

REGULATION ON RADIOACTIVE WASTE MANAGEMENT

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SECTION ONE

Purpose, Scope, Bases and Definitions

Purpose

ARTICLE 1- (1) The purpose of this regulation is to regulate the rules on safe management of radioactive wastes which may arise during the use of nuclear energy as well as sources of ionizing radiation in order to protect the public, the environment and the future generations.

Scope

ARTICLE 2- (1) This regulation applies to activities and facilities related with radioactive waste management.

(2) For the activities which are not within the scope of use of nuclear energy and ionising radiation sources but may generate radioactive wastes, the applicable articles of this regulation are valid.

Legal Basis

ARTICLE 3- (1) This regulation has been prepared on the bases of the Article 4, paragraphs (e) and (f) of the Turkish Atom Energy Authority Law issued in the official gazette on 09/7/1982 and numbered 2690.

Definitions

ARTICLE 4- (1) The following definitions apply to the terms used throughout this regulation:

a) Barrier: A physical obstruction natural or engineered that prevents or delays the movement of radionuclides, or provides shielding against radiation.

b) Disposal: Final storage of radioactive waste in an appropriate manner without any purpose of retrieval. The term also includes controlled release of gaseous and liquid wastes to the environment.

c) Disposal facility: Facilities the primary purpose of which is to dispose radioactive wastes; surface, near surface, intermediate depth and deep disposal facilities.

ç) Release to environment: Disposal of radioactive gaseous and liquids the activities of which do not exceed certain limits by means of planned and controlled releases into the environment.

d) Multiple barriers: Two or more nested barriers used in a radioactive waste facility

e) Storage: The holding of radioactive waste in a system or facility that provides for its containment, with the intention of retrieval.

f) Deep disposal facility: Facility for the radioactive waste disposal and located a few hundred meters or deeper from the surface in stable geological structures in order to ensure long term isolation of radionuclides from the biosphere.

g) Regulatory control: The Authority's regulatory actions such as inspection, control and evaluation on the activities notified to the Authority and for which permissions have been obtained, with the purpose of ensuring nuclear safety and security, waste and transport safety and protection of individuals, society and the environment against radiation.

ğ) Secondary waste: Radioactive wastes produced during the processing of radioactive waste.

h) Processing: Activities including pretreatment, treatment and conditioning steps applied to radioactive wastes.

i) Decommissioning: All activities aimed at removal of nuclear and radioactive materials from the facility, dismantling of the facility and removal of the site from the regulatory control, implemented within a certain programme after decision is made for any facility apart from a disposal facility, that it will no longer be operated.

i) Closure: All administrative and technical activities including engineering or other works to render the facility safe in the long term with the aim of closing the facility with no intention of retrieval of the waste therein, carried out within a certain programme after termination of operation in a disposal facility.

j) Source materials: Uranium which includes natural isotopes; Uranium the U-235 isotope of which is below the natural level; Thorium; their metal, alloy, chemical compound or condensed forms; and materials containing any one or more of these at a ratio determined by IAEA board of directors or the Authority.

k) Restricted use: After removal of the site from the regulatory control, use of the site within the scope of restrictions on land use, the time spent on site, age group of people entering the site etc., for radiological reasons.

l) Critical group: The group formed by the members of the public who are irradiated from a defined radiation source or sources and have a potential to incur hypothetically maximum exposure.

m) Criticality: Criticality which is defined in the "Regulation on Nuclear Definitions" issued in the official gazette dated 09/09/1991 and numbered 20986.

n) Spent nuclear fuel: Irradiated nuclear fuel removed from a nuclear reactor, and is no longer usable in its present form.

o) Applicant: Real or legal person founding radioactive waste facility.

ö) Authority: Turkish Atomic Energy Authority.

p) Bore hole disposal: Final storage of radioactive wastes in bore hole opened by drilling device.

r) Treatment: Activities involving methods such as ion exchange, sedimentation, filtration and concentration with the aim of changing the waste composition. reducing waste volume and removal of radionuclides from the waste.

s) Nuclear Material: Source materials and special fissile materials.

ş) Nuclear Facility: Any facility where consideration must be given, as determined by the Authority, to nuclear safety and security, where nuclear materials are produced, processed, used, kept, reprocessed, stored and disposed of.

t) Intermediate depth disposal facility: Radioactive waste facility located at least 30, at most a few hundred metres below surface for waste disposal.

u) Pretreatment: Preparatory activities for treatment such as collection, segregation, chemical adjustment and decontamination applied to radioactive wastes.

ü) Special fissile material: Plutonium-239; Uranium which is enriched with Uranium-233; 235 or 233 isotopes or any material including any one or more of these.

v) Radiation facility: Specifically designed places for radiation applications determined by the Authority.

y) Radiation applications: Any activity making use of radiation sources excluding the exceptions cited in "Regulation on Radiation Safety" issued in the official gazette dated 24/03/2000 and numbered 23999.

z) Radioactive waste: Nuclear and radioactive materials as well as structures, systems, components, materials become radioactive or contaminated with radioactive materials having activity levels above clearance levels and with no intention of reuse.

aa) Radioactive waste acceptance criteria: Criteria for acceptance of radioactive wastes to radioactive waste facility and determined by the authorized person, regarding radionuclide types for waste package or waste form, their activity concentration or total activity.

bb) Radioactive waste package: The product of conditioning, that includes the waste form, container and internal barrier.

cc) Radioactive waste facilities: Radioactive waste processing, storage and disposal facilities.

çç) Radioactive waste management: All technical and administrative activities regarding collection, processing, onsite transport, storage and disposal of radioactive wastes.

dd) Radioactive material: Materials that include isotope or isotopes emitting radiation by decay of nuclei without any external influence.

ee) Radiolysis: Change in chemical composition of materials induced by ionizing radiation.

ff) Site: Area where facility owner has an authority, surrounded by physical barriers and where only controlled access is allowable.

gg) Removal of site from regulatory control: Decision of the Authority within the framework of conditions set by the Authority stating that no regulatory control is needed for a particular site.

ğğ) Orphan source: A sealed radioactive source which is not under regulatory control either because it has been abandoned, stolen, lost or transferred without proper notification, or has never been within Authority records for different reasons.

hh) Clearance: Removal of radioactive substances or wastes which arise from practices or activities that require notification or authorization, from any further regulatory control due to their activity under certain limits or decrease their activity to those limits.

ıı) Clearance limits: Levels of activity concentration and surface contamination which are determined to be the limit value of radioactive substances or wastes to be removed from regulatory control.

ii) Facility: Nuclear facilities, radiation facilities and radioactive waste facilities.

jj) Plant conditions: All different conditions of a facility from normal operation to severe accidents.

kk) Conditioning: Operations which include turning radwastes into a form suitable for transport, storage and disposal, packaging them and, if necessary, providing an overpack.

ll) Near surface disposal facility: radioactive facilities for disposal of radioactive wastes that are at most 30 meters below surface.

mm) Reprocessing: Process or operation, the purpose of which is to extract radioactive isotopes from spent fuel for further use.

nn) Authorised person: Person authorised by the Authority to carry out an activity that needs authorization

oo) Surface disposal facility: Radioactive waste facility constructed on surface for the purpose of radioactive waste disposal.

SECTION TWO

Requirements and Principles of Radioactive Waste Management

Responsibility

ARTICLE 5- (1) Including the cost, management of radioactive wastes which are produced during the use of nuclear energy and ionising radiation sources is under the responsibility of the person carrying out this activity.

(2) For the activities which are not within the scope of use of nuclear energy and ionising radiation sources but may generate radioactive wastes, management of radioactive waste including its cost is under the responsibility of the person carrying out this activity.

Protection of workers, public and the environment

ARTICLE 6- (1) Adequate precautions shall be taken so that the effects of radioactive wastes, to personnel, public and the environment are not above allowable limits and that no unnecessary burden is given to future generations.

(2) In the management of radioactive wastes, all measures shall be taken for the potential affects on future generations not to exceed those on the current generation.

(3) Radiactive waste exceeding the level of exemptions and clearance cited in the 21st article of this regulation can not be released into the environment

(4) Management of secondary wastes which are generated during radioactive waste management steps are also subject to the provisions of this regulation.

(5) Radioactive wastes which are generated as a result of activities carried out outside the boundaries of the Republic of Turkey cannot be transported inside the boundaries for processing, storage or disposal purposes.

Control of radioactive waste generation

ARTICLE 7- (1) All measures shall be taken by the authorized person to keep radioactive waste generation as low as reasonable achievable in terms of volume and activity.

Transboundary impacts

ARTICLE 8- (1) Potantial effects of wastes on people and environment outside the borders of Turkey shall also be taken into account in radioactive waste management.

Interdependencies among all steps in radioactie waste management

ARTICLE 9- (1) Interaction between different but interrelated steps shall be taken into consideration in radioactive waste management. During planning activities for any step such as waste characterisation, processing, and transport, effects of other waste management steps on personnel, public and environment are also taken into consideration as practical as possible.

(2) Tasks, authorization and responsibilities are clearly defined for each step.

Criticality and radioactive decay heat

ARTICLE 10- (1) All necessary measures shall be taken by the authorized person to prevent criticality accidents in all activities concerning fissile materials in activities and facilites concerning radioactive waste management

(2) Necessary measures taking into account radioactive decay heat shall be taken by the authorized person in activities and facilities concerning radioactive waste management

Defence in depth

ARTICLE 11- (1) Defence in depth strategy shall be applied by the authorized person in all activities and facilities regarding radioactive waste management. As required by this strategy, measures shall be taken, which are sequence of applications that are hyerarchically designed, nested and independent from one another in order to maintain effectiveness of barriers between wastes and the personnel, public and the environment; to prevent incidents occuring in operation from developing into accidents; and to mitigate the consequences of accidents that had happened.

Radiation protection

ARTICLE 12- (1) In the activities concerning radioactive waste management, principles of radiation protection for the protection of individuals, public and environment shall be applied by authorized person as identified by the 7th article of "Radiation Safety Regulation".

Security

ARTICLE 13- (1) Security of nuclear and radioactive materials shall be ensured by the authorised person in activities and facilities concerned with radioactive waste management.

Management system

ARTICLE 14- (1) The authorised person for radioactive waste facility establishes and applies management systems covering all activities concerning radioactive waste management for all phases of the facility from siting to decommissioning or closure, and removal of site from regulatory control.

Safety management

ARTICLE 15- (1) The authorised person for the radioactive waste facility should carry out all activities for which authorisation is given within a management mechanism, conditions of authorization, responsibilities, and communication means of which are clearly set out with highest priority on matters concerning waste safety.

Safety culture

ARTICLE 16- (1) In radioactive waste facilities, giving the highest priority to matters concerning waste safety should be considered as a major principle for the top management of the authorized person. When establishing policies and administrative structures, this safety culture principle should be adopted as the main basis and it should be ensured that the personnel adopt this principle.

Human factor

ARTICLE 17- (1) Human factors shall be taken into consideration in all activities that may affect safety of radioactive waste facilities, and systems shall be established by the authorized person to ease the burden of operation personnel and to reduce occurrence of human errors to minimum level.

Transparency

ARTICLE 18- (1) On radioactive waste management, all public and stakeholders shall be informed in an effective manner.

SECTION THREE

Radioactive Waste Management Steps

Characterization of radioactive wastes

ARTICLE 19- (1) In order to ease the transition from one step of radioactive waste management to another, as a first step; physical, biological and radiological properties of the wastes shall be identified by the generator of the radioactive waste.

Classification of radioactive wastes

ARTICLE 20- (1) Based on radioactivity levels and half life of the radionuclides, radioactive wastes are classified as very short lived, very low level, low and intermediate level and high level wastes.

(2) In the steps carried out in radioactive waste management, waste class should be taken into consideration.

Clearance and exemption

ARTICLE 21- (1) Wastes the activity levels of which are below the exemption levels set out in the "Radiation Safety Regulation" are exempted from regulatory control.

(2) Clearance levels, procedures and principles for radioactive materials and wastes which are products of activities related to nuclear installations are arranged by “Regulation on Clearance in Nuclear Facilities and Removal of Site from Regulatory Control”.

Very short lived radioactive wastes

ARTICLE 22- (1) Radioactive wastes are classified as very short lived when their activities are above exemption levels and when their activities become less than clearance levels and thus appropriate for clearance after a storage period of a few years at most.

Very low level radioactive wastes

ARTICLE 23- (1) Radioactive wastes are classified as very low level when; their activities are above exemption levels; when they are not classified as very short lived wastes and when they have activity concentrations below approximately a hundred times of the clearance limits.

(2) Disposal of very low level radioactive wastes might be carried out in surface disposal facilities.

Low and intermediate level radioactive wastes

ARTICLE 24- (1) Radioactive wastes are classified as low and intermediate level if their activity concentrations exceed those of very low level radioactive wastes and if they are not classified as high level radioactive wastes.

(2) After conditioning, low and intermediate level radioactive wastes with alpha emitting radionuclide concentration of which are below 400 Bq/g for the average of whole package and below 4000 Bq/g for an individual waste package might be disposed of in near surface disposal facilities.

(3) After conditioning, low and intermediate level radioactive wastes with alpha emitting radionuclides concentration of which are above the limits cited in the second paragraph shall only be disposed of in intermediate-depth or deep disposal facilities.

(4) Packages of low and intermediate level radioactive wastes shall be stored in secure structures that are physically safe and resistant to environmental corrosion. Storage containers of low and intermediate level wastes are additionally shielded when necessary.

High level radioactive wastes

ARTICLE 25- (1) Spent fuels accepted by the Authority as radioactive waste, radioactive wastes which are products of reprocessing and may include fission products and actinides, and other radioactive wastes with comparable activity levels with those above are classified as high level radioactive wastes.

(2) High level radioactive wastes shall only be disposed of in deep disposal facilities.

(3) High level radioactive wastes and spent nuclear fuels shall be stored with adequate measures taken against criticality and decay heat removal until they are transferred to disposal or reprocessing facilities.

Processing

ARTICLE 26- (1) During pretreatment, radionuclide content, radioactive decay heat, physical condition, biological properties, chemical reactivity, radioactivity and contamination level of radioactive wastes shall be taken into account. Radioactive wastes shall be collected in the places where they are produced, by separating them based on the treatment they will be subject to as well as all their properties.

(2) Systems used in treatment shall be regularly checked to maintain their functionality and if necessary changed or replaced. Treatment shall be carried out so that the radioactive waste transferred to the next step in radioactive waste management is as low as possible in volume.

(3) During conditioning, radionuclide contents of radioactive wastes, criticality, radioactive decay heat, contamination level, corrosive material content, gas generation and physical properties shall be

taken into account. After conditioning, radioactive waste packages' integrity shall be maintained by protection against internal and external factors.

Transport

ARTICLE 27- (1) Except for transportation on facility site where public motorways and railways are not present, the processes regarding transportation of radioactive wastes as well as waste packages used in transportation shall be carried out in accordance with "Regulation on Safe Transportation of Radioactive Materials" issued in the official gazette dated 08.07.2005 and numbered 25869 and other legislation on this subject.

(2) The person authorised with operation or decommissioning of the facility shall develop quality management, radiation protection and on-site emergency procedures for on-site transportation and take all necessary measures by taking into account all possible radiation exposure pathways.

Storage

ARTICLE 28- (1) For safe storage of radioactive wastes, isolation of wastes from the environment shall be ensured with the use of multiple barrier approach.

(2) In the storage step, radioisotope content and half lives, activity concentrations and physical, chemical and biological properties of radioactive wastes to be stored shall be taken into consideration. Radioactive wastes should be stored by taking into account the planned storage time. Radioactive waste packages planned to be stored must be physically and chemically stable. All necessary measures should be taken to prevent lifetime loss and degradation of material of radioactive waste containers.

(3) Storage shall be carried out in a way to allow for testing, inspection, monitoring and examination of radioactive waste packages.

(4) Storage can be applied in predisposal radioactive waste management steps and between these steps.

(5) For spent nuclear fuel storage, provisions of "Regulation on Special Principles for Safety of Nuclear Fuel Cycle Installations" issued in the official gazette dated 30.07.2010 and numbered 27657 are valid.

Disposal

ARTICLE 29-(1) Disposal of radioactive wastes should be carried out to ensure that its potential effects to personnel, public and the environment are kept within allowable levels for a particular period of time determined by the Authority and that to provide passive isolation of the wastes from the environment.

(2) Only conditioned radioactive wastes can be disposed of in near surface, intermediate depth and deep disposal facilities.

(3) Long term safety of disposal facilities should be ensured with a suitable geological structure, engineering design features, adequate content and form of radioactive waste and procedures and controls for operation, closure and post closure phases of the facility.

(4) Small volumes of low and intermediate level radioactive wastes can be disposed of in borehole disposal facilities. In borehole disposal, the depth of the package that is nearest to the surface determines the type of the disposal facility. High level radioactive wastes cannot be disposed of in borehole disposal facilities.

Disposal or mining wastes

ARTICLE 30- (1) Radioactive wastes which arise from mining of nuclear raw materials and radioactive wastes of other ores which produce radioactive wastes should be disposed of in surface disposal facilities on the mining site under the responsibility of the authorized person for mining activity. Mining wastes the activity concentrations of which do not allow disposal to surface disposal facilities are disposed of in an appropriate disposal facility in accordance with provisions of this regulation.

SECTION FOUR

Release of Gaseous and Liquid Radioactive Wastes to the Environment

Disposal of radioactive gaseous and liquid wastes

ARTICLE 31- (1) Radioactive gaseous and liquids which do not exceed the limits determined by the authorized person are released to the environment.

(2) In order to make gaseous and liquid wastes suitable for release to the environment, processing step mentioned in the 26th article is followed when necessary.

(3) Release to the environment of radioactive wastes occurred from the use of radioisotopes those have half life less than 100 days and radioactive materials with C-14 and H-3 contents in areas such as medicine, industry and research and of radioactive wastes not produced by nuclear fuel cycle is carried out in accordance with "the Regulation on Wastes From the Use of Radioactive Materials "issued in the official gazette dated 02.09.2004 and numbered 25572.

(4) Liquid radioactive materials those will be released to the sewer system shall be soluble and dispersible in the water.

Dose constraints

ARTICLE 32- (1) Within the context of optimisation principle of radiation protection described in the 7th article of "Radiation Safety Regulation", dose constraints for the public are determined for each facility site by the Authority.

(2) Dose constraints for personnel should be determined, monitored and inspected by the authorised person.

(3) Dose constraints shall be taken into account in the design of the facility.

Release to the environment limits

ARTICLE 33- (1) Release limits shall be determined by the authorised person for gaseous and liquid wastes separately, based on optimisation of radiation protection as well as dose limits which are determined by the Authority for the public on the bases of plant conditions. Release limits in nuclear facilities should be presented to the Authority in the authorisation application for construction and operation. In the authorisation phase sufficiency of these limits are evaluated by the Authority. Final values are considered within the scope of operating limits and conditions of the plant.

(2) Release limits should be defined as yearly limit values related with activities of each radionuclide or radionuclide group. In addition to yearly limits, shorter term limit values can also be identified.

(3) When determining release limits, control techniques specified within the scope of optimisation of radiation protection as well as all plant operation conditions and potential changes in operation should be taken into account.

(4) Limits should be reviewed by the authorised person in 3 years for a newly commissioned facility, and at least once in 5 years in later stages of the facility and, if need be, the limits are updated.

(5) Activity of gases and liquids to be released to the environment in operation conditions of facility cannot exceed release limits to the environment.

Exceedance of the release limits

ARTICLE 34- (1) Within the scope of unanticipated occurrences in the facility, when a situation arises that necessitates exceeding of release limits to the environment, details of the situation and reasons for the release should be presented to the Authority by the authorised person and it must be shown by the authorised person that maximum effective doses received by critical groups are lower than the dose limits for public given in the "Radiation Safety Regulation". Release can be proceeded after affirmation by the Authority.

(2) Within the scope of unanticipated occurrences in the facility, when limits are exceeded due to an unplanned release, the authorised person notifies the Authority, investigates the reason for the release and takes necessary precautions.

Critical group doses

ARTICLE 35- (1) Before commissioning phase, properties and activities of radioactive gases and liquids planned to be released to the environment due to operation of the facility, potential release points and paths, total yearly waste amount, release methods and timing and irradiation paths for the public due to released radionuclides shall be identified by the authorized person. Due to planned releases, radiation doses received by critical groups should be calculated as maximum yearly doses that may be received in the last year of the operation of the facility by taking in to account the accumulation of radionuclides in the environment.

(2) Critical group doses should be calculated separately for each age group.

(3) Dose values that may be received by certain critical groups selected from the public can not exceed dose limits defined by the Authority.

(4) Information on releases and critical group doses should be presented to the Authority during application for the construction licence.

(5) Information on releases and critical group doses should be reported to the Authority during operation of the facility in regular intervals the length of which is determined by the Authority. At the operation stage critical group doses shall be determined related to reporting period and cumulatively.

Monitoring of radioactive gaseous and liquids and of the environment

ARTICLE 36- (1) Release of wastes to the environment shall be monitored by the authorised person to check whether releases of radioactive gases and liquids from the facility to the environment are in compliance with release limits or not.

(2) Environmental monitoring programme shall be applied in the facilities which yearly maximum doses received by critical groups exceed 10 μSv in the operation conditions. The authorised person is obliged to ensure; monitoring and recording of dose rates of the environment continuously; and monitoring and recording of activity in air, water, soil and various food samples in regular intervals.

SECTION FIVE

General Principles in Radioactive Waste Facilities

Authorisation

ARTICLE 37- (1) Activities concerning radioactive waste facilities are subject to authorisation.

(2) A radioactive waste facility is subject to authorisation as nuclear facility if wastes come from nuclear reactors and nuclear fuel cycle facilities or wastes contain nuclear materials; it is subject to authorisation as radiation facility if wastes only come from radiation applications and radiation facilities.

(3) Decommissioning or closure of radioactive waste facilities and removal of site of the facilities from regulatory control are subject to authorisation.

Responsibilities

ARTICLE 38- (1) In radioactive waste facilities, the authorised person is responsible for complying with goals and principles regarding waste safety and taking all measures in the processes related to safely commissioning of the facility, operation, decommissioning and closure and removal of site from the regulatory control.

(2) Activities and responsibilities of other persons, institutions and organisations including the Authority cannot reduce or remove the same responsibilities of the authorised person in any way.

(3) Under which conditions the responsibilities of the authorised person end is defined within the scope of the authorisation given by the Authority.

(4) Suspension or cancellation of the authority cannot remove the responsibilities of the authorised person.

Main obligations of the authorised person

ARTICLE 39- (1) Main responsibilities of the person authorised by the Authority to carry out activities related with radioactive waste facilities are as follows:

- a) to carry out the activity, with priority given to radioactive waste safety, in compliance with regulations within the terms and conditions set out by the Authority,
- b) to carry out the activity within a quality management system,
- c) to make periodic safety assessments regarding activities for which authorisation is given,
- ç) to collaborate with the Authority when the authorised activity is inspected by the Authority,
- d) to provide all data and documents demanded by the Authority on matters related with the activity for which authorisation is given,
- e) keeping and reporting of records, during the authorised activity, that are defined in the regulation,
- f) notification to the Authority of incidents that may occur during activities for which authorisation is given,
- g) to make necessary arrangements to prevent or mitigate the effects to personnel, public and the environment, concerning incidents that may occur in the facility,

(2) In addition to these provisions, additional provisions may be defined by the Authority regarding the authorisation given to the radioactive waste facility.

(3) Bankruptcy or resignation or similar actions of the authorised person do not remove these responsibilities.

Graded approach

ARTICLE 40- (1) Facilities and activities regarding radioactive waste management shall be treated, inspected and evaluated in a level commensurate with the extent of potential danger to personnel, public and the environment that this facility or activities may pose.

(2) Persons applying for authorisation shall prepare their documents along with the application in enough detail proportional to the extent of potential risks of the activity.

Demonstration and verification of safety

ARTICLE 41- (1) It must be shown with the documents prepared by using analyses, reports and programmes by the authorised person that the radioactive waste facility meets safety objectives before construction with its design, during construction with its built status, in the decommissioning and closure processes, and in both normal operation and accident conditions.

(2) After commissioning, in light of operation experience and new information on safety, these documents shall be renewed in intervals the length of which is determined by the Authority. During operation, it should be verified by using monitoring, inspection and tests that the condition and operation of the radioactive waste facility is in compliance with operating limits and conditions and meets the safety objectives.

SECTION SIX

General Safety Principles in Radioactive Waste Facilities

Site

ARTICLE 42- (1) The site on which the radioactive waste facility is to be built shall be determined by the Applicant of radioactive waste facility taking into account potential interaction between the facility and the environment as well as applicability of emergency plans. In the

assessment of these issues, the entire lifetime of the facility shall be taken into consideration and monitoring and if necessary re-assessment shall be carried out in order to check that the conditions regarding these issues remain acceptable in terms of safety.

(2) The site of the facility shall be assessed in terms of compatibility with transportation of radioactive wastes to the site.

(3) It must be shown that the site where a disposal facility is planned to be built has natural barriers.

Design

ARTICLE 43- (1) Radioactive waste facilities shall be designed such that radiation protection of personnel, public and the environment is provided during operating and accident conditions and that the facility is safely be decommissioned and closed.

(2) The facility shall be designed taking into account; total radioactive and nuclear material inventory of wastes to be stored, processed or disposed of; as well as potential radiological and non-radiological hazards.

(3) Structures, systems and components shall be designed taking into consideration the environmental factors and facility lifetime and in a way to prevent interaction between materials and the environment that may pose a risk to the facility.

(4) Structures, systems and components shall be designed to facilitate maintenance, repair, inspection and tests.

(5) Structures, systems and components shall be designed in compliance with the related regulations, codes and standards by classifying them according to their functions and their importance for safety. It shall be ensured in the design phase that, structures, systems and components important for safety are not harmed during operating conditions. Safety systems are designed to prevent accidents and to mitigate accident consequences.

Design of processing and storage facilities

ARTICLE 44- (1) In the design of the facility, systems such as ventilation, monitoring and fire protection shall be included. Measures against effects of radiolysis as well as shielding and leaktightness shall be taken into consideration in the design.

(2) Radioactive waste storage facilities shall be designed taking into account storage period of waste as well as possible increase in storage demand in the future or in emergency situations.

(3) In the design of the facility where high level radioactive wastes shall be stored and/or processed, systems that can monitor radioactive wastes and keep them under control under operating and accident conditions, are included. These facilities shall be designed such that cooling is provided with engineering systems and passive cooling systems (e.g. natural convection) and in case of loss of the cooling function the stored wastes are not harmed.

Design of disposal facilities

ARTICLE 45- (1) Disposal facilities shall be designed such that the potential effects of radioactive waste on personnel, public and environment remain within the levels determined by the Authority for a time interval that is defined by the Authority.

(2) Multiple barriers, which are planned to function during operation and post- closure, shall be included in the design of the facility to confine radionuclides and isolate them from the environment.

(3) Barriers, by means of their safety functions, shall be selected and designed to be physically and chemically different and complementary to one another such that post closure safety of the facility is ensured.

(4) The facility shall be designed such that active safety measures, such as control, maintenance and monitoring activities, are not needed after closure and that passive safety measures including limitations on site use and barriers are sufficient to ensure safety.

Construction

ARTICLE 46- (1) It should be demonstrated that main safety requirements are met in the design before the start of construction of the radioactive waste facility.

(2) It should be ensured that the facility is constructed according to its design by a construction organisation whose obligations, authorities and responsibilities are clearly defined.

(3) All structures, systems and components shall be constructed using proved and accepted technical methods and procedures, and at the quality in compliance with their safety classifications.

(4) During construction, if changes regarding safety are needed in the design of the facility, permission shall be taken from the Authority within the framework of procedures defined by the Authority.

Commissioning

ARTICLE 47- (1) Before commissioning, it must be demonstrated, within the scope of a particular programme, that the facility is constructed in compliance with design objectives by verification with tests showing that systems, structures and components carry out their intended functions. Commissioning programme shall include testing of all operation procedures applicability of which can be demonstrated at this stage.

(2) Before commissioning, an operating organisation shall be established. Operating personnel shall be provided with specific trainings for the facility during commissioning. Commissioning tests shall be carried out with the participation of personnel planned to be tasked with operation of the facility.

Operation

ARTICLE 48- (1) Operating limits and conditions outlining safe operation in all operational conditions of radioactive waste facility, and including radioactive waste acceptance criteria shall be defined by the authorised person. All necessary measures shall be taken to ensure that the facility is operated within operating limits and conditions. For any change in operating limits and conditions, permission is needed from the Authority in accordance with the related procedures.

(2) The facility shall be operated by sufficient number of qualified personnel of the operating organisation who have been adequately trained.

(3) All plans, programmes and procedures prepared by the authorised person for operation of the facility are put into practice after they are approved by the Authority.

(4) Special attention shall be given to inspections, tests and maintenance of systems, structures and components in the facility so that systems, structures and components continue to meet the design requirements.

(5) Changes in the facility shall be evaluated in terms of safety before putting them into practice and for all changes that may affect safety and security permissions are needed from the Authority in accordance with procedures determined by the Authority.

(6) An emergency plan shall be kept in the facility to apply in possible accident situations in the facility and drills shall be carried out in regular intervals to ensure applicability of the plan. Emergency plan shall be reviewed and updated in accordance with gained expertise.

Decommissioning

ARTICLE 49- (1) Persons authorised by the Authority to operate radioactive waste processing and storage facilities are obliged to decommission the facility. A decommissioning programme shall be developed and put into practice, which ensures to meet safety objectives for decommissioning activities.

Closure

ARTICLE 50- (1) Persons authorised with operation of disposal facilities are obliged to carry out closure of the facility. A closure programme shall be established and put into practice by the authorised person, ensuring provision of safety objectives for closure activities. In the closure programme, measures to be taken after closure and the duration of these measures shall be included.

(2) Until closure of the facility and removal from the regulatory control, all measures shall be taken to provide radiation protection of personnel, public and the environment.

(3) In the process up to closure and then removal from regulatory control, safety of the facility shall be ensured by the authorised person by taking active and passive safety precautions.

Removal of site from the regulatory control

ARTICLE 51- (1) Activities concerning sites of radioactive facilities and facilities themselves are subject to regulatory control by the Authority from the first authorisation given to the site to removal from regulatory control. The authorised person is responsible for removal of site from the regulatory control.

(2) Sites of disposal facilities are removed from regulatory control after post closure safety measures are taken and only for limited use of site.

(3) Procedures and principles of removal of site from the regulatory control are arranged by the Authority.

(4) After removal of site from the regulatory control, responsibilities of the authorised person terminate.

SECTION SEVEN

Radioactive Waste Management in Nuclear and Radiation Facilities

Radioactive waste management in nuclear facilities and responsibilities

ARTICLE 52- (1) Management of spent nuclear fuels and radioactive wastes which are products of activities in nuclear facilities are under the responsibility of person authorised to that facility. Bankruptcy or resignation or similar actions of the authorised person do not remove these responsibilities.

(2) The person authorised to operation of nuclear facility is responsible for defraying the costs of on-site management and off site transportation, storage, disposal and post-closure monitoring, if necessary, of spent nuclear fuels and radioactive wastes which are products of activities in the facilities.

(3) A radioactive waste management programme shall be established and put into practice the scope and content of which is defined in related regulations.

(4) Spent nuclear fuels are temporarily stored in storage facilities constructed onsite before being transferred to off site. Then, the authorised person may transfer these nuclear spent fuels; to an off site spent fuel storage facility or to a radioactive waste facility and may also opt for reprocessing and/or disposal or sending them to another country.

Radioactive Waste Management and responsibilities in radiation applications and radiation facilities

ARTICLE 53- (1) As related to management of radioactive wastes which are products of activities related with radiation applications and radiation facilities, the matters related with radioactive wastes

cited in the first, second and third paragraphs of the 52th article are under the responsibility of the person authorised to radiation applications and radiation facilities.

Termination of responsibilities

ARTICLE 54- (1) Responsibilities of the person authorised with an activity related with nuclear facilities or radiation applications and radiation facilities, regarding radioactive waste management, end just after realization of any condition given below and approval of this condition by the Authority on the basis of documents submitted to Authority.

- a) wastes are transferred to another country with no intention of retaking them, or
- b) radioactive wastes that are under exemption and clearance limits are disposed of, or
- c) when radioactive wastes that are above exemption and clearance limits are assigned to a person authorised to operate a radioactive waste facility.

SECTION EIGHT

Inspections and Sanctions

Inspections

ARTICLE 55- (1) Activities and facilities related to radioactive waste management which are within the scope of this regulation are subject to inspections of the Authority.

Sanctions

ARTICLE 56- (1) Permissions given to real or legal persons are temporarily or permanently annulled if they do not conform to the provisions defined in the regulation or exceed limits of authority or violate related regulations.

(2) When necessary, the Authority can take steps to initialization of legal and/or administrative investigations.

SECTION NINE

Miscellaneous and Last Provisions

Existing radioactive waste facilities

ARTICLE 57- (1) Conformity to the provisions of this regulation is assessed by the authorised person or applicant of existing radioactive waste facilities which are in operation by the time this regulation enters into force and an action plan for full conformity is prepared and presented to the Authority. This plan is put to practice after confirmation by the Authority.

Entry into force

ARTICLE 58- (1) This regulation enters into force on the date it is issued in the official gazette.

Enforcement

ARTICLE 59- (1) The provisions of this regulation are enforced by the president of the Authority.