objectives.

At least once a year the licensee should conduct alarming exercise in order to practice the alarming and evacuation of personnel; however the alarming drill may connect to the large-scale scope exercise.

During the preparation of exercises the licensee should strive after the participation of every worker involved into emergency response in at least one exercise once every two years.

Prior to exercises the licensee should prepare a plan, in which the objective, date and time, participant and other important circumstances should be presented.

The participants should act individually (without facilitation) during exercises; an important aspect is that the exercising personnel should not be aware of the scenario of the exercise in advance.

The exercises should be evaluated by evaluators, who are independent of those organizing the exercise; in line with an evaluation plan prepared in advance. The licensee should develop an action plan with deadlines for utilization of the lessons learned.

3.14. External relations

The licensee should plan the involvement of external response forces (fire fighters, ambulances, defense forces, law enforcement forces, railway, other technical support: e.g. cranes, trucks) in advance; the licensee should define the criteria and method for utilizing the support provided by external forces.

The licensee should train and prepare the external forces in relation to the specialties of a nuclear emergency in comparison to the characteristics of conventional emergencies. In order to sustain awareness, the training and preparation should be repeated annually.

3.15. Recovery after a nuclear emergency

The licensee should elaborate a plan for recovery measures arising after the termination of a nuclear emergency. Accordingly, the licensee should:

a) determine the communication tasks after the termination of an emergency;

b) establish measures for identification of damages resulted by an emergency;

c) establish measures for reviewing the radiological consequences of an emergency;

d) develop measures for monitoring, confining and cleaning up decontaminated areas on the site;

e) establish measures for radiation protection monitoring of workers exposed during response;

f) prepare for providing professional support for execution of off-site recovery tasks.

The planning of the concrete recovery tasks should be commenced even during the emergency, but it should not interfere with the response to the emergency.

The recovery after termination of the emergency should be performed pursuant to quality management documents (regulations, instructions, procedures) of the normal period of the facility.