REPUBLIC OF ESTONIA
ENVIRONMENTAL BOARD

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

Estonian National Report

Fifth Review Meeting

Radiation Safety Department, Environmental Board
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Section A. Introduction

This Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was adopted on 29 September 1997 in Vienna diplomatic Conference. Estonia signed the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management on 5 January 2001. Estonian Parliament ratified the convention on 19 October 2005. Estonia deposited the instrument of accession to the joint Convention on 03 February 2006. The convention entered into force on 04 May 2006.

This is the fourth National Report from Estonia, which provides an update on previous reports under the terms of the Joint Convention. The comments, questions and remarks given to Estonia's last national report and Estonia's presentation given at the Fourth Review Meeting have incorporated. It also seeks to provide sufficient background where necessary to enable it to be read as a stand-alone document. The information contained in the report were gathered and updated as at 01 October 2014, unless stated otherwise.

The report is structured in conformity with the "Guidelines regarding the form and structure of national reports" (INFCIRC/604/Rev.3) adopted at the Second Extraordinary Meeting of the Contracting Parties, 12–13 May 2014, held in Vienna, Austria. The section concerning the safety of spent fuel management covering Articles 4-10 of the Joint Convention is not applicable to Estonia.

In Estonia radioactive wastes are arising from the use of radioactive sources in industry, medicine and to a small extent from the use in education and research as well as from decommissioning of facilities used for radiation practice. Estonia has 2 shut-down nuclear submarine reactors of the former Soviet Union in long term storage stage in Paldiski (Paldiski site). Spent fuel was sent back to Russia. There is also a facility for interim storage for the low and intermediate radioactive waste in Paldiski. Radioactive waste management facility, which was used during Soviet time, is situated in Tammiku and is currently under decommissioning. The uranium mining and milling facility in Sillamäe was operational in late 1940`s – early 1980`s. Tailings pond has been remediated and is under environmental monitoring.

Estonia is a member state of the European Union from 1st May 2004. Thus, the regulations of the Union are in force in Estonia. When necessary, the Estonian regulations have been modified to take into account the EU regulations.

The Radiation Act, main legal instrument in Estonia in field of radiation and nuclear safety, provides that the benefits arising from the use of radiation and practices involving exposure to radiation shall exceed the detriment it causes; that the practice shall be organized in such a way that the resulting exposure to radiation hazardous to health is kept as low as reasonably achievable and that no person's exposure shall exceed the maximum values prescribed in the Radiation Act. These general safety principles, included in the Radiation Act, apply to the management of radioactive waste, including those arising from decommissioning of a nuclear facility. In 2011 the requirements of the European Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations were brought into Estonian legislation, the Radiation Act. The Radiation Act was amended with relevant definitions, decision on principle, obligations of the licence holder of the nuclear installations and quality assurance requirements to

ensure nuclear safety in nuclear installations. However, if the Estonia decides to use nuclear energy, the relevant nuclear legislation is required. Based on discussion with European Commission in 2014, amendments of the Nuclear Safety Directive, should be transposed and implemented in a proportionate manner in accordance with national circumstances, i.e. taking into account the specificities of the only nuclear site (Paldiski site) in Estonia with no nuclear fuel left and being in the decommissioning stage. In other words, and unless Estonia decides to build new nuclear installations, the provisions of the directive are to be implemented (only) to the extent which is necessary to ensure the nuclear safety of the Paldiski site until its decommissioning is completed.

The report is prepared by the Environmental Board under the Ministry of the Environment, in co-operation with the radioactive waste management agency A.L.A.R.A. Ltd and the Ministry of the Environment.

Based on the evaluation, it is the understanding of the Estonian authorities that:

- the Estonian radiation and waste safety legislation fulfils the obligations of the Convention;
- the Estonian regulatory infrastructure is in compliance with the Convention obligations;
- the regulatory and licensing policies and the practical implementation of radioactive waste management comply with the Convention obligations;
- future challenges are foreseen to enhance safety, notably in the area of working out the policies; these are discussed in the report.

It is concluded in the report that Estonia meets all obligations of the Convention.

Section B. Policies and Practices

ARTICLE 32. REPORTING

1. *In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention. For each Contracting Party the report shall also address it`s:*
   - *i. spent fuel management policy;*
   - *ii. spent fuel management practices;*
   - *iii. radioactive waste management policy;*
   - *iv. radioactive waste management practices;*
   - *v. criteria used to define and categorize radioactive waste.*

The policy and practice for radioactive waste management is to collect, characterize, manage and store all Estonian radioactive waste under safe and secure conditions in dedicated storage facilities. Estonia does not have neither nuclear power plants, research reactors nor facilities for radioactive material production.

National Development Plan for Radiation Protection approved in 2008 by the Government provides priority areas, the radioactive waste management among others, for further development to achieve high-level radiation protection and safety, and to ensure optimized regulatory framework. The Plan sets goals for period 2008-2017 and to meet targets, action plan for radioactive waste management has elaborated and further improved. Under the Plan, the preparation of the National Programme on Management of Radioactive Waste started in 2009. In 2011, the Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste entered into force which sets the contents of national programme safe management of spent fuel and radioactive waste. EU Member States are obliged to notify to the Commission their national programmes by August 2015. According to this Directive, some improvements need to do the National Programme. These amendments are in a drafting stage and the programme will be available in 2015.

Radioactive waste management is regulated in the framework of the Radiation Act. According to the definition given in the Article 3 of the Radiation Act radioactive waste is any material or object which contains or is contaminated by radionuclides, the activity or specific activity of which exceeds the established clearance levels and for which no future use is foreseen. The definition includes also equipment, goods and materials that are contaminated by radioactive materials. Radioactive materials and radiation appliances containing radioactive material whose owner cannot be found shall also be regarded as radioactive waste.

Radioactive waste will be categorized by activity or specific activity, by half-life, by type of radiation and by heat generation as a result of radioactive decay. In conditioning and storing of radioactive waste their producer has to take into account, beside their type, also physical, chemical and biological properties of radioactive waste. Radioactive waste categorization is the following:

- exempt waste – includes radioactive waste arising from radiation practice the activity, specific activity or surface-specific activity of which are below the exemption levels,

(established by Regulation No. 8 of 9 February 2005, see Annex C);

- short-lived waste – includes radioactive waste, which contains radionuclides with half-life less than 100 days and which decay within less than 5 years below exemption level;
- low and intermediate activity short-lived waste – includes radioactive waste, which contains β- and γ-sources with half-life less than 30 years and a limited number of long-lived α-sources (no more than 4000 Bq/g for one waste package and no more than 400 Bq/g averaged for total waste package amount);
- low and intermediate activity long-lived waste – includes radioactive waste, which contains radionuclides with half-life higher than 30 years with the activity concentration higher than that for low and intermediate activity short-lived waste and which will generate less than 2 kW/m3 heat energy during radioactive decay;
- high level waste – includes radioactive waste, which generates more than 2 kW/m3 heat energy during radioactive decay.

According to the Radiation Act, the organization engaged in radiation practice is required to take any measures to render harmless radioactive wastes arising from its operation. Rendering radioactive waste harmless means any measure needed to treat, isolate or dispose of the waste, or to restrict its use so that it does not endanger human health or the environment. The state has the secondary responsibility in case when a producer of radioactive waste is incapable of fulfilling its management obligation. There are two options for the management of such radioactive waste - either to return the sealed source to the supplier/manufacturer or to deliver it to the waste management agency paying a waste management fee. The 2011 amendment to the Radiation Act gives to the regulatory body the right to demand financial guarantee from the applicant to ensure that the funds necessary for safe storage of the radioactive source or waste are immediately available.

Majority of waste generated by practices involving the use of unsealed sources have too low activity concentrations or amounts to justify their storage in the same way that is implemented, e.g., for the disused sealed sources. A common practice is that radionuclide laboratories store their short-lived radioactive waste at their premises until their activity/activity concentration decays below the approved discharge limit.

The information of radioactive waste management based on current practice and on National Development Plan for Radiation Protection is summarised in the matrix shown in Annex A.

Section C. Scope of Application

ARTICLE 3. SCOPE OF APPLICATION

1. *This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.*
2. *This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.*
3. *This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.*
4. *This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.*

As Contracting Party to the Joint Convention Estonia declares that:

- airborne and liquid discharges from radioactive waste management facilities are included in the scope of this Convention.
- waste that contains only naturally occurring radioactive materials is not radioactive waste for the purpose of the Convention.
- there is no radioactive waste from military of defence programmes
- there is no spent fuel and thus no reprocessing of it.

However, waste that contains only naturally occurring radioactive materials is managed identical to the radioactive waste described in this report, as this kind of waste is covered by the legislative and regulatory system mentioned in section E.

Section D. Inventories and Lists

ARTICLE 32. REPORTING

2. This report shall also include:

i. a list of the spent fuel management facilities subject to this Convention, their location, main purpose and essential features;

ii. an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain a description of the material and, if available, give information on its mass and its total activity;

iii. a list of the radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;

iv. an inventory of radioactive waste that is subject to this Convention that:

(a) is being held in storage at radioactive waste management and nuclear fuel cycle facilities;

(b) has been disposed of; or

(c) has resulted from past practices.

This inventory shall contain a description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;

v. a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.

There are no nuclear power plants, research reactors and facilities for radioactive material production in Estonia. However, there are radioactively contaminated facilities and considerable amounts of radioactive waste at few sites in Estonia resulting from the former USSR military and non-military nuclear activities up to 1991. These are: Paldiski, Sillamäe and Tammiku (Figure 1).

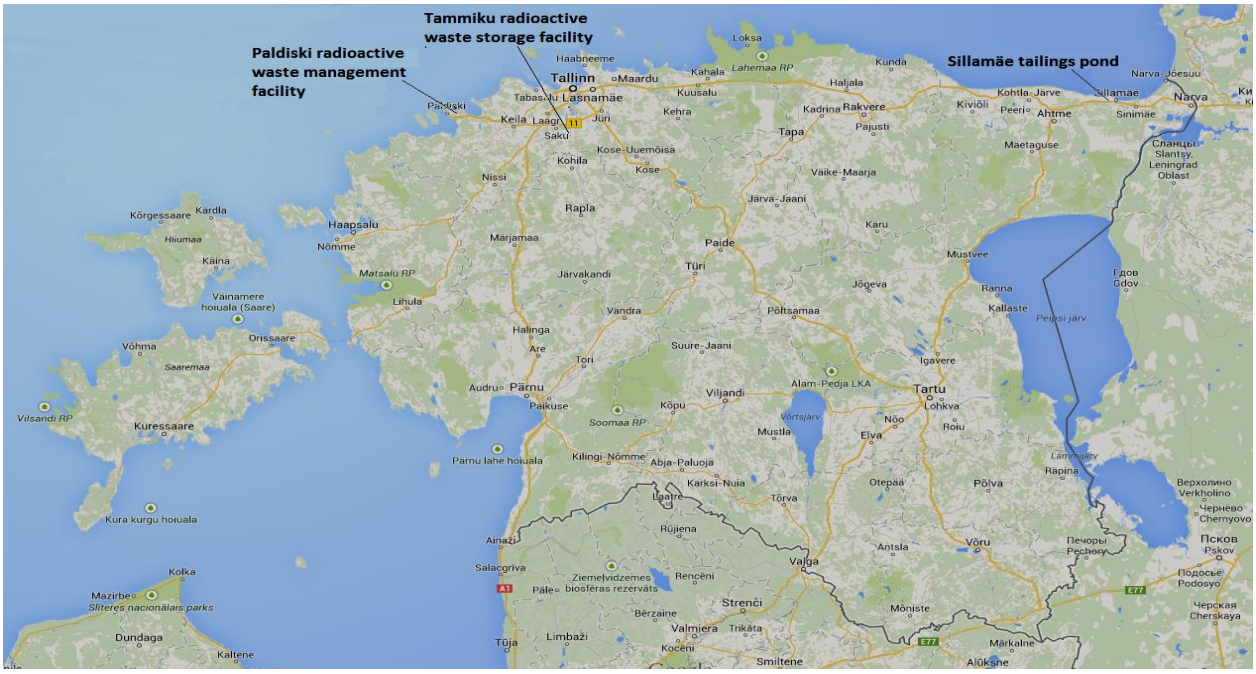

Figure 1 Radioactive waste sites in Estonia

Table 1 shows the overall information about radioactive waste sites in Estonia and an inventory of radioactive waste that is subject to this Convention.

Table 1. Information about radioactive waste sites in Estonia

Owner	Ministry of Economic Affairs and Communications
Location	Paldiski, 50 km West of Tallinn
Purpose	Interim radioactive waste storage facility
Inventory	Activity ca 900 TBq. This is the activity of the characterized waste which is about 50 % of overall waste volume, mainly spent sealed sources of Sr-90, Cs-137, Co-60 and Pu-Be neutron sources. The volume of the waste situated in interim storage and control area is about 920 m^3. Uncharacterized waste is mostly low level waste and their contribution to overall activity is small. See annex B, for more detailed information on inventory
Essential Features	Operational
Remarks	The interim storage is situated in Paldiski at the same site with 2 PWR reactor compartments, which are in the process of deferred decommissioning (listed as a nuclear facility in this report). The interim storage commissioned and in operation since the year 1997 and is intended to use for both decommissioning and institutional waste.

Owner	Ministry of Economic Affairs and Communications
Location	Tammiku, 12 km South of Tallinn
Purpose	Radioactive waste storage facility
Inventory	All the waste has been removed and transported into Paldiski interim storage facility (stored, conditioned). Decontamination of the remaining concrete structure is foreseen, the estimated volume of waste arising from it is ca 28 m^3 LLW (both long and short-lived radionuclides), with the weight of ca 50 tons.
Essential Features	Under decommissioning. All radioactive waste was removed from the site by September 2011. The final end of decommissioning is green field which requires decontamination of remaining storage structures, dismantling of them and removal of all building rubble.

Owner	Silmet Group
Location	Sillamäe, 184 km East of Tallinn
Purpose	Former uranium mining and milling facility
Inventory	1830 tons of U, 850 tons of Th and up to 3000-4000 TBq of their daughter products, including 226Ra
Essential Features	The tailings pond containing the above inventory is remediated

Radioactive waste management facilities

There are two radioactive waste management facilities subject to the Convention in Estonia: the Paldiski interim radioactive waste storage and the Tammiku radioactive waste storage facility, which are both under administration of the state-owned A.L.A.R.A. Ltd., responsible for radioactive waste management. A.L.A.R.A. Ltd. reports to the Ministry of Economic Affairs and Communications.

The interim storage is commissioned and in operation since the year 1997 and is intended to use for both decommissioning and institutional waste. The radiation practice licence for Paldiski site includes the following information and conditions:

1) The location where the radiation practice takes place and a description of the facility and premises, including maps with defined controlled and supervised areas;
2) The manners in which radioactive waste is managed, and the maximum quantities and management facilities for radioactive waste, including data of radioactive waste package and waste package acceptance criteria;
3) The maximum quantities of radioactive emissions, and means of releasing them into the environment;
4) Radiation safety requirements for transport of radioactive material;
5) The requirements for radiation safety and radiation monitoring arising from the given radiation practice and its specific character, including workplace monitoring programme as well as environmental monitoring programme.

Addition to this, licence includes conditions and monitoring programme for storage of the reactor compartments.

Tammiku was a RADON-type storage facility for institutional waste, commissioned in 1963. In 1996, it was temporarily closed and the storage vaults were covered with concrete slabs and soil layer. In 2008, A.L.A.R.A. Ltd started the decommissioning process, after approval of the Environmental Impact Assessment Report (EIA) by the Minister of the Environment in 2007. After analysis of several possible options, the following option was chosen: to retrieve all radioactive waste from Tammiku, to transport it to the Paldiski facility, to condition and to store it in the interim radioactive waste storage. Decommissioning has two stages – the first, retrieval and transportation of the waste, and the second, the decontamination and dismantling of the facility. For the first stage, the company obtained the corresponding radiation practice licence, which is valid until the end of 2011. By the end of September 2011 all waste has been retrieved and transferred to Paldiski.

At the same year the company applied for the radiation practice licence in order to continue with the second stage of decommissioning, which includes the radiological survey of the facility, the of decontamination and demolishing of concrete structures of the facility. All cavities have to be filled, so they will be even with the surface. In the end, the area will be converted into a green field area. The license for the second stage was obtained at the November 2012 and it valid for 5 years. The radiological survey carried out in 2013-2014 and, based on its results, the decontamination works are currently under preparation. The expected volume of LLW (contaminated building rubble) is 20 m3. The waste will be transported to the Paldiski interim storage facility. To release radioactive waste storage from under regulatory control the clearance conditions and clearance levels has to meet stated in Regulation No. 10 of 15 February 2005 "The Clearance Levels for Radioactive Substances and Materials Contaminated with Radioactive Substances Resulting from Radiation Practices, and the Requirements for Their Clearance, Recycling and Reuse," see Annex C. The site should remain under environmental surveillance according to the Estonian legislation.

Nuclear facilities under decommissioning

The former USSR nuclear submarine training centre, with 2 PWR reactor compartments (see table 2 for characteristics) at the Paldiski site is in the process of deferred decommissioning. In 1994, based on the Agreement between the Republic of Estonia and the Russian Federation, before the site was taken over by the Estonian authorities, the reactors were defuelled and the spent nuclear fuel was shipped to Russia. Currently, A.L.A.R.A. Ltd administrates the site.

Table 2. Characteristics of the reactors in Paldiski site

Description	**Unit 1**	**Unit 2**
Reactor type	PWR/BM-A	PWR/BM-4
Thermal power	70 MW	90 MW
Fuel enrichment	20%	20%
First criticality	April 1968	February 1983
Last criticality	January 1989	December 1989
Refuelling and maintenance	1980 - 1981	never
Operating time	~ 20,000 h	~ 5,300 h
Encasement (submarine hull segment) – diameter – length	 7.5 m ~ 50 m	 9,5 m ~ 50 m

Pre-feasibility study was carried out 1999-2001 by the TECHNICATOME/BNFL consortium to evaluate of management routes for the reactor compartments. During project data was collected and analysed, potential dismantling routes were drawn up and dismantling options assessed. Depending decommissioning strategy radioactive waste volume could be up to 2070 m3.

During the period 2005-2007, a number of activities have been undertaken on the site under the EU Phare project 632.03.01 "Safe long-term storage of Paldiski sarcophagi and related dismantling

activities". The main objective of the project has been to guarantee the safe storage of the reactor compartments for a period of at least 50 years. By that time, Estonia should have a specific radioactive waste disposal facility, which could accommodate waste arising from decommissioning of the reactor compartments. The storage of reactor compartments is covered with radiation practice licence for Paldiski site discussed earlier.

Related to the decommissioning of reactor compartments feasibility studies have been planned by A.L.A.R.A. Ltd for the period of 2015-2017. More information is given Section H.

Section E. Legislative and Regulatory System

ARTICLE 18. IMPLEMENTING MEASURES

Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention.

The necessary legislative, regulatory and other measures to fulfil the obligations of the Convention in terms of legislative, regulatory and administrative activities are described mainly in Articles 19 20 and detailed in the relevant Articles of this report.

The main legal instrument is the Radiation Act. The principles of radiation and nuclear safety as well as the responsibilities of the licence holder are provided by the Radiation Act. Article 2 of the Act specifies that no radiation practice should be started without a radiation practice licence. The Environmental Impact Assessment and Auditing Act states that the environmental impact shall be assessed upon application for or application for amendment and for development consent if the proposed activity which is the basis for application for or amendment of the development consent potentially results in significant environmental impact.

Article 6 of the Environmental Impact Assessment and Environmental Management System Act provides that practices concerning radioactive waste management and nuclear fuel cycle and the corresponding facilities are activities with significant environmental impact.

Activities with significant environmental impact include also:

1) construction, dismantling or decommissioning of a nuclear power station or other nuclear reactors, except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load;
2) production or enrichment of nuclear fuel, processing of irradiated nuclear fuel or handling of irradiated nuclear fuel or radioactive waste;
3) construction of installations for temporary storage or final disposal of irradiated nuclear fuel or radioactive waste.

Estonia is joined with the Convention on Environmental Impact Assessment in a Transboundary Context - the 'Espoo (EIA) Convention' - and it in force since 24 July 2001.

ARTICLE 19. LEGISLATIVE AND REGULATORY FRAMEWORK

1. Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.
2. This legislative and regulatory framework shall provide for:
i the establishment of applicable national safety requirements and regulations for radiation safety;
a system of licensing of spent fuel and radioactive waste management activities;
ii. a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;
iii. a system of appropriate institutional control, regulatory inspection and documentation and reporting;
iv. the enforcement of applicable regulations and of the terms of the licences;
v. a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management.
3. When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall take due account of the objectives of this Convention.

Estonian legislation has determined only the general requirements concerning nuclear facilities. The legislation for radioactive waste management is part of the overall Estonian legislation on radiation protection, which was established in 1997, when the first Radiation Act came into force. Since then, a new version of the Radiation Act came into force in 2004, to which several amendments and new regulations have been issued.

The relevant general regulation beside the Radiation Act is the Regulation of Minister of the Environment No 8 of 05 February 2005 (as amended in 2009) for the radioactive waste management, „The Classification of Radioactive waste, the Requirements for Registration, Management and Delivery of Radioactive Waste and the Acceptance Criteria for Radioactive Waste“ (see Annex C). It specifies the requirements for radioactive waste management and sets the following:

- Definitions
- Radioactive waste classification
- Requirements for radioactive waste pre-treatment and storage
- Requirements for radioactive waste treatment and conditioning
- Requirements for radioactive waste treatment storage in producer premises
- Requirements for interim storage facility of radioactive waste
- Requirements for safety assessment of interim storage facility and final disposal of radioactive waste
- Activities and events covered in radiation safety assessment
- Physical protection of radioactive waste
- Requirements for radioactive waste package
- Acceptance criteria for waste package
- Delivery of radioactive waste
- Registration, accountancy and reporting of radioactive waste

The current regulations apply to the possession, sale, transit, transport, import, export, use for commercial, industrial, medical, scientific or other purposes, recycling and re-use of equipment or substances capable of emitting ionizing radiation. They also apply to the treatment, handling,

storage, elimination and disposal of radioactive substances or waste and to any other activity involving a risk arising from ionizing radiation.

The licensing system for practices is described in Chapters 3-4 of the Radiation Act and general requirements for managing of radioactive waste and radioactive emissions are described in Chapter 7 of the Radiation Act.

According to the last amendment in 2011 to the Radiation Act (based on Council Directive 2009/71/Euratom), Article 18 (2^1) states that the licence to operate a nuclear installation can be applied only after the Estonian Parliament has made a decision to take a nuclear installation into use.

The use of radiation (if not exempted by the law), including radioactive waste management, requires a radiation practice licence, which can be granted by the Environmental Board (national regulatory body, see Article 20) upon application. During processing of the radiation practice licence application the Environmental Board verifies the presented data and the situation on-site inter alia. A licence can be subjected to additional conditions needed to ensure safety and is valid up to 5 years, with no opportunity to extend its period of validity.

The verification of safety is carried out in the form of safety reviews and safety assessments as well as in course of periodic inspections. As a precondition for granting a radiation practice licence, the Radiation Act requires that the applicant shall present a valid proof on the safe management of any radioactive waste, which may be generated. Radiation safety assessments given by the Environmental Board are final. However, in the course of assessment preparation the Environmental Board may ask advice and consult with qualified radiation experts.

According to the Article 14 of the Radiation Act, all radiation practices shall be performed only by licence holders. Article 18 (1) lists the documents, which the applicant for a radiation practice licence shall present, while Article 18 (3) defines the practices of low, moderate and high risk. All practices involving radioactive waste management and nuclear fuel cycle and the corresponding facilities, as well as practices using high-activity radioactive sources are considered as practices of high radiation risk (Article 18 (3^1)).

Article 19 establishes generic data and conditions common for all radiation practice licences and the additional ones, including public involvement (Articles 20 and 21) in case of radioactive waste management and nuclear fuel cycle related activities as well as work activities within which the presence of natural radioactive sources leads to a significant increase in the exposure which cannot be disregarded from the radiation protection point of view.

The Radiation Act (Article 22) states that the Environmental Board shall refuse to issue a radiation practice licence, if:

- the activity, for which the radiation practice licence is applied, involves or is likely to involve a risk to national or international security;
- the activity, for which the radiation practice licence is applied, does not conform to the requirements provided by legislation;
- false information is submitted in the application for the radiation practice licence;
- the applicant for the radiation practice licence does not employ with requisite professional training;

- the location of the radiation practice set out in the application or other conditions do not allow for compliance with radiation safety requirements.

According to the Radiation Act Article 4(1) the performance of activities related to radiation protection shall be organised by the Ministry of the Environment within the limits of its competence through the Environmental Inspectorate and Environmental Board. Radioactive waste management is subject to the authorization by the Environmental Board and the inspection of these practices and facilities is carried out by the Environmental Inspectorate (see Article 20 for details).

The specialists of the Environmental Board have access to all premises during the licensing process. The Environmental Inspectorate has the same direct access to all premises, buildings, etc., for inspection purposes. The Environmental Board and the Environmental Inspectorate prepare jointly a yearly inspection plan, which foresees the inspection of the above mentioned facilities once every year. The fulfilling of the condition and obligations of holder of the radiation practice licence are assessed. Responsibility of Environmental Inspectorate concerning radiation safety is to implement measures provided by law for the prevention of illegal activities and implementation of mandatory environmental protection measures. The inspector from Environmental Inspectorate has the right to apply enforcement measures (precepts, suspension or termination of illegal activities) if violation is found.

A list of relevant Acts and Regulations in force by 01 October 2014 is given in Annex C.

ARTICLE 20. REGULATORY BODY

1. *Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfill its assigned responsibilities.*
2. *Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.*

The Radiation Act and its administration belong to the responsibility of the Ministry of Environment, which as such, is independent from the Ministry of Economic Affairs and Communications. The latter elaborates, manages and implements the state`s economic policy and economic development plans, in a number of fields. The Ministry of Economic Affairs and Communications administrates state owned radioactive waste facilities and its state owned company A.L.A.R.A. Ltd, which performs decommissioning of nuclear installations.

The Environmental Board is authorized to fulfil the obligation of the regulatory authority in the country. The other body, the Environmental Inspectorate, is provided an authorization to carry out regular inspections of the licensed practices. Both authorities have their own budget on the annual Fiscal Act.

The Environmental Board is a governmental authority operating within the area of governance of the Ministry of the Environment. Its task is to implement the state policies, to perform a supervisory function and to enforce powers of the state within the scope and as provided by law. The areas of activity include the protection and use of the state's environment and nature and the implementation of radiation safety policies, programs and activity plans. The Environmental Board was established on 1 February 2009 by uniting the environmental authority of the Ministry of the Environment, the National Centre for Environmental Protection and the Estonian Radiation Protection Centre. The Environmental Board is headed by a Director General who is appointed and dismissed by the Minister of the Environment. The Environmental Board has 10 departments and 6 regions (see Figure 2). The Environmental Board has 420 employees, 17 of them are working in the Radiation Safety Department (as of 01 October 2014). The Radiation Safety Department of the Environmental Board consists of two bureaus: radiation monitoring bureau and radiation protection bureau. Radiation Safety Department is administered by the Head of Department who may have advisers.

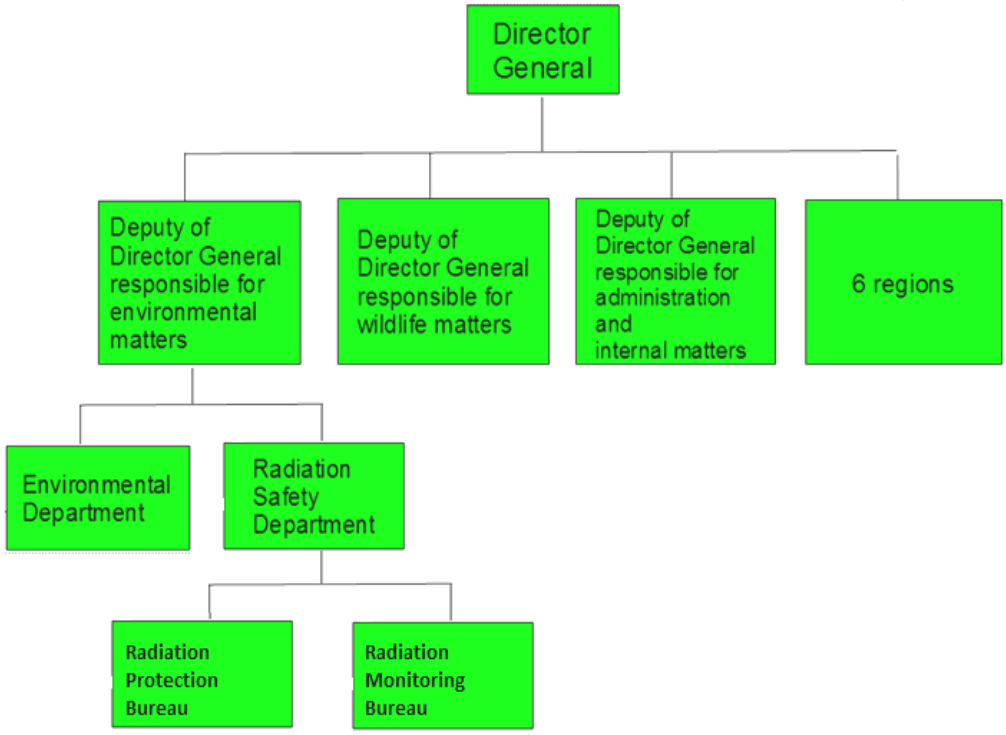

Figure 2. Structure of Environmental Board

The Environmental Board has the following duties in the field of radiation safety:

- to issue radiation practice licences as well as other environmental licences;
- to participate in the development and implementation of the radiation protection policy, development plans and programs;
- to perform administrative proceedings within the limits of its competence
- to prepare the radiation safety assessments for existing and applied radiation practices;
- to organize the assessment of population doses and doses for critical groups arising from radiation practices;
- to maintain the registries related to radiation safety;
- in cooperation with the Environmental Inspectorate to exercise regulatory supervision over the radiation practice licences;
- to organize the monitoring of radionuclides in the air, soil, water and food, radioactivity in the environment and to analyze the results;
- to perform laboratory analysis related to radiation safety;
- to secure functioning of the early-warning system pursuant to the provisions of legal acts and to the conditions established by international conventions and treaties and timely warning in the case of a radiation emergency;
- to serve as a contact point for EURATOM and IAEA;
- to serve as a national data centre (NDC) in the exchange of information in the framework of the CTBT agreement;
- to participate in international cooperation, to prepare and to participate in international projects in the field of radiation safety;

- to participate in the preparation of emergency situation management plans, in the testing of these plans and in the management of possible emergency cases;

The Environmental Inspectorate (see Figure 3) is also an administrative unit under the Ministry of Environment, which exercises supervision in all areas of environmental protection. It coordinates and executes supervision regarding the use of natural resources and the protection of the environment by applying the state´s coercive measures on the basis and to the extent specified by law.

The Environmental Inspectorate is an institution dealing with environmental violations and since September 1st, 2011 also carries out investigations in criminal cases.

The Environmental Inspectorate has the right to:

- implement measures provided by law for the prevention of illegal activities and implementation of mandatory environmental protection measures;
- suspend unlawful activities damaging or dangerous to the environment and also lawful activities related to the use of natural resources if such activities endanger the life, health or property of persons;
- organise the storage, sale and return to the lawful owner or destruction of natural products of undetermined ownership and of equipment and instruments used for procurement thereof;
- organise, in the cases prescribed by law, the liquidation of unauthorised construction works. The functions, rights and obligations of the Environmental Inspectorate are specified in the Environmental Supervision Act (see Annex C).

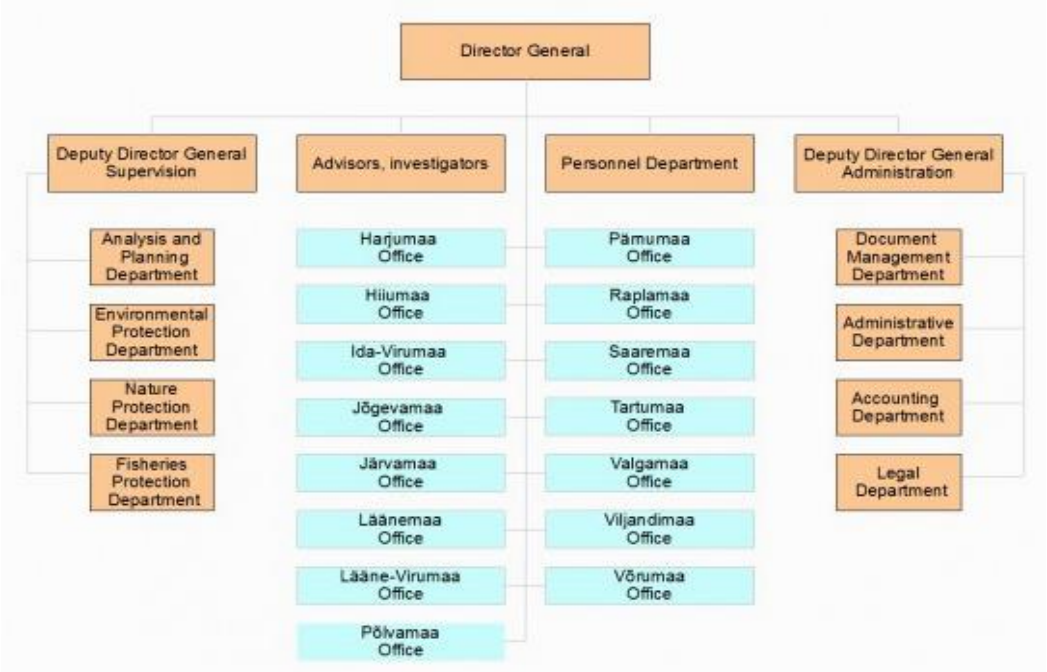

Figure 3. Structure of Environmental Inspectorate[1]

[1] http://www.kki.ee/eng/?part=html&id=6

Section F. Other General Safety Provisions

ARTICLE 21. RESPONSIBILITY OF THE LICENCE HOLDER

1. *Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.*
2. *If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.*

According to the Article 30 of the Radiation Act the holder of a radiation practice licence has the obligation to:

- be responsible for radiation safety and to guarantee the physical protection of radioactive sources in the licence holder's possession;
- prepare the rules necessary for performing radiation practices and instructing exposed workers;
- organize the treatment and conditioning of radioactive waste if such activity is necessary for modifying the properties of the radioactive waste prior to its release into the environment, and to arrange the interim or final disposal of the radioactive waste;
- take an annual inventory of the radioactive sources and submit the results of the inventory to the Environmental Board by 1 March of the following year;
- provide training and radiation safety instruction for exposed workers commensurate with the nature of their work and workplace conditions;
- organize the medical examination of exposed workers;
- upon a change of ownership of a radioactive source, provide the new owner with comprehensive information to ensure radiation safety;
- immediately inform the Environmental Board and the Alarm Centre of accidents which take place in the course of radiation practices and of exposure events involving doses exceeding the dose limits;
- alleviate the consequences of emergencies;
- ensure the regular control and calibration of measuring instruments used and be responsible for their fitness for use and appropriate use;
- ensure the monitoring of doses incurred by exposed workers and submission of the obtained information to the dose registry;
- guarantee that all building design documentation concerning facilities is reviewed, and that new radioactive sources to be used are approved beforehand by a qualified expert;
- render a radioactive source harmless after its use is terminated pursuant to the plan for rendering the radioactive source harmless submitted in the application for the licence;
- provide certification, at the request of competent authorities, of the legality of the possession of radioactive substances or radiation apparatuses containing radioactive substances;
- prepare an emergency plan if the person engages in high risk radiation practices and test the plan pursuant to the requirements and with the frequency established by legislation;
- improve the technologies, equipment and techniques used;
- develope and implement a quality system of radiation safety.

According to the amendment of the Radiation Act in 2011 (based on Council Directive 2009/71/Euratom), in addition, the licence holder of a nuclear installation has to:

- ensure implementation of nuclear safety measures and compliance with relevant requirements;
- ensure that the employees of the nuclear installation and sub-contractors follow the nuclear safety culture and the quality assurance system of radiation safety on their jobs;
- assess nuclear safety of the nuclear installation at least as often as it is set out in the conditions of the radiation practice licence.

To enhance radiation safety, the Radiation Act authorizes the Environmental Board to establish additional requirements to a radiation practice licence. The 2011 amendment to the Radiation Act gives the regulatory body, the right to demand financial guarantee from the applicant to ensure sufficient funds necessary for safe disposal of the radioactive source or waste.

It is the responsibility of the Environmental Board to verify that the licence holder fulfils the regulations. The licence holders are subject to inspections by the Environmental Inspectorate and in case of violation, their practices may suspend for a period until the requested corrective measures are applied.

Radiation Act provides that the responsible party shall manage the practice so that it meets all radiation safety requirements prescribed in the Act and it shall take all measures needed to render radioactive waste arising from its operation harmless.
The legislative, regulatory and administrative measures in the Estonian regulatory system are adequate for the situation in Estonia and in compliance with the obligations of the Convention as discussed in this report.

ARTICLE 22. HUMAN AND FINANCIAL RESOURCES

Each Contracting Party shall take the appropriate steps to ensure that:

i. qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;

ii. adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;

iii. financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility.

The radiation protection and safety related specified education is very limited in Estonia. The recruitment is based on the requirement of educational background and minimum educational level. Sciences (physics, chemistry), medical physics and engineering (including environmental technology) are preferred to work in the regulatory authorities and in other institutions related with ensuring of radiation safety. In addition, information of professional experience should be provided in order to evaluate ability to fulfil particular responsibilities. As Estonia has very few institutions dealing with radiation protection and safety, the requirement to have experience in radiation protection and safety is not often fulfilled. Estonia uses an opportunity to train staff under the IAEA Technical co-operation programme since 1992. In order to give a basic knowledge to new employees the Radiation Safety Department has carried out two one-week lasting training courses.

Specialists from the radiation protection bureau upon request train the inspectors from Environmental Inspectorate as well. However, the problem with finding qualified staff remains an issue for regulatory authorities as well as other institutions like users of radiation sources and radioactive waste management company. Therefore, the participation in the IAEA's Technical co-operation programme is continuously relevant, with regard to develop competences.

According to the Radiation Act, the main responsibility to have a qualified staff is the responsibility of to the radiation practice owner. Concerning licensing of a radioactive waste management agency, a copy of qualification certificate, copy of document certifying in-service training in radiation safety is requested as well as requirements on qualifications of and educational programs for staff members working with radioactive sources must be submitted together with the other documents needed. Additionally, chapter 4 of the Radiation Act prescribes that the responsible party is required to ensure that in safety related matters of radiation practices the expertise is available, taking into account the nature and the risks characteristic to the practice.

The lack of radiation protection and safety related specified education is outlined in the National Development Plan for Radiation Protection for 2008-2017. Activities like establishment of new curricula as well as additional training programmes for the universities are proposed. The responsibility to enforce these activities is in the Ministry of the Education. However, the activities are postponed.

The financial arrangements are adequate for ensuring the long-term safety of the Paldiski and Tammiku facilities as these are state properties, and as such, the financial situation is and will be secure also in the future until all the facilities are fully decommissioned. The owner of the Paldiski site is Ministry of Economy and Communication. Each year the agreement will be made between Ministry and radioactive waste management organization A.L.A.R.A. Ltd for manage and decontaminate the Paldiski site. The agreement will be financed of resources of state budget. Thus the financial capacity to maintain and if necessary improve the safety of facilities for radioactive waste management in accordance with the regulatory requirements is ensured. The availability of adequate financial resources is assured also in the future.

ARTICLE 23. QUALITY ASSURANCE

Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.

Principal obligation of holders of radiation practice licences include being responsible for radiation safety and guarantee the physical protection of the radioactive sources in the holder`s possession, also developing and implementing a radiation safety quality system. Article 18 (1) of the Radiation Act prescribes that an application for a practice licence shall include the description of the radiation safety quality system. Article 32 of the Act provides that the radiation quality system shall include the following:

- planned and systematic activity aimed at ensuring radiation safety;
- an analysis of the duties of workers and the requirements for the skills needed to operate the radioactive sources;
- a system for controlling the compliance with the radiation safety requirements;
- a description of the procedures for the supply and use of materials and of the procedures for supervision over radiation safety and controlling the functioning of safety systems.

This programme should describe the ways of assuring that all quality related activities will be performed in the properly controlled conditions, i.e. by properly qualified personnel using appropriate tools, equipment, methods and technological processes and under suitable environmental conditions, so that the required quality is attained and may be verified by inspection or test. Review and assessment of the relevant radiation quality system is carried out by the regulatory body at all stages of the licensing process, i.e. prior to and during the construction, operation, closure and decommissioning of radioactive waste storages and repositories. If necessary, suitable conditions and requirements will be included in the licence. The regulatory body, through the requirements concerning the preparation and implementation of the radiation quality system, obliges the applicant/licence holder to plan, perform, verify and document all their activities in an organized and systematic way. An effective radiation quality system, established and implemented by the licence holder, allows the regulatory body to obtain satisfactory confidence in the quality of facility's equipment and in the quality of all performed activities. The regulatory body confirms that the licence holder has established and implemented and effective radiation quality system by audits, document reviews and inspections of work.

In Environmental Board the majority of radioactivity analysis activities are accredited and the Quality Manual for the Laboratory of Radiation Safety Department of the Environmental Board is approved by the Estonian Accreditation Centre. Additionally, the Environmental Board applied EMAS (the European Union Eco-Management and Audit Scheme) certificate in 2013.

The quality assurance at Paldiski is guaranteed by implementing the set of regulations covering radiological protection of workers, physical safety, waste acceptance criteria, environmental monitoring and written work procedures. The quality management system and the environmental management system of A.L.A.R.A. Ltd. are certified accordingly to the ISO 9000 and ISO 14000.

ARTICLE 24. OPERATIONAL RADIATION PROTECTION

1. Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility:

- *i. the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;*
- *ii. no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection; and*
- *iii. measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment*

2. Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:

- *i. to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and*
- *ii. so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.*

iii. 3. Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented control the release and mitigate its effects.

Before starting a radiation practice, the radiation licence applicant shall present the estimation of radioactive waste and discharges, as well as emergency plan and actions/measures to prevent unplanned and uncontrolled releases of radioactive materials into the environment, and procedures taken in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs.

During the operating lifetime, all radioactive waste management practices and the management facility itself shall implement the requirements of the Radiation Act and the regulations issued on its basis. The requirements on the ALARA principle and on the dose limitation are explicitly included in the Radiation Act.

The national system for radiation dose control for workers is based on the regulation of the Government No 193 of 17 May 2004: Effective Dose and Equivalent Dose Limits for the Lens of the Eyes, Skin and Extremities for Exposed Workers and Members of the Public. As prescribed in the abovementioned regulation limits of the effective dose are the following:

- for exposed workers 100 mSv in 5 years, but not more than 50 mSv in one year;
- members of the public 1 mSv in one year.

Workplaces shall be divided into the following areas depending on the type of premises and building in which the radioactive source is located, the category of the radioactive source, and the radiation risk category: controlled areas or supervised areas.

Depending on the need, monitoring of controlled and supervised areas shall include monitoring of dose rates; monitoring of levels of radioactive contaminants in the air and on surfaces together with

testing the properties of the radioactive waste, and determining their physical and chemical status. The holder of a radiation practice licence shall register the results of monitoring and shall preserve the results during the entire period of operation in the area of radiation practices. The requirements for the premises, where radiation sources are located, the marking of such premises and the radiation sources, and the rules for the performance of radiation practices are established by the Regulation No. 113 of 7 September 2004 (see Annex C).

The Environmental Board has carried out monitoring around radioactive waste management facilities. It covers fish, seaweed and seawater. Sampling is generally conducted on an annual basis. The results are published in annual environmental radiation monitoring reports. For the period from 2012 to 2014 the activity concentrations of Cs-137 vary: in the seawater from 23 Bq/m^3 to 25 Bq/m^3, for fish from 3.3 to 4.3 Bq/kg, for seaweed up to 16.9 Bq/kg and for berries and mushrooms from up to 176 Bq/kg. There have been no measurements for bottom sea sediments. Because the decontamination and decommissioning can cause the discharges to the environment and the most probabilistic pathways include water, the water samples from wells (both the Tammiku and the Paldiski site) are sampled on a quarterly basis. At the Tammiku site the maximum result for tritium was 247 Bq/l in 2012. All other measurement results were under 10 Bq/l.

A.L.A.R.A. Ltd has two radiation practice licences: one for radioactive waste management in the Paldiski site and the second for decommissioning of the Tammiku radioactive waste storage. The content overview of the radiation practice licences are given in Section D.

A.L.A.R.A. Ltd carries out on-site environmental monitoring which includes monitoring of upper groundwater aquifer (borehole) on a quarterly basis, grass on a semi-annual basis and soil on an annual basis at the Paldiski site and semi-annually at the Tammiku site.

The reported activity concentrations for the period from 2012 to 2013 for the Paldiski site are the following:

1) upper groundwater aquifer: tritium - bdl (less than 3 Bq/l), Sr-90 from 0.027 to 0.067 Bq/l, Cs-137 as well as for Co-60 less than 0.2 Bq/l;
2) grass: Cs-137 from 0 to 145 Bq/kg, Sr-90 up to 2.3 Bq/kg;
3) soil: Cs-137 from 1.9 to 9.3 Bq/kg, Sr-90 max 0,56 Bq/kg;

The monitoring programme also includes quarterly sampling of off-site sewage water at coastal outfall. Activity concentrations are stabilized, for Cs- 137 it is under 0.3 Bq/l, for H-3 under 3 Bq/l and for Sr-90 it is less than 0.053 Bq/l.

The reported activity concentrations for the period from 2012 to 2013 for the Tammiku site are the following:

1) upper groundwater aquifer: maximum result for tritium was 204 Bq/l in 2012, all other results were less than 7 Bq/l, Sr-90 less than 0.03 Bq/l, Cs-137 as well as Co-60 less than 0.2 Bq/l;
2) grass: Cs-137 from less than 0.9 to 12.6 Bq/kg, Sr-90 from 0.74 to 28 Bq/kg;
3) soil: Cs-137 from 0.7 to 21.3 Bq/kg, Sr-90 from less than 0.7 to 1.3 Bq/kg; Ra-226 from 34 to 42 Bq/kg

The Tammiku site does not have a sewage system.

ARTICLE 25. EMERGENCY PREPAREDNESS

1. Each Contracting Party shall ensure that before and during operation of a spent fuel or radioactive waste management facility there are appropriate on-site and, if necessary, off-site emergency plans. Such emergency plans should be tested at an appropriate frequency.

2. Each Contracting Party shall take the appropriate steps for the preparation and testing of emergency plans for its territory insofar as it is likely to be affected in the event of a radiological emergency at a spent fuel or radioactive waste management facility in the vicinity of its territory.

The national legal framework for emergency preparedness, including nuclear and radiological emergency, is based on the Emergency Act passed 15 June 2009, to which several amendments are issued. The Act provides the legal bases for crisis management, including analyzing of risks, preparing for emergencies and responding to emergencies as well as ensuring the continuous operation of vital services. This Act also regulates the declaration of, the response to and the termination of state of emergency situations and the use of the Defence Forces and the National Defence League in responding to emergencies, performing rescue operations and ensuring security. A number of regulations specifying important requirements of the Act have been passed by the Government and by the Minister of the Interior. In Estonia emergency preparedness system is coordinated by and under the responsibility of the Minister of Interior.

Obligation to keep the public informed about the emergency and a pending risk of an emergency is provided by the Radiation Act and the Emergency Act. Details about the quality and contents of the information is provided in the corresponding regulation. Arrangements are in place to inform the public of the emergency, its consequences and of any countermeasures that are to be implemented to reduce doses to the population. National Development Plan for Radiation Protection 2008-2017 includes also the requirement to conduct joint emergency exercises at least once per year. Emergency Act requires to prepare several emergency plans, including plan to response a radiological emergency and elaborates on the content of these plans. Emergency Act also sees to conduct complex crisis management exercises at least once in four years to test these plans.

26 September – 5 October 2011, IAEA carried out an Emergency Preparedness Review EPREV mission in Estonia, to conduct, in accordance with article III of the IAEA Statute, a peer review of correspondence of Estonia's emergency preparedness and response arrangements to the relevant IAEA standards. The review focused on the ability of the relevant Estonian organizations to respond to a radiological incident or emergency, and was based on an assessment of existing response provisions and capabilities. In summary, the review team was in opinion that Estonia has established an operational emergency preparedness and response capability based on an integrated all hazard approach including radiological emergencies. The EPREV team recognized dedication of the Estonian counterparts to improve and further harmonize the emergency preparedness and response system with the international standards (see Annex D).

A.L.A.R.A. Ltd has the emergency preparedness plan, which describes actions in the case of a radiation emergency situation in the radioactive waste management facility. Radioactive waste management practice is defined according to the legislation as a high-risk radiation practice. Conditions for testing and updating of emergency response plan are set in radiation practice licence

of A.L.A.R.A. Ltd, issued in 2011. The company shall test the plan once per year and update it regularly.

ARTICLE 26. DECOMMISSIONING

Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that:

i. qualified staff and adequate financial resources are available;
ii. the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;
iii. the provisions of Article 25 with respect to emergency preparedness are applied; and
iv. records of information important to decommissioning are kept.

A.L.A.R.A. Ltd., operator of both facilities under decommissioning (Tammiku Radioactive Waste Storage and Paldiski site) is state owned and operates under Ministry of Economic Affairs and Communications. The staff and financial arrangements of the A.L.A.R.A. Ltd. are adequate for the long-term safe storage of the reactor compartments at Paldiski and decommissioning and remediation of Tammiku radioactive waste depository.

The site operator A.L.A.R.A. Ltd. has two radiation practice licences issued pursuant to the Radiation Act. Current licence for Paldiski site is valid until March 2016 and for Tammiku site until November 2017. Tammiku licence covers clean up and dismantling process.

According to the licence of Tammiku radioactive waste depository, the walls, floors and ceilings of the facility are decontaminated in-situ, monitored for compliance with the clearance levels for building materials established in the Regulation No. 10 of 15 February 2005 (see Annex C). For unconditional clearance, in the case of compliance, cleared by the regulatory authority and demolished. The cleared building rubble will be transferred to the manager of conventional waste or to some building company. The contaminated building rubble packaged in containers and transported for its further management to Paldiski site.

It is the responsibility of licence holder to document and keep records of the relevant data received during decommissioning process. In case of decommissioning of the Tammiku radioactive waste storage, the licence holder has the obligation based on the licence conditions to provide the regulatory body following data for assessment: map of distribution of radioactive contamination, radiological characterization of the facility, results of radioactivity analysis, map of distribution of radioactive contamination after decontamination and environmental monitoring data during decommissioning process.

As sites under decommissioning are state properties, the financial situation is and will be secure, also in the future until all the installations are fully decommissioned.

The Radiation Act establishes the provisions of Article 24 of the Joint Convention with respect to operational radiation protection, discharges and unplanned and uncontrolled releases as well as the provisions of Article 25 with respect to emergency.

Section G. Safety of Spent Fuel Management

ARTICLE 4. GENERAL SAFETY REQUIREMENTS

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

- *i. ensure that criticality and removal of residual heat generated during spent fuel management are adequately addressed;*
- *ii. ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;*
- *iii. take into account interdependencies among the different steps in spent fuel management;*
- *iv. provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;*
- *v. take into account the biological, chemical and other hazards that may be associated with spent fuel management;*
- *vi. strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;*
- *vii. aim to avoid imposing undue burdens on future generations.*

ARTICLE 5. EXISTING FACILITIES

Each Contracting Party shall take the appropriate steps to review the safety of any spent fuel management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility.

ARTICLE 6. SITING OF PROPOSED FACILITIES

1. *Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility:*
   - *i. to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;*
   - *ii. to evaluate the likely safety impact of such a facility on individuals, society and the environment;*
   - *iii. to make information on the safety of such a facility available to members of the public*
   - *iv. to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*
1. *In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.*

ARTICLE 7. DESIGN AND CONSTRUCTION OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

- *i. the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;*
- *ii. at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;*

iii. the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.

ARTICLE 8. ASSESSMENT OF SAFETY OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

i. before construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

ii. before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

ARTICLE 9. OPERATION OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

i. the licence to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

ii. operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;

iii. operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;

iv. engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;

v. incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

vi. programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

vii. decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.

ARTICLE 10. DISPOSAL OF SPENT FUEL

If, pursuant to its own legislative and regulatory framework, a Contracting Party has designated spent fuel for disposal, the disposal of such spent fuel shall be in accordance with the obligations of Chapter 3 relating to the disposal of radioactive waste.

There is no overall policy for the spent fuel management in Estonia, as spent fuel from the former U.S.S.R Paldiski Nuclear Submarine Training facility was under the Russian jurisdiction and according to the Estonian-Russian agreement was transported to Russia in 1994.

Section H. Safety of Radioactive Waste Management

ARTICLE 11. GENERAL SAFETY REQUIREMENTS

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

i. ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;

ii. ensure that the generation of radioactive waste is kept to the minimum practicable;

iii. take into account interdependencies among the different steps in radioactive waste management;

iv. provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

v. take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

vi. strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

vii. aim to avoid imposing undue burdens on future generations.

Estonian legislation together with the National Development Plan for Radiation Protection (especially the section, which covers radioactive waste management) provide the policy, principles and also strategy for radioactive waste management.

The Estonian legislation in radiation protection has been developed based on internationally recognized standards and criteria. Requirements on operational limits and conditions for handling, storing and transport of radioactive material during radioactive waste management are adequately addressed.

General requirements for managing of radioactive waste and radioactive emissions are described under Article 58. The holder of a radiation practice licence shall guarantee the safe management of radioactive waste and radioactive emissions created in the course of radiation practices and shall make sure that:

- radioactive waste is managed such that the estimated harmful effect on future generations of such practices will not exceed the effect permitted by the Act or legislation established on the basis thereof;
- the activity and quantities of created radioactive waste and emissions are as low as possible;
- the biological, chemical and other risks are taken into account, considering the reciprocal effect that different stages in radioactive waste production have on the management thereof;
- radioactive waste is delivered to radioactive waste management facilities not later than within five years after their production.

Additionally, the licence holder must have clear working procedures in order to avoid unnecessary transfer of objects and materials in the controlled areas. Radioactive waste management is covered also by the requirements of the Environmental Impact Assessment and Environmental Management

System Act. This means that all possible hazards are considered in the Environmental Impact Assessment report.

ARTICLE 12. EXISTING FACILITIES AND PAST PRACTICES

Each Contracting Party shall in due course take the appropriate steps to review:

i. the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;

ii. the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.

The waste management facilities at Paldiski and Tammiku existed before the Radiation Act was put into force in 1997. Consequently, this law did not regulate the original design of the installations and the initial constructions. Radioactive waste management facility at Paldiski has been continuously modernised with a view to safety enhancement. Tammiku storage facility is under decommissioning and all radioactive waste related to the decommissioning activities as well as all other radioactive waste produced in Estonia is stored under safe and secure conditions at Paldiski site. The radiation practice in both sites are licensed and safety assessments have been performed.

The Estonian authorities have carried out regular inspections and reviewed and enforced safety procedures in connection with licence applications.

ARTICLE 13. SITING OF PROPOSED FACILITIES

1. Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:

i. to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;

ii. to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;

iii. to make information on the safety of such a facility available to members of the public;

iv. to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 11.

ARTICLE 14. DESIGN AND CONSTRUCTION OF FACILITIES

Each *Contracting Party shall take the appropriate steps to ensure that:*

i. the design and construction of a radioactive waste management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

ii. at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;

iii. at the design stage, technical provisions for the closure of a disposal facility are prepared;

iv. the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.

As a result of different actions it is foreseen to have a final depository for disposal of low and intermediate radioactive waste by 2040-2050. Radioactive waste disposal issues are specified in the National Development Plan for Radiation Protection (2008-2017). It foresees during next couple of years the feasibility studies for site selection for final disposal as well as for the decommissioning of reactor compartments at the Paldiski site.

As a first stage of these studies, it is planned to conduct of preliminary technical investigations and gathering of necessary data, which will enable to plan further decisions and activities, as well as to start EIA process. This preliminary study will cover the following topics:

1) overview of the applicable international and national requirements;
2) different strategies of the reactor sections decommissioning;
3) final disposal options, taking into account both existing (including reactor compartments in Paldiski) and possible future radioactive wastes;
4) cost calculations for decommissioning of Paldiski reactor compartments, handling and final disposal of radioactive waste;
5) communication strategy.

In order to achieve the best results, the feasibility studies are foreseen to be done in co-operation with neighbouring countries. Based on the outcomes of the feasibility study the suitable options for final disposal will be chosen.

This initial process will make sure that all necessary steps are taken to implement fundamental principles and requirements for a disposal facility in compliance with national and international obligations and recommendations. Prior to siting, construction and commissioning of the Estonian disposal facility, the project should be subject to the environmental impact assessment according to the Estonian legislation which implements the European Council Directive 85/337/EEC and 97/11/EC. In addition, prior to the commissioning of a disposal facility the European Commission will be provided with general data relating to the disposal project making it possible for the Commission to assess whether the implementation of the project is liable to result in a radioactive contamination of the water, soil or airspace of another Member State as called for under the Article 37 of the Euratom Treaty.

ARTICLE 15. ASSESSMENT OF SAFETY OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

i. before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

ii. in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;

iii. before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

Safety assessment is a part of the licensing process (see Article 19) and is periodically reviewed and updated.

Article 6 of the Environmental Impact Assessment and Environmental Management System provides that practices concerning radioactive waste management and nuclear fuel cycle and the corresponding facilities are activities with significant environmental impact.

Activities with significant environmental impact include also:

- construction, dismantling or decommissioning of a nuclear power station or other nuclear reactors, except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load;
- production or enrichment of nuclear fuel, processing of irradiated nuclear fuels or handling of irradiated nuclear fuels or radioactive waste;
- construction of installations for temporary storage or final disposal of irradiated nuclear fuels or radioactive waste.

Environmental impact assessment (EIA) procedure consist of program and report stages. EIA report consists of the following components:

- alternatives and defining parameters of the project;
- links to other project and plans;
- environmental impacts of construction and operation;
- impacts of transportation and traffic;
- impacts on land use, cultural heritage, landscape, building and structures;
- impacts on the soil, bedrock and groundwater;
- impacts on air quality;
- noise and vibration impacts;
- impacts on vegetation, animals and objects of protection;
- impact on people and attitudes toward the disposal of radioactive wastes;
- impacts on social structure and regional economy;
- transboundary impacts.

Decommissioning process for Tammiku radioactive waste storage was covered with environmental impact assessment. Based on the results of feasibility study the environmental impact assessment procedure (EIA) will follow upon radiation practice application for decommissioning of reactor compartments. The results of the studies will be used in decision making as well as planning process of final disposal.

ARTICLE 16. OPERATION OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

i. *the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;*
ii. *operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary;*
iii. *operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;*
iv. *engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;*
v. *procedures for characterization and segregation of radioactive waste are applied;*
vi. *incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;*
vii. *programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;*
viii. *decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;*
ix. *plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.*

As previously mentioned the waste management facilities were constructed before the Radiation Act entered into force in 1997. Later modifications have been subject to approval by the national regulatory body and regulated through operational limits and conditions in accordance with the Act and requirements stipulated in the licences.

The operator of the radioactive waste management facility, A.L.A.R.A. Ltd., is a state-owned company operating under the Ministry of Economic Affairs and Communications. Its staff and financial arrangements correspond to the safe management of radioactive waste. The A.L.A.R.A. Ltd. has a radiation practice licence issued pursuant to the Radiation Act for radioactive waste management.

To obtain or amend the licence for radioactive waste management the provisions concerning open proceedings apply to the procedure for issue or amendment of radiation practice licence. The process of an application can proceed up to 90 days. However, there is a possibility to prolong the licensing procedure up to three months if the radiation practice licence is applied for a technically complex radiation practice.

The requirements for licence application is established with the Regulation No. 41 of 29 April 2004 „The Time Limits for Proceedings to Issue, Amend or Revoke Radiation Practice Licences, the Specific Requirements for and Format of Applications for Radiation Practice Licences, and the

Format of Radiation Practice Licences". Addition to this the requirements of Regulation No. 8 of 9 February 2005 „The Classification of Radioactive Waste, the Requirements for Registration, Management and Delivery of Radioactive Waste and the Acceptance Criteria for Radioactive Waste" has to followed. Among other documents, the applicant is required also to present the quality management of radiation safety.

According to Action Plan of Development Plan radioactive waste management company has to elaborate waste clearance procedures, to work out measurement methods for characterization of decommissioning waste.

ARTICLE 17. INSTITUTIONAL MEASURES AFTER CLOSURE

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

i. records of the location, design and inventory of that facility required by the regulatory body are preserved;

ii. active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and

iii. if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.

According to Article 63 of the Radiation Act, after the termination of operations of a radioactive waste management facility, the Environmental Board shall:

- preserve the documents concerning the location and design of the radioactive waste management facility, and the inventory of radioactive waste for an indefinite time;
- organise radiation monitoring and check the restriction of access as necessary;
- organise intervention, if based on monitoring results or upon inspection, release of radioactive materials into the environment is established.

Section I. Transboundary movement

ARTICLE 27.TRANSBOUNDARY MOVEMENT

1. Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments.

In so doing:

i. a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;

ii. transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;

iii. a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;

iv. a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;

v. a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.

1. A Contracting Party shall not licence the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.

2. Nothing in this Convention prejudices or affects:

i. the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;

ii. rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;

iii. the right of a Contracting Party to export its spent fuel for reprocessing;

iv. rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.

The Government has issued the Regulation No. 243 of 8 July 2004 (as amended in 2009) on Procedure Specifications for Processing Documents of Import, Export and Transit of Radioactive Waste Based on Country of Origin and Destination (see Annex C). This Regulation implements all obligations under Article 27 (Transboundary movement) of the Convention. The regulation is the Estonian implementation of Council Directive 92/3/EURATOM of 3 February 1992 on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community.

Neither the Ministry of the Environment nor the Environmental Board has until now never received an application and consequently has never issued any licence for a transboundary movement of radioactive waste with Estonia as the country of origin or with Estonia as the country of destination. Since issuance of the above-mentioned regulation, there has also been no authorisation for transboundary movement of radioactive waste between EU-countries with Estonia as a country of transit.

Section J. Disused sealed Sources

ARTICLE 28. DISUSED SEALED SOURCES

1. Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner.

2. A Contracting Party shall allow for reentry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.

Radioactive sealed sources are mainly used in medicine, industry and research institutions. Minor quantities are also used in service agencies. The use of radioactive sources is covered by the Radiation Act and several regulations. These legal documents implement all obligations under Article 28 of the Convention ensuring that the possession and storage of disused sealed sources take place in a safe manner.

The Radiation Act requires that there is prior authorization for holding the source for all practices involving the use of radioactive sources. General conditions are laid down in the Radiation Act and regulations.

All premises where radioactive sources are employed are inspected regularly at least once in 5 years by the Environmental Inspectorate and by the Environmental Board during licencing. The source and licence database maintained by the Radiation Safety Department of the Environmental Board includes source-specific information on all sources in licence holders' possession. This information is updated continuously according to licence holders' notification and observations made during the licensing process and inspections. The main objective of an inspection is to validate that radioactive sources are used and stored safely and other conditions set in the radiation practice licence are followed. Any changes must be notified to the Environmental Board. In case of loss or theft of a source the licence holder shall notify immediately the Alarm Centre and the Environmental Board. Additionally, the holder of a radiation practice licence has the obligation to take an annual inventory of the radioactive sources and submit the results of the inventory to the Environmental Board by 01 March of the following year.

Each radiation practice licence applicant has to present with licence application a management plan for the end of use of the source. As stated in section F it is the responsibility of the licence holder to ensure that disused sealed sources are handled in a safe manner. Disused radioactive sources shall be returned to supplier, transferred to radioactive waste management company or transferred for reuse to another authorized holder. The first option is preferred. In Estonia neither manufacturing nor re-manufacturing of sealed sources takes place. For use of high-activity radioactive source the licence applicant shall present with licence application a copy of documents which proves returning sources to supplier after termination of use the sources.

The issuer of radiation practice licence may request from licence applicant the financial guarantees for safe management of disused sources. The financial guarantees are requested from private companies (mostly industry). The financial guarantees from public institutions (hospitals, research institutions) are not requested as they are financed by state budget. However, public institutions have to present copy of source supplier agreement to return sources if it exists and/or confirmation

of finances for the management of disused sources based on quotation from radioactive waste management company.

If the origin of waste is unknown, like in case of orphan sources, the State has the obligation to render the radioactive waste harmless. In such case, the licence holder – if identified later – shall compensate the State for the costs incurred in such action.

Fixed monitors for vehicles and railway traffic have been installed to all major crossing points at the Estonian-Russian border and at the Tallinn Airport. In all crossing points the custom officers are equipped with portable monitors. Customs and Tax Board together with Security Police Board have procedures of conduct for cases when radioactive sources are discovered at the border. In general, if undocumented material is discovered: suspicious parcel is isolated and Security Police is notified. Common practice is, when radioactive material package arrives or when there is a suspicion on the radioactive material package, the Customs and Tax Board contacts the Environmental Board to find out information about the receiver of radioactive material package based on the custom documents.

Disused sealed sources can also enter into the recycling stream of scrap metal, therefore biggest scrap metal companies have installed fixed monitors at the gates of their installations. In exceptional cases the Environmental Board should be notified.

Section K. Planned Activities to Improve Safety

According to the Radiation Safety Development Plan 2008-2017, one of the most important strategic objective is suppression of hazards associated with radioactive waste and its management. Some important activities for the next years are establishment of a state system for management and storage of radioactive waste containing natural radionuclides, also finalize decommissioning of radioactive waste storage facility that does not comply with the requirements. In co-operation with A.L.A.R.A. Ltd, the Ministry of the Environment shall prepare preliminary research concerning further management of radioactive waste (dismantling of the reactor compartments and final disposal facility) and submit these to the EU, also regarding the construction of a final disposal facility.

The National Programme on Management of Radioactive Waste is in a drafting stage and will be available in 2015. It will be in accordance with the Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste and will cover following topics: overall principles and objectives of the national policy and existing legislation, including legal and regulatory framework, responsibilities for the implementation of the National Programme and organisations involved; waste classification system; inventory of all radioactive waste and estimation of future arising, including supporting assumptions for future estimations; existing and planned radioactive waste management, including disposal and post closure; economical and financial issues.

During period 2015-2017 is planned to conduct a feasibility studies on decommissioning of reactor compartments. Based on the outcome of studies the environmental impact assessment procedure (EIA) will follow upon radiation practice application for decommissioning of reactor compartments. The results of the studies will be used in decision making as well as planning process for final disposal.

Additionally, Estonia has agreed bring into force the laws, regulations and administrative provisions necessary to comply with European Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation by 6 February 2018.

The main issues need to be resolved is decommissioning of reactor compartments in connection with final disposal and management of the waste/residue containing naturally occurring radioactive material.

Annex A. Matrix of current practice of radioactive waste management

Type of Liability	Long Term Management Policy	Funding Liability	Current Practice/Facilities	Planned Facilities
Spent Fuel	N/A	-	-	-
Nuclear Fuel Cycle Waste	No NFCW generated	-	-	
Non-power Waste	Central Interim Storage, then Disposal	Waste producers, Government	Central Interim Storage	Disposal facility
Decommissioning	-	Government	Decommissioning of the Paldiski site; Decommissioning of the Tammiku RWS	Disposal facility
Disused Sealed Sources	Return to supplier/Disposal	Owners, Government	Return to supplier/ Central Interim Storage	Disposal facility

Annex B. Inventory of radioactive waste in interim storage

Waste category	Volume, m^3	Distribution, %
LLW and ILW (short-lived waste)	875,9	95
LLW and ILW (long-lived waste)	17,6	2
NORM waste	23,7	3
Total	**917,2**	**100**

Annex C. References to Estonian national laws and regulations related to safety of spent fuel and radioactive waste

The Estonian legislation listed below as in force of 1 October 2014. The legislation is available in Estonian (and partly in English) at the web site of the Radiation Safety Department of the Environmental Board: www.keskkonnaamet.ee, the Ministry of Justice http://www.just.ee/23295, the electronic database of the State Gazette www.riigiteataja.ee (in Estonian), etc.

Acts:

- Radiation Act, enforced in 1 May 2004, as amended in 22 February 2005, 10 May 2006, 7 December 2006, 24 January 2007, 18 December 2008 and 15 June 2009, 16 September 2009, 27 October 2011, 19 February 2014, 19 June 2014
- Environmental Supervision Act, enforced in 06 June 2001, as amended in 16 June 2002, 13 November 2002, 11 December 2002, 17 December 2003, 14 April 2004, 21 April 2004, 13 April 2005, 12 October 2005, 08 February 2007, 27 January 2011, 10 October 2012, 25 August 2013, 19 February 2014, 19 June 2014.
- Emergency Act, enforced in 15 June 2009, as amended in 26 November 2009, 5 May 2010, 21 October 2010, 27 January 2011, 08 December 2011, 13 June 2012, 17 October 2012, 19. February 2014, 13 February 2014, 19 February 2014 and 07 May 2014
- Environmental Impact Assessment and Environmental Management System Act, passed 22 February 2005, as amended in 7 December 2006, 21 February 2007, 19 June 2008, 18 December 2008, 27 January 2010, 26 October 2010, 06 December 2011 and 19 February 2014

Regulations of the Government:

- Regulation No. 163 of 30 April 2004, as amended in 11 February 2010: The Bases for Calculation of Exemption Values, and the Exemption Values for Radionuclides
- Regulation No. 193 of 17 May 2004: Effective Dose and Equivalent Dose Limits for the Lens of the Eyes, Skin and Extremities for Exposed Workers and Members of the Public
- Regulation No. 243 of 8 July 2004, as amended in 15 January 2009 and 10 December 2009: Procedure Specifications for Processing Documents of Import, Export and Transit of Radioactive Waste Based on Country of Origin and Destination
- Regulation No. 244 of 8 July 2004, as amended in 15 January 2009 and 01 August 2011: Statutes for the Maintenance of the State Dose Register of Exposed Workers
- Regulation No. 92 of 1 July 2010: Order of Informing of the Public about the Immediate Danger for Arising of the Emergency Situation, about the Emergency Situation and about the Management of the Emergency Situation and the Requirements to the Forwarded Information
- Regulation No 57 of 6 May 2010: Procedure of Notification of the Ministry of the Interior of An Emergency or of the Impending Risk of the Occurrence of An Emergency

Regulations of the Minister of the Environment

- Regulation No. 41 of 29 April 2004, as amended in 31 May 2006, 21 January 2009 and 04 March 2014: Time Limits for Proceedings to Issue, Amend or Revoke the Radiation Practice Licences, the Specific Requirements for and Format of Applications for Radiation Practice

Licences, and the Format of Radiation Practice Licences

- Regulation No. 86 of 8 July 2004, as amended in 21 January 2009: Requirements for the Radiation Safety Training of Exposed Workers
- Regulation No. 93 of 14 July 2004: Intervention and Action Levels, and Emergency Exposure Guidance in a Radiological Emergency
- Regulation No. 110 of 27 August 2004, as amended in 21 January 2009: The Requirements for the Results of Individual Monitoring of Outside Workers, and for Formalising Such Results, and for the Standard Format for the Dose Chart of Outside Workers
- Regulation No. 113 of 7 September 2004, as amended in 31 May 2006: Requirements for the Rooms Where the Radiation Sources Are Situated and for Labelling Thereof and for the Working Rules for the Performance of Radiation Practices
- Regulation No. 127 of 12 October 2004, as amended in 21 January 2009: The Format of Activity Licences of Qualified Experts and Applications Therefore and the Procedure for the Issue, Extension, Suspension and Revocation of Activity Licences
- Regulation No. 8 of 9 February 2005, as amended in 21 January 2009: The Classification of Radioactive Waste, the Requirements for Registration, Management and Delivery of Radioactive Waste and the Acceptance Criteria for Radioactive Waste
- Regulation No. 10 of 15 February 2005, as amended in 21 January 2009: Clearance Levels for Radioactive Substances and Materials Contaminated with Radioactive Substances Resulting from Radiation Practices, and the Requirements for Their Clearance, Recycling and Reuse
- Regulation No. 45 of 26 May 2005, as amended in 21 January 2009: The Procedure for Monitoring and Estimation of Effective Doses Incurred by Exposed Workers and Members of the Public, and the Coefficients for Calculating Radionuclide Ingestion and Inhalation Doses
- Regulation No. 13 of 20 May 2014: Statute of the Environmental Board
- Regulation No. 50 of 30 July 2002, as amended in 21 August 2003, 15 May 2008 and 26 March 2010 and 23 May 2013: Establishment of National Environmental Monitoring Stations and Areas

Regulations of the Minister of the Interior:

- Regulation No 15 of 8 June 2010: The Guidelines for Preparing An Emergency Plan
- Regulation No 5 of 18 February 2010, as amended in 13 April 2010 and 09 November 2010: The Guidelines for Preparing An Emergency Risk Assessment

Annex D. References to Estonian national and international reports related to safety of spent fuel and radioactive waste

National Reports

- National Report from Estonia. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Fourth Review Meeting, May 2012, Environmental Board.
  http://www.keskkonnaamet.ee/public/kiirgus/3rd_JCReport_Estonia.pdf
- Convention on Nuclear Safety. 3nd Estonian National Report on Compliance with the Obligations of the Convention on Nuclear Safety as referred to in Article 5 of the Convention. Sixth Review Meeting March/April 2014, Environmental Board
  http://www.keskkonnaamet.ee/public/ajutine/test/Convention_Nuclear_Safety_ESTONIA_2013.pdf

Other

- National Development Plan for Radiation Protection 2008-2017, Tallinn, 2008. http://www.envir.ee/sites/default/files/korakik.pdf
- Peer appraisal of the arrangements in the republic of Estonia regarding the preparedness for responding to a radiation emergency 26 September - 5 October 2011
  http://www.keskkonnaamet.ee/public/Final_EPREV_Report_1.pdf