



REPUBLIC OF ESTONIA  
ENVIRONMENTAL BOARD

**5<sup>th</sup> Estonian National Report on Compliance with the  
Obligations of the Convention on Nuclear Safety**

**as referred to in Article 5 of the Convention**

**8th Review Meeting**

Environmental Board

Tallinn, Estonia

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of the Convention on Nuclear Safety**

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## Chapter 1 Introduction

Estonia is a state in the Baltic region of Northern Europe with a population of 1.31 million. The territory of Estonia covers 45,227 km<sup>2</sup>. Estonia is a Member State of the IAEA since 1992. The Convention on Nuclear Safety came into force for Estonia on 4 May 2006. Estonia is a member state of the European Union from 1<sup>st</sup> of May 2004. Thus, EU regulations in the field have been transposed to national legal and administrative framework in Estonia. When necessary, Estonian legislation is amended and modified to take into account the new EU regulations and their amendments.

The present report is the Fifth Estonian National Report to the 8<sup>th</sup> Review Meeting of the Convention on Nuclear Safety. The Report provides an update on previous reports under the terms of the Convention on Nuclear Safety. The report is structured in conformity with the “Guidelines regarding national reports under the Convention on Nuclear Safety” (INFCIRC/572/Rev.6). The comments, questions and remarks given to Estonia’s 4<sup>th</sup> national report and Estonia’s presentation given at the 7<sup>th</sup> Review Meeting have been incorporated. This Report gives an overview of the national policy, State institutional framework, legal regime and the implemented administrative and technical measures related to nuclear safety and emergency preparedness. It also sets out measures adopted by Estonia to implement the relevant obligations of the Convention.

Based on the INFCIRC/572/Rev.6 the reporting on Articles 7, 8 and 16 is applicable for Contracting Parties with no nuclear installations planned or in operation, reporting on activities covered by Articles 9, 10 and 15 is encouraged. There are no nuclear power plants or facilities operating with nuclear fuel cycle in Estonia, neither any activities related to nuclear fuel cycle. In 2017, Estonian Government approved the “National Development Plan of the Energy Sector until 2030” (NDPES), which does not foresee use of nuclear energy in Estonia. Therefore, this Report presents information on activities covered by Articles 7, 8, 9, 10, 15 and 16 of the Convention on Nuclear Safety. The Vienna Declaration on Nuclear Safety outlines the principles for implementing the objectives of the Convention related to states with nuclear installations. These principles are not addressed in this Report since Estonia has no nuclear installations and no plan for construction of such.

Interest of Estonia in nuclear safety is primarily related to the safety of nuclear installations in the neighboring countries and to the implications that accidents at such installations, should they occur, may have on the health of the population and on the environment. The foreign nuclear power plants close to borders of Estonia are Loviisa NPP in Finland (103 km), Leningrad NPP in Russia (79 km) and Ignalina NPP in Lithuania (215 km, under decommissioning since 2009). Therefore, Estonia is, according to Article 16, obliged to “take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency”. As nuclear emergency preparedness is a direct obligation for Estonia in relation to the Convention, this item is dealt with in greater detail in the Report.

The Report pays attention on progress made in the areas identified as suggestions and challenges during the Forth Review Meeting:

- 1) Ensuring that Estonia has concluded cooperation agreements related to emergency preparedness and response with its neighbouring countries.
- 2) Implementation of the National Radiation Safety Development Plan (NRSDDP) 2018-2027,

including the relevant IRRS findings related to appropriate steps for the preparation and testing of emergency plans.

3) Relevant training of the staff remains a challenge.

The main developments in the field since the 4<sup>th</sup> National Report in August 2016 described in the present Report are the following:

- 1) Adoption of the new Radiation Act (entered into force on 1 November 2016) and upgrade of the legal framework.
- 2) Transposition of the Council Directive 2013/59/Euratom.
- 3) Compilation of the new National Radiations Safety Development Plan for 2018-2027 (planned approval in October 2019).
- 4) IRRS mission in September 2016, IRRS follow-up mission and ARTEMIS mission in March and April 2019.

The Report 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 30 July 2019, unless stated otherwise.

Estonia is Contracting Party for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention). Handling of radioactive waste shall be reported to that Convention accordingly. Estonia does not have a policy for spent fuel management, as there is no nuclear fuel in Estonia. There is, however, the former nuclear submarine training center together with two reactor compartments in Paldiski site (*Paldiski site*), but spent fuel was removed from the reactors and taken back to Russia already in 1995. Consequently, reporting about the Paldiski site and its developments will be presented in the reports to the Joint Convention and not to the Nuclear Safety Convention. Annex A of the Report gives a brief overview of the shut-down nuclear submarine reactors in the Paldiski site.

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 by amending the Radiation Act. Based on discussion with the European Commission, the Paldiski site and radioactive waste storage located on the same site do not directly fall within the scope of Directive 2009/71/Euratom. Therefore, Estonia must implement the requirements of this directive at general level. The Radiation Act was amended with relevant definitions, requirements of passing a principle decision by the *Riigikogu* (Parliament of Estonia) on establishment of a nuclear installation, obligations of the license holder of nuclear installations and quality assurance requirements to ensure nuclear safety. Although, the Section 79 of the Radiation Act lays down, that a radiation practice license for the operation of a new nuclear facility can be applied for after the *Riigikogu* has adopted a decision on commissioning of a nuclear facility, the relevant nuclear legislation is required, if Estonia decides to start using nuclear energy. In 2013 the Council Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste was transposed into Estonian legislation and in 2015 National Programme for Radioactive Waste Management was adopted. During the codification process of Environmental Law in Estonia, the new Radiation Act entered into force on 1 November 2016. In 2017, the Radiation Act was amended due to the transposition of Council Directive 2014/87/EURATOM of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations. In 2018, amendments to the Radiation Act and its regulations entered into force and new regulations were adopted to transpose the 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, and

repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom.

The structure of the Report is as follows:

- 1) Chapter 2 presents an article-by-article review of Estonian legislative and regulatory system, regulatory body, responsibility of the licensee, radiation safety and protection requirements and emergency preparedness;
- 2) Chapter 3 presents the suggestions and challenges identified during the Forth Review Meeting and the efforts made and measures taken to address them;
- 3) Summary includes main developments since previous National Report and planned activities to improve safety;
- 4) Chapter 4 includes Annexes A to D providing brief overview of the shut-down nuclear submarine reactors in the Paldiski site and reference to Estonian national laws and regulations, national and international reports related to safety and compilation of treaties signed by Estonia.

The report is prepared by the Environmental Board in cooperation with the Ministry of the Environment, the Environmental Inspectorate and the Estonian radioactive waste management agency A.L.A.R.A. Ltd. The main conclusions of the Report are the following:

- 1) Estonian nuclear and radiation regulations fulfil the obligations of the Convention;
- 2) Estonian regulatory infrastructure is in compliance with the Convention obligations;
- 3) regulatory and licensee practices comply with the Convention obligations;
- 4) Estonian radiological and nuclear emergency preparedness system has a high standard and complies fully with the Convention.

## Chapter 2 Article-by-article review

### Article 7. Legislative and regulatory framework

1. *Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations.*
2. *The legislative and regulatory framework shall provide for:*
  - i. *the establishment of applicable national safety requirements and regulations;*
  - ii. *a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a license;*
  - iii. *a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licenses;*
  - iv. *the enforcement of applicable regulations and of the terms of licenses, including suspension, modification or revocation.*

### *National legislative and regulatory framework*

In Estonia, radiation safety activities are organized by the Ministry of the Environment within its area of competence through the Environmental Inspectorate and the Environmental Board by engaging other appropriate agencies for this purpose and by taking inter alia into account field-specific operational experience, results of decision making procedures, development of relevant technology and scientific researches. Radiation safety requirements are developed mainly in cooperation between the Ministry of the Environment (including subdivisions Environmental Board, Environmental Inspectorate), Ministry of Social Affairs (Health Board, hospitals), Ministry of Interior (Police and Border Guard Board, Rescue Board, Estonian Internal Security Service), Ministry of Finance (Tax and Customs Board), Ministry of Economic Affairs and Communications (radioactive waste management agency A.L.A.R.A. Ltd).

The legislation for radiation protection framework was established in 1997, when the first Radiation Act entered into force. In 2004, Estonia joined the European Union. The process required preparation of several amendments to the Radiation Act, which were necessary to comply with the relevant European Atomic Energy Community (EURATOM) Directives. Therefore, a new version of the Radiation Act entered into force in 2004. After joining the European Union it became evident that environmental law needs a more consistent approach in Estonia. The codification process of environmental law started in 2011 and the new Radiation Act was drafted. Due to the codification process of environmental law the General Part of the Environmental Code Act was approved by the *Riigikogu* on 16 February 2011 and it entered into force on 1 August 2014. The General Part of the Environmental Code Act contains general information regarding licence proceedings and the extent of the state supervision. The Radiation Act was reviewed and re-enacted in order to ensure its consistency with General Part of the Environmental Code Act. The new Radiation Act entered into force on 1 November 2016. Main legislature of radiation protection and safety is covered by these two acts. The content of the new 2016 Radiation Act remained largely unchanged compared to the previous version. However, a number of changes specifying the content and the structure were made. In the new Radiation Act, processes related to the proceeding of applications of radiation practice license were clarified to minimize administrative burden to applicants and administrative authorities. The latest amendments to the Radiation Act entered into force in June 2018 16 sub-acts (regulations) have been issued pursuant to the Radiation Act.

The General Part of the Environmental Code Act and its implementing regulations state requirements for the Information System for Environmental Decisions and the datasets of an environmental permit. The Emergency Act and its implementing regulations deal with emergency preparedness. The Environmental Inspectorate may apply the special measures for state supervision provided for in the Law Enforcement Act, which also contains measures for intervention in emergency exposure situations. Environmental Impact Assessment and Environmental Management System Act and its implementing regulations state conditions of environmental impact assessment. Penal Code applies to the imposition of punishments for offences related to radioactive material. These are the main documents used by the Government and the Ministry of the Environment as a reference. The relevant legislation on radiation and nuclear safety as in force on 30 July 2019, are given in Annex B of this Report.

The Radiation Act is supported by a “National Radiation Safety Development Plan” (NRSDP) which is a ten-year programme for development and enhancement of radiation and nuclear safety in Estonia. The objectives of the NRSDP are to minimize radioactive waste; improve emergency preparedness; optimize the use of radiation in medicine; reduce risks from natural radiation sources and to raise awareness amongst the Estonian public of radiation-related issues. The first NRSDP was adopted in 2008 and covered the period until the end of 2017. It was approved by the Government. The new draft NRSDP for the period of 2018-2027 has 3 annexes. The strategic environmental assessment of the new NRSDP is launched and final version of the NRSDP draft is currently in the phase of public display. After coordinating the updated version of the NRSDP together with its annexes with relevant authorities and stakeholders, it is approved by the Minister of the Environment by a Decree and made publicly available. The formal approval is expected by October 2019. The NRSDP 2018-2027 consists of the main document and 3 annexes (includes sectoral sub-plans), which are National Programme for Radioactive Waste Management (NPRW), National Radon Action Plan and the Action Plan for Implementing the NRSDP. The NPRW describes the institutions, technical and financial resources, and research and development activities for safe radioactive waste management, and provides sub-objectives, measures, and expected results of the field until 2050. The need for the preparation of a national programme for radioactive waste management arises from both the NRSDP and from the Council Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. The first NPRW was approved by the Minister of the Environment in August 2015 and it was updated in 2018. The Action Plan for Implementing the NRSDP is established for 4 year period for 2018-2021. The second Action Plan for Implementing the NRSDP shall be establish for another 4 year for 2022-2025 and the third on for the 2-years period of 2026-2027.

The NRSDP is regularly reviewed and updated (as often as needed), taking into account technical and scientific achievements and expert recommendations, best experiences, and best practices. Changes are officially initiated with the Decree of the Minister of the Environment, which announces the intention to edit the NRSDP. Ministry of the Environment sends the Decree to all of the relevant authorities, who have a possibility to participate in this process and give their input. Depending on the contents and volume of the changes, strategic environmental assessment might be launched, when the final version of the updated NRSDP draft is composed. During this process, the NRSDP is also put on public display.

Pursuant to Subsection 29 (2) of the Radiation Act, the Ministry of the Environment organizes State radiation safety audits at least every ten years and immediately when an emergency exposure situation occurs at a nuclear facility. During period 2016-2019 Estonia has had three international audits. In September 2016 Estonia hosted the IAEA IRRS mission and its follow-

up mission in March 2019. From 24<sup>th</sup> of March – 1<sup>st</sup> of April 2019, Estonia hosted the IAEA ARTEMIS mission. Reports are publicly available on the websites of the Ministry of the Environment. The reports are listed in the Annex C to this Report. In addition, the Ministry of the Environment is responsible for organizing topical peer reviews at least every six years, which is a requirement of the Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations. A topical peer review is a national assessment carried out for the purposes of ensuring nuclear safety and the report prepared on it shall be submitted for assessment to other Member States of the European Union and the European Commission. The results of topical peer reviews shall be taken into consideration in preparation of the NRSDP and its action plans.

According to the Radiation Act's Subsection 30 (1), the Environmental Board and the Health Board shall promote, within their area of competence, radiation awareness, use of good practice and compliance with radiation safety principles, and issue radiation and nuclear safety guidelines and information materials which are published on the website of the Environmental Board and the Health Board.

Legislative drafting, amendments to the legal acts, radiation safety policy planning and making changes to these documents is coordinated with all relevant authorities and stakeholders. In addition, in the drafting phase, usually their input is being asked. For more challenging tasks dedicated working groups from relevant government authorities representatives and stakeholders are established. Members of the public and private companies have the possibility to participate during the public display procedure. All draft versions of legal acts and national policy planning documents are put on public display. Public engagement and participation are one of the key elements in decision making in Estonia. The Government has adopted a Good Practice of Engagement and in environmental matters it is also regulated with the General Part of the Environmental Code Act's Section 28.

In the international context, Estonia has signed, ratified/approved several treaties, agreements and conventions, the listing of which is given in Annex D to this Report.

### ***System of licensing***

Radiation Act consists of 11 chapters, relevant chapters to this Report are described. The system of licensing of radiation practices is prescribed in Chapters 3 - 6 (Sections 32 – 99) of the Radiation Act. The use of radiation source requires a radiation practice license (hereinafter *license*), which is granted by the Environmental Board upon application. Radiation source is defined as an apparatus, radioactive substance or installation capable of emitting ionizing radiation or radioactive substances. According to the definition given in Section 4 of the Radiation Act, radiation practices are any activities which increase or may increase the exposure of people to radiation emanating from artificial or natural sources of radiation. Such activities are, *inter alia*:

- 1) production, processing (processing means chemical or physical operations on radioactive material including the mining, conversion, enrichment of fissile or fertile nuclear material and the reprocessing of spent fuel), use, possession, holding, storage, transportation, including import and export, and intermediate storage or final disposal of radioactive substances;
- 2) use of any electrical equipment emitting ionizing radiation and operating at a potential difference of more than 5 kilovolts;



3) operation of nuclear facilities.

The Section 68 of the Radiation Act sets forth the activities for which a radiation practice license is obligatory:

- 1) exploitation, closure and decommissioning of any facility of nuclear fuel cycle;
- 2) production, use, storage and transportation of radioactive substances and products containing it, including for importation and exportation;
- 3) use and storage of electrical radiation apparatuses;
- 4) management and transportation of radioactive waste;
- 5) activities related to the presence of increased natural exposures in the case of which the exposure caused by natural radionuclides is important from the radiation safety point of view.

Commencement of radiation practices or performance of radiation works which require a radiation practice license without a radiation practice license is prohibited.

The Subsection 36 (1) of the Radiation Act states, that a radiation source may be installed, repaired and maintained only by a person holding a radiation practice license issued for the specified activity.

The Section 41 of the Radiation Act describes the conditions for transport of radioactive substances and apparatuses containing radioactive substances. Radioactive substances and apparatuses containing radioactive substances in which the activity or activity concentration of radionuclides exceeds the exemption level shall be transported by road, railway and air and waterway pursuant to the procedure provided for in legislation concerning hazardous loads. Transportation over the state border shall comply with international agreements in force in respect of the Republic of Estonia and based on Estonian legislation.

The Subsection 96 (2) of the Radiation Act describes the activities in the case of which natural radiation sources may cause exposures to workers or members of the public in excess of the effective dose limits established for members of the public. Activities, in the case of which natural radiation sources may cause a significant increase of the exposure of workers and members of the public, are following:

- 1) extraction of rare earths from monazite;
- 2) production of thorium compounds and manufacture of thorium-containing products;
- 3) processing of niobium/tantalum ore;
- 4) oil and gas production;
- 5) geothermal energy production;
- 6) TiO<sub>2</sub> pigment production;
- 7) thermal phosphorus production;
- 8) processing of zircon and zirconium;
- 9) production of phosphate fertilizers;
- 10) cement production and maintenance of clinker ovens;
- 11) operation of coal-fired power plants and maintenance of central heating boilers;
- 12) phosphoric acid production;
- 13) primary iron production;
- 14) tin, lead and copper smelting;
- 15) operation of groundwater filtration facilities;
- 16) mining of ores other than uranium ore.

If, during performing work, which involve increased natural radiation, a worker receives or may receive an effective dose that is higher than the upper annual limit of the effective dose of members of the public established under the Radiation Act, such activities are deemed to be radiation practice and a radiation practice license needs to be applied for.

Under the Radiation Act nuclear facilities are subject to the authorization by the Environmental Board. According to the Section 79 of the Radiation Act, it is clearly stated that the license to operate a nuclear installation can be applied only after the *Riigikogu* has made the decision to take a nuclear installation into use.

The Subsection 68 (2) of the Radiation Act identifies the cases, when a license is not required, e.g. when law exempts the use of radiation source. The bases for calculation of exemption levels of radionuclides and the exemption levels below which no radiation practice license is required is established with Regulation No 96 of the Government of the Republic.

According to the Subsection 34 (1) of the Radiation Act, radiation practices are divided into the following risk categories depending on the risk presented by the radiation practice or the radiation source:

- 1) low risk radiation practices during which an exposed worker incurs or may incur an effective dose of up to one millisievert per year;
- 2) moderate risk radiation practices during which an exposed worker incurs or may incur an effective dose of up to six millisieverts per year;
- 3) high risk radiation practices during which an exposed worker incurs or may incur an effective dose exceeding six millisieverts per year.

In addition to the provisions of Subsection 34 (1), a radiation practice is of high risk if the radiation practice license is applied for:

- 1) radiation practices related to high-activity sources;
- 2) operation of nuclear facilities;
- 3) exploitation, closure and decommissioning of any facility of nuclear fuel cycle;
- 4) intermediate storage or final disposal of radioactive waste.

In determining the terms of the license, and in amending or revoking of the license, the Environmental Board proceeds from the specific radiation practice, taking into account the main principles of radiation safety. When granting of a radiation practice license, it can be subject to additional terms to ensure safety. The terms of the license shall be weighted and justified based on the Radiation Act and the Administrative Procedure Act. According to the Section 76 of the Radiation Act a radiation practice license is issued, in the case of moderate and high risk radiation practices, for a term of up to five years. For low risk radiation practices the license is issued for an unspecified term. Since the Radiation Act does not provide for the extension of the radiation practice license, a new license needs to be applied for to continue radiation practice.

The Section 70 of the Radiation Act describes the scope of the application. In order to obtain a radiation practice license, an applicant shall submit an application to the Environmental Board with the following information and documents:

- 1) data which characterize the radiation source and technology used and the equipment;
- 2) data on radioactive waste or emissions generated during radiation practices, the management thereof and waste packaging compliance criteria and radioactive waste storage premises;
- 3) recovery plan of radiation source after the termination of use of the radiation source;

- 4) upon application for a license for management, intermediate storage and final disposal of radioactive waste, data on the management or methods of final closure of repositories for radioactive waste;
- 5) radiation safety assessment, which gives an overview of the aspects of radiation practices which are related to the protections of people and safety of radiation sources, including of the protective and safety measures used, and of the potentially assessed doses of exposed workers and members of the public both under normal working conditions and in the cases of accidental and existing exposure situations, to which data on measures adopted to ensure radiation safety are appended;
- 6) in the case of moderate and high risk radiation practices, dose constraints on annual equivalent or effective doses of exposed workers and effective doses of members of the public upon proposed radiation practices under normal working conditions;
- 7) emergency response plan to emergency exposure in the case of radiation practices involving high risk which is based on the assessment of potential exposures;
- 8) financial collaterals required for recovery of radioactive sources, equipment containing thereof and radioactive waste;
- 9) description of the radiation safety quality management system;
- 10) data on exposed workers and their professional training;
- 11) radiation work rules, which must contain activities for the use of a radiation source, discontinuation of the use thereof and activities related thereto depending on the specific character of the radiation work;
- 12) plan for radiation monitoring and data on the equipment used for radiation monitoring.

An application for a radiation practice license together with the annexes thereto shall be submitted to the issuer of licenses through the Information System for Environmental Decisions and the application shall be certified by digital signature.

The data and content of the documents to be submitted when applying for the radiation practice license are specified in Regulation No 60 of the Minister of the Environment, “Detailed requirements for applications for radiation practice licenses, lists of data of applications and radiation practice licenses, and lists of data characterizing radiation sources used to keep lists of nuclear materials” (Regulation No 60 of the Minister of the Environment). The Regulation No 60 of the Minister of the Environment describes formal requirements:

- 1) for proceedings for the application of the license (applying, amendment and open proceedings);
- 2) for the content for the application of the license;
- 3) for the forms for the license.

Pursuant to the Regulation No 60 of the Minister of the Environment, the issuer of a license reviews the data and documents submitted by the applicant and, if needed, checks their conformance to the actual situation. If the issuer of the license imposes a deadline for the applicant to remedy deficiencies or submit specifying data on the materials of the application, the deadline for the processing the application will be extended by the time of remedying the deficiencies or submitting specifying data. If the applicant fails to do so by the term given, the issuer of the license will return the application without review within 5 days after the deadline.

According to the Subsections 75 (1 and 2) of the Radiation Act, in addition to the requirements in the Section 53 of the General Part of the Environmental Code Act, the radiation practice license shall set out the following:

- 1) number and date of issue of the radiation practice license;

- 2) name of radiation practice;
- 3) data on and description of radiation sources;
- 4) methods of management of radioactive waste, maximum quantities and management and storage facilities thereof;
- 5) maximum quantities of radioactive emissions, and modes of release thereof into the environment;
- 6) requirements for radiation safety and radiation monitoring arising from radiation practice and the specific character thereof;
- 7) risk level of the radiation practice;
- 8) existence of financial collateral.

The license issued for radiation practice related to high-activity sources contains in addition the following information:

- 1) radiation protection competence of the workers, including training of them;
- 2) requirements for the radiation source, container of the radiation source and additional equipment and their maintenance;
- 3) management of disused sources until delivery thereof to a manufacturer, another person holding the radiation practice license or radioactive waste storage facilities.

A radiation practice license and the decision on issue thereof shall be prepared via the Information System for Environmental Decisions and signed digitally.

A holder of a radiation practice license shall give prior notice to the issuer of licenses via the Information System for Environmental Decisions if the holder intends to:

- 1) commission new or additional radiation sources;
- 2) terminate the use of the radiation source indicated in the radiation practice license;
- 3) deliver the radiation source to another person or dispose of it as radioactive waste;
- 4) change the radiation practice, method of management, maximum quantities or storage facilities of produced radioactive waste determined in the radiation practice license;
- 5) change the location, facilities or premises where the radiation practice is carried out;
- 6) employ a new radiation safety specialist;
- 7) significantly change the radiation practice described in the license in any other manner.

Upon receiving an application to amend the radiation practice license, the Environmental Board reviews the data and documents submitted by the applicant and, if needed, checks their conformance to the actual situation pursuant to the Regulation No 60 of Minister of the Environment. Where a change is critical from the perspective of radiation safety, the Environmental Board may require that the holder of the license submits an application for a new radiation practice license. The specialists of the Environmental Board have access to all premises during the licensing process.

The provisions of open procedure are applied to the procedure of granting and amending radiation practice licenses (pursuant to Section 71 of the Radiation Act) if a radiation practice license is applied for the following activities:

- 1) exploitation, closure and decommissioning of any facility of nuclear fuel cycle;
- 2) activities related to the presence of increased natural exposures in the case of which the exposure caused by natural radionuclides is important from the radiation safety point of view;
- 3) management and transportation of radioactive waste.

The Environmental Impact Assessment and Environmental Management System Act states, that environmental impact shall be assessed upon applying for development consent or for amending development consent whereby the proposed activity which is the reason for applying for or amending the development consent potentially results in 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 or handling or final disposal of used nuclear fuel or disposal of used nuclear fuel for over ten years on a site other than the place of generation thereof;
- 3) handling high-activity radioactive waste, final disposal of merely radioactive waste or disposal thereof for over ten years on a site other than the place of generation.

According to the Section 47 and 48 of the General Part of the Environmental Code Act, the time and place of the public display of the application of the radiation practice license and draft of the radiation practice license shall be made known at least two weeks before the beginning of the public display in the official publication *Ametlikud Teadaanded* (Official Announcements<sup>1</sup>) and the website of the Environmental Board. Within the time limit set by the issuer of a license, everyone has the right to submit to the issuer of the radiation practice license positions and questions on the publicly displayed application for the radiation practice license or draft administrative decision to be made thereon. The time limit must not be shorter than two weeks as of informing of the display.

In June 2018, an amendment of General Part of the Environmental Code Act and the Radiation Act about submission of an application for a radiation practice license, together with the annexes and issue a radiation practice license and the decision via the Information System for Environmental Decisions, entered into force. The digitally signed application for an authorization of radiation practice, shall be submitted and formalized through the Information System for Environmental Decisions, which is an online system. Automated data processing is used to maintain the database and the data is stored in digital form. The purpose of maintenance of the Information System for Environmental Decisions is to facilitate and simplify the application for and the processing of different kind of environmental permits and radiation practice licenses, the performance of monitoring, reporting duties and other duties related to the permit or license as well as the retention, use and availability of collected data and to ensure the safety and physical protection of radiation sources and nuclear material. The Information System for Environmental Decisions is established by Regulation No 20 of the Minister of the Environment “The environmental decisions information system and its statutes” pursuant to the General Part of the Environmental Code Act. The data exchange is provided with the following databases, *inter alia*:

- 1) the commercial register – the data of the right of representation of a legal person;

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<sup>1</sup> <https://www.ametlikudteadaanded.ee/>

The Official Announcements is an electronic journal that publishes all notices, invitations and announcements prescribed by the legislation. The website of the Official Announcements is freely accessible to everyone and new announcements are published there on every business day, as they are issued. Since 1 July 2003, the Official Announcements is published only electronically. Announcements can be issued: 1) Electronically via the website; 2) From other information systems via the X-road system. Both private persons and agencies can issue official announcements. The person issuing the announcement is liable for its contents. Announcements can be read and issued only in Estonian.

- 2) the system of address details – address data;
- 3) e-State Treasury – data on the state fee paid.

The Environmental Board is responsible for maintaining several the registries related to radiation safety. Estonia has the register of the radiation sources and nuclear material since 1997. As the register was technologically obsolete and no technical support, the Environmental Board started in 2017 with process develop new register in order to meet today's requirements. Decision was made to develop the register together with proceedings of applications of radiation practice licenses and reporting thereof into Information System for Environmental Decisions to keep data in same database as well simplify the maintenance of the data. The Information System for Environmental Decisions is in use for the authorization of radiation practices and reporting data on compliance with obligations and the requirements provided for in the license and in the Radiation Act and for the register of radiation sources and nuclear material since first half of 2018. Environmental Board collects and analyses the inventory reports of radiation sources as well as data on compliance with obligations and the requirements provided for in the license and in the Radiation Act. The data related to radiation practices are not publicly available based on Public Information Act, General Part of the Environmental Code Act and Radiation Act.

#### ***System of the inspection and enforcement***

The main legal acts regulating supervision over radiation safety are the Environmental Supervision Act, Law Enforcement Act, Code of Misdemeanour Procedure, Administrative Procedure Act and Radiation Act. Pursuant to the Environmental Supervision Act, the Environmental Inspectorate executes environmental supervision in Estonia at the state level. Environmental Inspectorate coordinates and executes supervision of all areas of environmental protection and the use of natural resources, as well as conducts proceedings in environmental violations. The Environmental Inspectorate has direct access to all premises, buildings, etc., for inspection purposes and has granted a right to withdraw licenses and suspend operations in unsafe situations. The Environmental Inspectorate has the right to suspend unlawful activities damaging or dangerous to the environment, if such activities endanger the life, health or property of people.

Chapter 9 and 10 (Sections 112 – 122) of the Radiation Act establishes the inspection body, who exercises state supervision over radiation safety, supervision measures and defines the misdemeanours related to radiation practices and radioactive sources. The Environmental Inspectorate as stated in Section 112 of the Radiation Act carries out state supervision of radiation safety.

Regarding radiation safety, the responsibility of Environmental Inspectorate is to implement measures provided by law for the prevention of illegal activities and implementation of mandatory environmental protection measures. Upon identification of practice not compliant with the Radiation Act, the Environmental Inspectorate initiates administrative or misdemeanour proceedings according to the procedure set forth in the Administrative Procedure Act (Sections 2, 8) and the Code of Misdemeanour Procedure (Sections 1, 8, 9, 10). Pursuant to the Section 7 of the Law Enforcement Act, in the performance of state supervision a law enforcement agency shall adhere to the following proportionality principles:

- 1) out of several suitable and necessary state supervision measures a law enforcement agency shall apply the one which will presumably harm a person as well as the public the least;
- 2) applies only such a state supervision measure that is proportional, taken into account the goal pursued by the measure and the situation requiring urgent implementation, and

- 3) applies a state supervision measure only as long as its goal has been achieved or can no longer be achieved.

Pursuant to Section 8 of the Law Enforcement Act, in the performance of state supervision a law enforcement agency shall act purposefully and efficiently, and within the limits of lawful discretion shall apply state supervision measures flexibly. Inspectors have the right to apply enforcement measures (conduct proceedings in environmental violations, precepts, suspension or termination of illegal activities, penalty payment, substitutive enforcement etc.) if violation is found. Fines in case of radiation practice are imposed on the basis of the rates set forth in Sections 117–121 of the Radiation Act and the Code of Misdemeanour Procedure (Subsection 55 (2)). The Section 122 of the Radiation Act establishes that the Environmental Inspectorate shall conduct extra-judicial proceedings concerning the misdemeanours provided for in Chapter 10 and according to the Statutes of the Environmental Inspectorate conducts pre-trial proceeding of crimes.

The radiation safety inspections of the Environmental Inspectorate are carried out either based on the work plan (an annual inspection plan is prepared collaboratively with the Environmental Board), in the course of control raids, or as a response to complaints. For scheduled inspections, the time of inspection is agreed upon, for control raids and complaints the inspection visits are unannounced. All relevant information and documents are evaluated by the Environmental Inspectorate in an annual workplan preparation process. The work plan is prepared and the sites are selected based on the field of activity of radiation practice, geographical region and the validity of the radiation practice license as well as data on compliance with obligations and the requirements provided for in the license and in the Radiation Act, which data is available in Information System for Environmental Decisions and is accessible by the Environmental Inspectorate. The annual plan is agreed with the Environmental Board and approved by the Director General of the Environmental Inspectorate. High-risk radiation practices are checked annually. The inspection of moderate and low-risk radiation practices is risk-based (taking into account the previous monitoring results, potential risks and Environmental Boards input). However, according to the work plan, inspections are performed with a frequency of at least once every three years for a moderate risk radiation practice and once every five 5 years for a low risk radiation practice. The aim of control raids is to check the situation unannounced, i.e., whether or not radiation practice occurs at the site. Check-ups are made on the complaint basis and information received from the Environmental Board. Additional check-up of other areas of environmental inspections include scrap metal dealers, manufacturing plants etc. Likewise, environment-related complaints and notifications received by the inspectorate are checked.

Basic features of an inspection of the holder of the radiation practice license include verification of the data and conditions specified in the radiation practice license. Where relevant, the data submitted in the application for radiation practice license is checked stated in the Subsection 70 (1) of the Radiation Act. In particular, the following features are checked:

- 1) the number and the data of equipment, installation and placement of the radiation source in the premise;
- 2) quality control of the equipment;
- 3) marking of the radiation source and the premises;
- 4) individual dose monitoring;
- 5) personnel training records;
- 6) personal protection equipment;
- 7) monitoring of control and supervised areas and radiation safety quality management system;
- 8) radiation safety instructions and an emergency response plan.

During inspections, the Environmental Inspectorate is entitled to examine the entire documentation on radiation practice. Inspections are carried out on the basis of:

- 1) general legal requirements, including the Radiation Act, recommendations of the International Atomic Energy Agency (IAEA);
- 2) the terms and conditions laid down in the radiation practice license;
- 3) check-lists, which have been developed for various field of activities on radiation practices and are used for quality control and harmonization purposes.

The Environmental Inspectorate maintains the object inspection database, which contains detailed results of the inspections. The object inspection database is established with the Regulation No 46 of the Minister of the Environment “Establishment of the object inspection database system and its statutes” pursuant to the Environmental Supervision Act. The Environmental Board have access to the object inspection database. In addition, the Environmental Inspectorate provides to the Environmental Board annual overview of inspections and its results.

Environmental protection inspectors are independent in their activities and make decisions on a case-by-case basis. In order to ensure consistency in enforcement actions across similar non-compliances with regulatory requirements and to ensure traceability of the enforcement action, a set of internal guidelines for imposing penalties was established by the Environmental Inspectorate. The following in-house documents have been composed to aid the inspection process:

- 1) a strategy plan of inspection (indicates obtaining inspection equipment, human resources and continuous training of inspectors as main priorities);
- 2) guidelines for drafting the work plan;
- 3) guidelines for conducting inspections;
- 4) check-lists for the inspection of various types of radiation practices;
- 5) guidelines for imposing penalties and penalty matrix.

Quality control of inspector`s decisions is carried out by the chief inspector annually, including assessment of inspection protocols and discussion of necessary improvements, and results are discussed directly with inspectors. In addition, enforcement decisions are reviewed by the Legal Department of Environmental Inspectorate. The Environmental Inspectorate limits itself with recording shortcomings and pointing out non-conformances if they do not cause disturbances in radiation practice and there is no threat to workers and members of the public. Although the Environmental Inspectorate has developed general set of internal guidelines for imposing penalties and penalty matrix that cover different ranges of fines and cessation of activities, there is no criteria for determining conditions and deadlines for taking corrective actions in response to a non-compliance discovered during inspection. The non-compliances are described in inspection report and deadline for corrective action is assigned by inspector on a case by case basis. In recent years, violations of conditions of radiation practice licenses have been mostly discovered in radiation practices with low risk.



## **Article 8. 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 7, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.*

*2. Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy.*

According to the Radiation Act's Section 25, radiation safety activities are organized by the Ministry of the Environment within its area of competence through the Environmental Inspectorate and the Environmental Board by engaging other appropriate agencies for this purpose and by taking inter alia into account field-specific operational experience, results of decision making procedures, development of relevant technology and scientific researches. The Environmental Board is authorized to fulfil the obligations of the Regulatory Authority in the country. Environmental Inspectorate, is provided to carry out regular inspections of the licensed practices. Ministry of Environment coordinates and executes supervisory control of the activities of both organizations. The status, areas of activity and tasks as well as the management of the organizations are set forth in the Statutes of the Environmental Board (Regulation No 13 of the Minister of the Environment) and the Statutes of the Environmental Inspectorate (Regulation No 12 of the Minister of the Environment). Both the Environmental Board and the Environmental Inspectorate have their own budget based on the annual national Fiscal Act.

The Environmental Board and the Environmental Inspectorate are required to prepare an annual activity report on its development plan, which is submitted to the Ministry of the Environment. The activity report of the Ministry of the Environment, in turn, is forwarded to the Ministry of Finance that coordinates the reporting of the development plans of all ministries.

The State Audit Office in their sectoral audits in turn, inspects the activities of the Environmental Board and the Environmental Inspectorate.

In Estonia, policy shaping (Ministry of the Environment), implementation of policies (Environmental Board) and environmental supervision (Environmental Inspectorate) are separate from each other. This contributes to independence from pressures from various sectors. From the perspective of the Radiation Safety Department, independence is also furthered by the fact that radiation safety issues are within the mandate of the Environmental Board, not subordinated to the Ministry of Social Affairs or the Ministry of Economic Affairs and Communications, which would implicate a more robust economic pressure on decision-making in the field of radiation safety.

The Radiation Act and its administration belong to the responsibility of the Ministry of the Environment, which, as such, is independent of 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, including energy.

There is no advisory body in Estonia in the domain of radiation protection but authorities have a chance to use the services of qualified experts and universities.

### ***The Environmental Board***

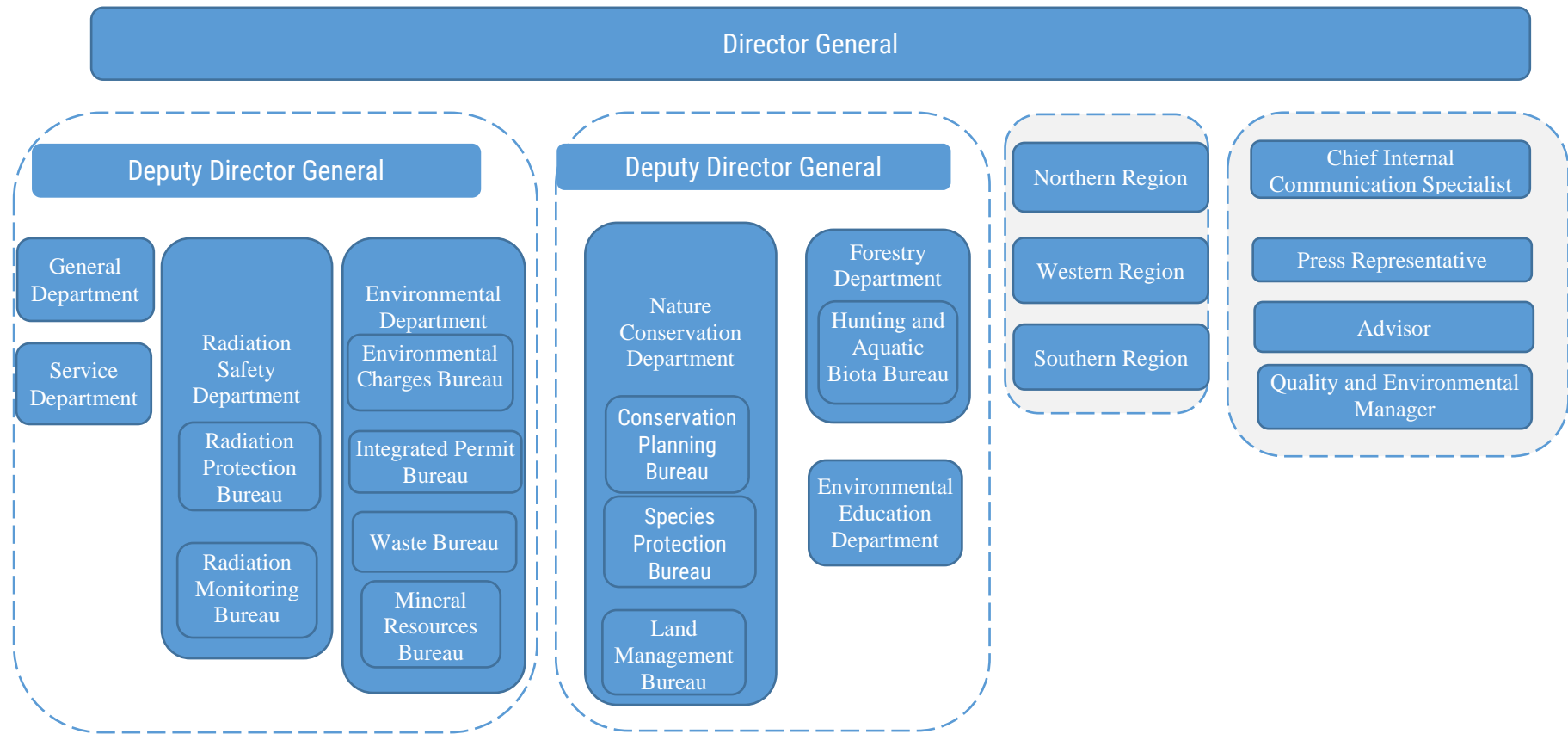
The Environmental Board was established in 2009 as a result of a merger of several environmental authorities in Estonia, including former Estonian Radiation Protection Centre, established in 1996. The mission, vision, core values and management system of the Environmental Board proceed from the tasks vested in the Environmental Board by legislation. The area of activity of the Environmental Board is set forth in the Subsection 5 (1) of the Statutes of the Environmental Board: “The area of activity of the board is national environmental and nature conservation protection and use as well as the implementation of radiation safety policies, programs and action plans.” According to its statutes, the Environmental Board has the following duties in the field of radiation protection and safety:

- 1) to participate in the development and implementation of the radiation protection and safety policy, development plans and programs;
- 2) to advise the regulatory authorities in radiation protection and safety;
- 3) to perform licensing of radiation practices;
- 4) to evaluate the radiation safety of existing and applied radiation practices;
- 5) to organize the assessment of population doses and doses to critical groups arising from radiation practices;
- 6) to maintain the registries related to radiation safety (state registry of the doses of radiation workers; registries of the radioactive sources, nuclear material and radioactive waste);
- 7) in cooperation with the Environmental Inspectorate to execute regulatory supervision of the radiation practice licenses;
- 8) to organize the monitoring of radionuclides in air, soil, water and food, radioactivity in the environment and to analyze the results;
- 9) to perform laboratory analyses related to radiation safety;
- 10) to perform assessment of public exposures;
- 11) 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;
- 12) to serve as a contact point for EURATOM and IAEA;
- 13) to serve as a national data centre (NDC) in the exchange of information in the framework of the CTBT agreement;
- 14) to participate in international cooperation, to prepare and to participate in international projects in the field of radiation safety;
- 15) to participate in the preparation of emergency situation management plans, in the testing of these plans and in the management of possible emergency cases.

Organizational structure of the Environmental Board is given in Figure 1.

The tasks and management of each structural unit of the Environmental Board, including the Radiation Safety Department, are defined in the statutes of each structural unit, approved by the General Director of the Environmental Board. In 2019 there were 345 workers in the Environmental Board, 16 of them working in the Radiation Safety Department. The number of employees in the Radiation Safety Department has remain the same over the last three years. The Radiation Safety Department is divided into two bureaus: the Radiation Protection Bureau and the Radiation Monitoring Bureau.

A variety of measures is applied to develop and maintain competence of employees. The performance of employees and their various competences are evaluated during annual performance review. As a result of the performance review interviews, training needs are identified which the human resource manager consolidates in the training plan of the



**Figure 1.** Organizational structure of the Environmental Board

Environmental Board. Performance reviews are conducted and competences are evaluated by direct supervisors. During a performance review the following aspects are covered:

- 1) evaluation of competences (incl. a discussion between the employee and the employer to clarify development needs);
- 2) evaluation of task fulfilment;
- 3) setting of goals for the next period (tasks and training courses in the next period).

Based on the performance reviews, an individual work and training plan is compiled for each employee every year. The management approves the annual training plan and allocates funds for this from the budget. The Ministry of the Environment gives to the organizations within its scope of administration, including the Environmental Board, the absolute budgetary amount. It is in the competence of the Environmental Board to allocate the budget within the organization. The budget is prepared through the activities planned in work plans (both the anticipated working time of employees and costs of work equipment are taken into account). Over the past three years the budget of the Radiation Safety Department has remained unchanged. The budget is sufficient to fulfill the obligations of the regulatory body.

The Environmental Board applies a process management model in its management system. Processes cover all the important activities of the organization and their continuous development is one of the principles of process management. The management system of the Environmental Board is adequately documented, although it is not described in a single document. All the critical activities of the Environmental Board have been described in 75 process maps. Additionally, the Environmental Board has adopted an environmental management system EMAS (the Eco-Management and Audit Scheme) that was introduced in 2011.

Opinions of and feedback from customers and various stakeholders are an important part of the management system of the Environmental Board. Regular meetings with major partners, e.g. Estonian Council of Environmental NGOs, advisory council of customers, other public authorities, local municipality governments, and sectoral unions (Estonian Waste Management Association, Estonian Water Works Association) associations are organized to consolidate discussions and opinions. A customer feedback system in the form of an e-mail survey has been introduced. Results are analyzed and reports are available to the entire organization in the Intranet. The Environmental Board has set up an advisory council of customers comprised of representatives of entrepreneurs from different sectors who deal with the services of the Environmental Board on a day-to-day basis. This is an advisory body that discusses problems associated with the services of the Environmental Board and shapes joint standpoints regarding the development of services. Information about the advisory council and its minutes are available on the public web page<sup>2</sup>.

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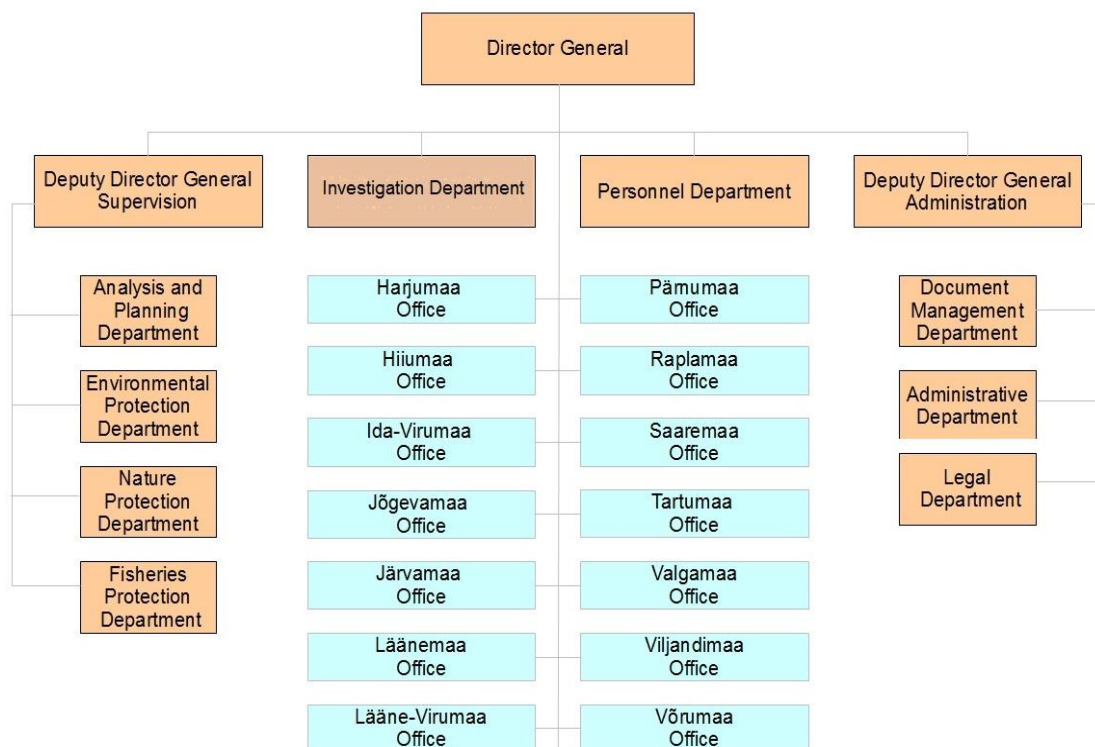
<sup>2</sup> <https://www.keskkonnaamet.ee/et/keskkonnaamet-kontakt/keskkonnaameti-tutvustus/kliendinoukoda>

### ***The Environmental Inspectorate***

Pursuant to the Environmental Supervision Act, environmental supervision in Estonia at the state level is executed by the Environmental Inspectorate. Environmental Inspectorate coordinates and executes supervision of all areas of environmental protection and the use of natural resources, as well as conducts proceedings in environmental violations.

Areas of supervision include: fisheries, forest protection, hunting requirements, protection of shores, classic nature protection, CITES (Washington Convention or Convention on International Trade in Endangered Species of Wild Fauna and Flora), extraction of mineral resources, waste management, protection of ambient air and ozone layer, protection of water, hazardous substances and chemical safety, radiation issues, integrated pollution control, maintenance and excavation works.

The structure of the Environmental Inspectorate is presented in Figure 3. As of January 1st 2016, the Inspectorate has a total 174 employees, 118 of them inspectors. At the local office level, there are 15 inspectors involved in radiation supervision (planned inspections, resolving complaints, misdemeanors). They also oversee adherence to the requirements of legislation for environmental protection in other fields.



**Figure 2.** Organizational structure of the Environmental Inspectorate.

The Environmental Inspectorate does not have inspectors who are involved solely in the radiation supervision (no radiation specialists). The environmental protection department has a chief inspector who deals with the coordination of the supervision activities, trainings, risk evaluation and quality management. To ensure the optimal use of Environmental Inspectorate human resources and to ensure the implementation of inspections, it is necessary to ensure specialization of dedicated inspectors to radiation safety area. The strategy plan of inspection has provisions to create a Radiation Safety Working Group of 4 inspectors and chief inspector

to focus on inspections of high and moderate risk facilities in 2019, and on small risk facilities in 2020. The strategy plan will be reviewed by 2020 and required changes will be incorporated as necessary.

The competence of inspectors is developed through training. Internal trainings take place on a regular basis (1-2 times a year) and are organized in cooperation with the Radiation Safety Department of the Environmental Board. Inspectors also have opportunity to participate IAEA training courses and workshops.

There have not been any changes in numbers of inspectors of radiation supervision in the last three years. As the Environmental Inspectorate executes supervision in all areas of environmental protection, there are no separate financial resources planned for radiation protection. The Environmental Inspectorate does not have special resources to carry out radiation surveillance. If necessary, external technical support is gained from the Radiation Safety Department of the Environmental Board.

Supervision results are publicly available. They are published in press releases, briefings and in the yearbooks of the Environmental Inspectorate. Information about the work schedule and supervision results can also be obtained upon request by contacting the Environmental Inspectorate.

## **Article 9. Responsibility of the license holder**

*Each Contracting Party shall ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant license and shall take the appropriate steps to ensure that each such license holder meets its responsibility.*

Estonia has no nuclear installations according to the definition of the Convention. As stated in the introduction of this Report, 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 and its amendment by the European Council Directive 2014/87/Euratom have been brought into the Estonian legislation in a general level. The following text describes the responsibilities of holder of radiation practice license in general. The few special requirements for nuclear installations, which exist in the Radiation Act, are also given.

On 6 July 2018 an amendment of the Radiation Act section 24<sup>1</sup> about liability of holders of radiation practice licenses entered in to force which states that holders of radiation practice licenses shall be liable for the performance of the obligations provided for in the Radiation Act and the terms and conditions of the license for the purposes of ensuring radiation safety and protection of employees in any exposure situations relating to any source of radiation in the possession of the holder of the license or any radiation practice of the holder of the license. Chapter 3 of the Radiation Act sets forth the obligations of the holder of a radiation practice license. According to the Section 32 of the Radiation Act, the holder of a radiation practice license is obligated to:

- 1) comply with the radiation safety principles;
- 2) ensure radiation safety and physical protection of the radiation sources in the holder's possession and to verify at least annually that the radiation source or the equipment containing thereof is present at the place of use or storage and in apparently good condition;
- 3) ensure the safety of the radiation source by correct installation and placement of the radiation source in the premises, mark the radiation source and the premises and use protective equipment;
- 4) keep records of every radiation source and radioactive waste for which the holder is responsible, the location and transfer thereof, take annual inventories of radiation sources and radioactive waste;
- 5) prepare the rules necessary for carrying out radiation works and instructing exposed workers and ensure updating of these rules upon commissioning of new technology or equipment;
- 6) organize medical examination of exposed workers;
- 7) ensure regular control and calibration of measuring instruments used and be responsible for their fitness for use and professional use thereof;
- 8) at the request of competent authorities, prove the legality of possession of radioactive substances or radiation apparatuses containing radioactive substances;
- 9) ascertain that the recipient has an appropriate radiation practice license before transfer of radiation sources;
- 10) recover radiation sources after the use thereof is terminated pursuant to the recovery plan submitted in the application for the license;
- 11) ensure that radioactive waste is managed in such a manner that the estimated harmful effect on future generations will not exceed the effect permitted by this Act or legislation established on the basis thereof;
- 12) cover all expenses incurred in radioactive waste management;
- 13) ensure that the activity and quantities of generated radioactive waste and emissions are as low as possible;
- 14) alleviate the consequences of emergency exposure situations;

- 15) immediately inform the Environmental Board and the Emergency Centre of loss, theft or unauthorized use of radiation sources and of any incidents or accidents which took place during radiation practices and resulted in unintentional exposure of workers or members of the public;
- 16) control the integrity of radiation sources after each incident if it may have damaged the radiation source and, if necessary, inform the Environmental Board of this incident and the measures implemented;
- 17) during procurement procedures for radiation sources, prefer manufacturers who agree to include a clause in the contract of sale regarding return of the radiation source to the producer.

In addition upon high risk radiation practices, a holder of a radiation practice license is obliged to:

- 1) prepare a response plan to emergency exposure situations;
- 2) ensure that a recognized radiation expert has approved the design documentation of the facilities of radiation practices and the commissioning of new radiation sources.

The Section 38 of the Radiation Act lays down the obligations of the holder of a radiation practice license in case of a high-activity radiation source. In addition to the provisions of the Section 32 of the Radiation Act, in case of radiation practice related to high-activity radiation source the holder of a radiation practice license must:

- 1) ensure that written information is included with the radiation source which proves that the radiation source is identified by a unique number and includes photos of the source, container, transport packaging of the source and, if necessary, devices and equipment;
- 2) ensure that proper tests have been performed with the frequency determined by the issuer of the license in order to check and maintain the integrity of the radiation source;
- 3) return every disused source immediately after discontinuing the use thereof to the manufacturer, transfer it to another holder of a radiation practice license or to a radioactive waste management facility;
- 4) enter into a contract with manufacturer upon purchase of a radiation source according to which the manufacturer undertakes to take back the radiation source at the latest 15 years after the importation of the source if the activity of the source exceeds 10 MBq ten years after the importation thereof into the county.

The Section 40 of the Radiation Act determines the obligations of the holder of a radiation practice license when operating a nuclear facilities. In addition to the provisions of the Section 32 of the Radiation Act in case of radiation practice related to a nuclear facilities the holder of a radiation practice license must:

- 1) ensure implementation of nuclear safety measures and compliance with relevant requirements;
- 2) ensure that the workers and subcontractors of the nuclear facility comply with the nuclear safety culture and nuclear safety quality management system implemented at the nuclear facility on the basis of their official duties;
- 3) assess nuclear safety at the nuclear facility at least with the same frequency as provided for in the requirements of the radiation practice license.

To enhance radiation safety, the Radiation Act authorizes a possibility to establish additional requirements to a radiation practice license. According to the Section 98 of the Radiation Act the regulatory body has the right to demand financial collateral (hereinafter *collateral*) from the



applicant to ensure that the funds necessary for safe disposal of the radioactive source or waste are immediately available:

- 1) The issuer of radiation practice licenses may require that applicants for radiation practice licenses have collaterals to recover radioactive substances, equipment containing thereof and radioactive waste
- 2) The issuer of radiation practice licenses shall decide on the need for collateral within 20 days as of registration of an application for a radiation practice license or the amendment thereof. The importance of ensuring recovery of radioactive substances, equipment containing thereof or radioactive waste from the radiation safety point of view and the estimated cost of recovery shall be taken into account upon making the decision.
- 3) The collateral must be only intended for recovery of radioactive substances, equipment containing thereof and radioactive waste and it must be immediately realizable, if appropriate.
- 4) The amount of collateral shall be the estimated cost of recovery of radioactive substances, equipment containing thereof or radioactive waste on the basis of the data submitted by the applicant of a radiation practice license and it shall be determined by the issuer of the radiation practice license.
- 5) The availability of collateral shall be certified by a guarantee of an Estonian or international credit or financial institution accepted by the issuer of radiation practice licenses. The issuer of radiation practice licenses has the right to refuse to accept any issuer of guarantees if there are reasons to doubt the reliability of the guarantee issued by such issuer on the basis of the former activities, financial status or reputation of the issuer of the guarantee.
- 6) Collateral must be valid up to the end of the recovery of radioactive substances, equipment device containing thereof or radioactive waste.

The holders of the radiation practice license are subject to inspections by the Environmental Inspectorate and their practices may be suspended for a period until the requested corrective measures are implemented.

The verification of safety is carried out in the form of safety reviews and safety assessments as well as in the implementation of inspection programs carried out by the Environmental Inspectorate. Ultimately, any violation of the requirements of the Radiation Act and/or its provisions determined by a radiation practice license is punishable by fines. As a precondition for granting a radiation practice license, the Radiation Act requires that the applicant shall present a valid proof on the safe management of any radioactive waste, which may be generated. The 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 Radiation Act also provides for the responsibility of decontamination of the environment, if the radioactive material is released in such an extent that the resulting health or environmental hazard requires action. According to the Act, in utilization of natural resources containing radioactive materials, the responsible party shall ensure that radioactive waste do not pose any health or environmental hazard during the operations, including the final stages.

The Section 74 of the Radiation Act states the conditions of refusal in addition to the general cases provided for in the Section 52 of the General Part of the Environmental Code Act. The Environmental Board shall refuse to issue a radiation practice license, if:

- 1) the planned practice is not best practice for economic, social or other benefits with regard to potential health detriment caused by the radiation practice;

- 2) the practice for which the radiation practice license is applied involves or may involve a risk to national or international security;
- 3) the applicant for radiation practice license has no exposed workers with required professional training;
- 4) the location applied for radiation practice or other terms and conditions do not allow for compliance with radiation safety requirements;
- 5) the applicant for a radiation practice license does not prove the existence of the collateral in the amount and on the requirements determined by the issuer of radiation practice licenses.

The Section 77 of the Radiation Act states the conditions of revocation of radiation practice licenses in addition to the general cases provided for in the Section 62 of the General Part of the Environmental Code Act. Environmental Board shall revoke a radiation practice license, if:

- 1) the holder of a license does not ensure existence of a financial collateral;
- 2) the holder of a license has repeatedly failed to ensure compliance with radiation safety principles, obligations and the requirements provided for in the license involving a serious risk of radiation;
- 3) the holder of a license, its representatives or employees have purposefully and in bad faith prevented the Environmental Inspectorate and its representatives from controlling the practice of the holder of the license.

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 10. Priority to safety**

*Each Contracting Party shall take the appropriate steps to ensure that all organizations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety.*

Principal obligations of holders of radiation practice license include being responsible for radiation safety and guarantee the physical protection of the radiation sources in the holder's possession, also developing and implementing a radiation safety quality system. The Section 70 of the Radiation Act prescribes that an application for a practice license shall include the description of the radiation safety quality system, the performance of which is assessed by the Environmental Board in the licensing process. The Section 35 of the Radiation Act provide that the quality system of radiation safety shall include the following:

- 1) planned and systematic activities which objective is to ensure radiation safety;
- 2) analysis of duties, and skills required for and requirements for use of radiation sources which include, in particular, description of radiation practice, guidelines for radiation practice, workers' training procedure;
- 3) requirements for procurement, use and disuse of materials and equipment;
- 4) description of radiation safety procedures implemented during radiation practices;
- 5) procedure for controlling the functioning and improvement of the radiation safety quality management system.

A nuclear facility radiation safety quality management system covers in addition:

- 1) description of systematic activities conducted for the purpose of ensuring nuclear safety;
- 2) analysis of duties and requirements for competence required to operate nuclear facilities;
- 3) description of the control system for compliance with nuclear safety requirements;
- 4) plans for training and instructing the workers.

According to the Radiation Act, in the licensing procedure in addition to the description of the radiation safety quality system, the applicant shall present to the Environmental Board the radiation safety assessment, which gives an overview of the aspects of radiation practices, which are related to the protections of people and safety of radiation sources, including of the protective and safety measures used, and of the potentially assessed doses of exposed workers and members of the public both under normal working conditions and in the cases of accidental and existing exposure situations, to which data on measures adopted to ensure radiation safety are appended.

During inspections of the licensed practices, the Environmental Inspectorate checks the practical application of the quality systems.

In order to assure the quality of radioactivity analyses performed by the Environmental Board, the most important analysis procedures (gamma spectrometry, personal dosimetry, indoor radon measurements) have been accredited according to ISO standard 17025 "General requirements for the competence of testing and calibration laboratories". Quality assurance is described in detail the Quality Manual for the Laboratory of Radiation Safety Department of the Environmental Board.

## **Article 15. Radiation protection**

*Each contracting Party shall take the appropriate steps to ensure that in all operational states the radiation exposure to the workers and the public caused by a nuclear installation shall be kept as low as reasonably achievable and that no individual shall be exposed to radiation doses which exceed prescribed national dose limits.*

Fundamental principles of radiation safety that shall be adhered to by all licensees including possible operators of nuclear installations in the future are provided in the Chapter 1 Division 3 of the Radiation Act:

- 1) planned radiation practices have to be justified by proving that they are the best based on their economic, social or other benefits in relation to the potential health detriment they may cause. The justification of radiation practices shall be reviewed whenever new and important evidence about the efficacy or consequences of existing types of radiation practices is acquired.
- 2) any exposure shall be kept as low as reasonably achievable, taking into account the economic and social factors.
- 3) the sum of exposure doses shall not exceed the limits established on the basis of the Radiation Act. This requirement does not apply to medical exposures and emergency occupational exposures.

Regulation No 97 of the Government “Limits for effective doses of exposed workers and members of the public, and limits for equivalent doses of the lens of the eye, the skin and extremities” sets the following dose limits:

- 1) the annual limit for effective doses of exposed workers incurred from radiation practices is 20 millisieverts;
- 2) the annual limit for effective doses of apprentices or students at the age of 18 or older who use radiation sources during their studies is 20 millisieverts;
- 3) the annual limit for effective doses of apprentices or students between the ages 16–18 who use radiation sources during their studies is 6 millisieverts;
- 4) the annual limit for effective doses of members of the public incurred from radiation practices is 1 millisievert.

The annual limit for equivalent doses incurred from radiation practices for exposed worker and apprentices or students at the age of 18 or older who use radiation sources during their studies is:

- 1) 20 millisieverts for the lens of the eye or 100 millisieverts during any consecutive five years under the condition that annual doses do not exceed 50 millisieverts;
- 2) an average of 500 millisieverts for 1 cm<sup>2</sup> of the skin, not taking into account the actual surface area of the skin that has been exposed;
- 3) 500 mSv for extremities.

The annual limit for equivalent doses of apprentices or students between the ages 16–18 who use radiation sources during their studies is:

- 1) 15 mSv for the lens of the eye,
- 2) an average of 150 millisieverts for 1 cm<sup>2</sup> of the skin, not taking into account the actual surface area of the skin that has been exposed;
- 3) 150 mSv for extremities.

The annual limit for equivalent doses incurred from radiation practices of members of the public is 15 mSv for the lens of the eye and an average of 50 millisieverts for 1 cm<sup>2</sup> of the skin, not taking into account the actual surface area of the skin that has been exposed.

The Regulation No 97 of the Government also establishes the requirements for the protection of exposed workers during pregnancy and breastfeeding:

- 1) as soon as an exposed worker informs the holder of radiation practice license of her pregnancy, the holder of radiation practice license shall immediately implement measures to keep the equivalent doses of the fetus as low as possible which shall not exceed 1 millisievert during the remainder of the pregnancy;
- 2) as soon as an exposed worker informs the holder of radiation practice license that she is breastfeeding a child, the exposed worker must not be assigned to any work where radioactive contamination of her body or intake of radionuclides is possible.

The Section 32 of the Radiation Act lays down the basic principles of managing radioactive waste and emissions. The holder of a radiation practice license ensures the safe management of radioactive waste and emissions generated in the course of radiation practice and ensures that:

- 1) radioactive waste is managed in such a manner that the estimated harmful effect on future generations will not exceed the effect permitted by this Act or legislation established on the basis thereof;
- 2) covers all expenses incurred in radioactive waste management;
- 3) ensures that the activity and quantities of generated radioactive waste and emissions are as low as possible.

The Section 39 of the Radiation Act establishes in addition main obligations for holders of radiation practice licenses related to the radioactive waste according to which a holder of a radiation practice license is required:

- 1) ensure safety of the radioactive waste facilities during the entire of use thereof;
- 2) organize the management of radioactive waste if this is necessary for modifying the properties of the radioactive waste prior to the release thereof into the environment, or the conditioning and intermediate storage and final disposal thereof;
- 3) take into account other risks and various stages of generating radioactive waste and interaction of radioactive waste when planning activities and in the course of activities;
- 4) transfer radioactive waste to a final disposal facility for radioactive waste within five years from the generation thereof at the latest.

Based on the Subsection 62 (3) of the Radiation Act, the Regulation No 43 of the Minister of the Environment “Clearance levels for radioactive substances and items contaminated with radioactive substances resulting from radiation practices, and the requirements for their clearance, recycling and reuse” sets the clearance levels for radioactive substances resulting from radiation practices and conditions under which the said substances or contaminated materials can be released or discharged to the environment. The Regulation No 43 of the Minister of the Environment sets the general clearance levels, clearance levels for metal waste, clearance levels for buildings and for demolition of the buildings as well as annual activity limits of radionuclides for discharges, both in gaseous or liquid form, from a single location of radiation practice. Excretions of patients, whom radioactive substances have been administered for the purposes of diagnosis or treatment, are discharged into the sewerage without restriction.

According to the Regulation No 43 of the Minister of the Environment, for clearance of materials contaminated with radioactive substances or for discharges of radioactive substances

to the environment the licensee must submit an application to the regulatory body, the Environmental Board. The Environmental Board, based where relevant on the radiation safety assessment of qualified radiation expert, decides upon application that the release of radioactive substances or contaminated materials or discharge thereof is or is not an optimal course of action.

The Subsection 70 (1) of the Radiation Act requires that the applicant of the radiation practice license shall submit the data on radioactive waste or emissions generated during radiation practices, the management thereof and waste packaging compliance criteria and radioactive waste storage premises (if applicable) upon application. This includes data on mode of generation of waste and emissions; characterization of waste and emissions; methods of management of waste and emissions; modes of release of emissions into the environment; compliance criteria of radioactive waste packaging; procedures of registration, records and inventory of waste; physical protection measures of waste; procedures for the delivery of radioactive waste to intermediate storage or final disposal facility of radioactive waste. The content of the requirements are specified in the Section 9 of the Regulation No 60 of the Minister of the Environment. The Subsection 75 (1) of the Radiation Act states that the maximum quantities of radioactive emissions, and modes of release thereof into the environment shall be described in the radiation practice license (if applicable).

The Subsection of 70 (1) the Radiation Act requires that the applicant of the radiation practice license submits a radiation monitoring program and information of the equipment used for monitoring with its application. Further details are specified by the Section 15 of the Regulation No 60 of the Minister of the Environment: description of monitoring plan and monitoring methods; place for conducting workplace monitoring on a control and monitoring area, adjacent areas and time of monitoring; rules for registering and storing monitoring data; description of individual dosimetry, with the type and frequency of dosimetry; specification of radiation monitoring equipment and units of measure, type of equipment and data characterizing the equipment; the details about the monitoring program, monitoring methods and the characteristics of the used radiation monitoring equipment; which areas shall be monitored, the frequency of monitoring, what data shall be submitted and how the monitoring data shall be stored.

Radiation practices with significant environmental impact as defined in the Section 6 of the Environmental Impact Assessment and Environmental Management System Act, the following data will be submitted in addition: type of environmental sample; data on the monitoring location, including coordinates, location plan of environmental sampling; method of analysis, including measurable components and frequency of monitoring.

The Subsection 75 (1) of the Radiation Act states that the requirements on radiation monitoring shall be described in the radiation practice license. The frequency of submitting monitoring data to the Environmental Board is also established in the license.

Safety of all radiation practices is continuously supervised by the Environmental Inspectorate in cooperation with the Environmental Board according to the annual inspection plan. Results of these inspections and of the performed safety assessments are documented and reviewed by the regulatory bodies.

The Environmental Board is responsible for maintaining the registries related to radiation safety (state register of the doses of exposed workers; register of the radiation sources and nuclear

material, register of the radioactive waste). The register of the radiation sources and nuclear material is discussed in Article 7 in this Report. The basic obligation of holder of the radiation practice license is to ensure monitoring of the doses of radiation workers and submission of their data to the dose register. The monitoring of personal doses must be performed only by approved dosimetry laboratories. Pursuant to the Radiation Act, the Environmental Board maintains a national dose register for exposed workers and issues dose cards for the outside workers. The dose register is in use since 1999. The national dose register of exposed workers is established and managed accordance with the Regulation No 41 of Minister of the Environment “Establishment of the National Dose Register of Exposed Workers and its Statute”. A locally developed database is used which includes all the relevant information. As the current electronic platform for national dose register is outdated, it is planned to modernize the national registry by 2021.

One of the sub-programmes of the national environmental monitoring programme is the radiation monitoring, which is the responsibility of the Environmental Board. The Environmental Board composes, maintains and implements the radiation monitoring programme. The requirements for conducting radiation monitoring are described in the Radiation Act, the Environmental Monitoring Act, and their regulations. In the framework of radiation monitoring, air samples, surface water, drinking water, milk, food and soil are collected and analyzed on an annual basis and the dose rate of gamma radiation in the air is monitored continuously. As Estonia has acceded to the Convention for the Protection of the Marine Environment of the Baltic Sea, samples of the marine environment (seawater, biota and sediments) are also collected and analyzed. The monitoring results are made publicly available on the website of the Environmental Board. There are 15 automated air radiation monitoring stations, 3 air filter facilities, the Environmental Board's laboratory for sample analysis, a mobile metering laboratory and cooperation between authorities for sample collection. Environmental Board participates in international cooperation and exchanges the data on radiation monitoring.

## **Article 16. Emergency preparedness**

*1. Each Contracting Party shall take the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency. For any new nuclear installation, such plans shall be prepared and tested before it commences operation above a low power level agreed by the regulatory body.*

*2. Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.*

*3. Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency.*

The national legal framework for emergency preparedness, including nuclear and radiological emergency, is based on the Emergency Act. A number of regulations specifying important requirements of the Act have been passed by the Government and by the Minister of the Interior. The Estonian emergency preparedness system is coordinated by and under the responsibility of the Minister of the Interior.

The Emergency Act provides the legal basis for crisis management, including preparing for emergencies and responding to emergencies as well as ensuring the continuity of vital services. The Emergency Act also governs the declaration, resolution and termination of an emergency situation, the involvement of the Defense Forces and the Defense League in resolving an emergency that has led to the declaration of an emergency situation, and state supervision and liability.

Chapter 2 of the Act provides that the Government of the Republic forms a permanent Crisis Management Committee of the Government of the Republic.

Organization of preventing, preparing and resolving emergencies (Chapter 3), shall include risk assessments of possible emergencies. The authority in charge shall assess together with the authorities involved in the preparation of a risk assessment whether the risk assessment is up to date on a regular basis, but not less than once every three years and, if necessary, shall improve the risk assessment. Chapter 3 also describes requirements on preparation of emergency response plans and crisis management exercises. The detailed procedures and requirements are described in Regulation No 30 of the Minister of the Interior “Requirements and procedure for the preparation of Emergency Response Plan”.

Chapter 4 specifies the response to the emergencies: informing the public and media, basis and conditions and procedure of declaring an emergency situation. Subdivision 1 of the Chapter establishes procedures for changing the conditions and the termination of emergency situation. Subdivision 2 of the Chapter 4 specifies the persons in charge of emergency situation with their duties and rights. Subdivision 3 of the Chapter 4 provides measures implemented during emergency situations, including obligation to work, expropriation of movable property, duty of grant use of items, procedure for expropriation or taking things into duty of grant use, entry into property, prohibition of stay and other restrictions of freedom of movement, restrictions on holding public meetings and public events, isolation and treatment of people with infectious diseases during emergency situations, infectious animal disease control and responsibilities of the Police in ensuring these measures. Subdivision 4 of the Chapter 4 details the use of the



Defense Forces and Defense League in responding to emergencies, in rescue work and ensuring security.

Chapter 5 provides the list of vital services and authorities organizing continuity thereof and organizing of their continuous operation.

Chapter 6 provides conditions of compensating damages and compensations incurred during emergency situations to persons.

Provisions of supervisory control over compliance with the Emergency Act and legal acts issued on the basis thereof and the liabilities in the case of violations of the requirements and obligations are presented in Chapter 7 of this Act.

The Radiation Act provides more specific provisions of intervention needed in the case of a radiological emergency or an existing exposure situation. Safety principles are provided in the Chapter 8 of the Radiation Act: the implementation of intervention shall be justified so that the reduction in detriment caused by radiation outweighs the harm and costs of the intervention and also shall be optimized in form, scale and duration. Intervention levels and action levels, and reference levels for emergency occupational exposure situation, which constitute the basis for preparation of the national crisis management plan for responding to a radiological emergency and implementation of measures for protecting the public are provided by the Regulation No 95 of the Government “Intervention and action levels and reference levels of emergency exposure”, which has been issued pursuant to the Radiation Act. It describes safety criteria to the public and emergency workers. For emergency workers, it clearly describes reference levels and requirements notifying emergency workers about possible risks and dangers to worker health during an intervention. Based on the Radiation Act participants in the intervention are the Rescue Board on the basis of and pursuant to the procedure provided for in the Rescue Act, the Police and Border Guard Board on the basis of and pursuant to the procedure provided for in the Police and Border Guard Act, the Environmental Board, the manager of radioactive waste participating in the intervention and, as appropriate, any other persons. In the case of intervention, the Environmental Board may apply special state supervision measures provided in the Law Enforcement Act (conditions for entry into premises, conditions for examination of premises) on the bases of and pursuant to the procedure provided for in this Act. Managers of radioactive waste who participate in intervention are legal persons holding a radiation practice license for management of a radioactive waste storage facilities and transportation of radioactive substances and have capability for removal of contamination from radioactively contaminated areas. The manager of radioactive waste involved in intervention is national radioactive waste management company A.L.A.R.A. Ltd, which reports to the Ministry of Economic Affairs and Communications.

According to Regulation No 63 of the Government “Emergency situations for which a contingency plan is to be drawn up and for which a risk communication is to be carried out and the authorities responsible for the management of emergencies” issued pursuant to the Emergency Act, Environmental Board directs and resolves radiological and nuclear emergencies since July 2018. The Environmental Board has developed the risk assessment of the radiological emergencies. The risk assessment includes assessment of the types of radiological event that could cause an emergency and a risk matrix to assess the likelihood and severity of these events. The radiological emergencies were identified. Those are the radiological accident in a neighbouring country and a national radiological accident, for which the Environmental Board has drawn up the radiological emergency response plan. To ensure safety during intervention the emergency response plan describes following issues like organization of response to radiological emergency, management structure of response to emergency, duties of institutions and persons participating in response to radiological

emergency, organization of notification of public, organization of international cooperation upon responding to radiological emergency, resources, etc. Updating and reviewing emergency response plan is described in Regulation No 30 of the Minister of Interior “Requirements and procedure for the preparation of Emergency Response Plan”. The authority in charge with authorities and persons involved in the solving of the emergency, will assess the operations and timeliness of the plan at least once every two years and after each emergency for six months or if necessary, shall improve the plan any time necessary or required. National Radiological Emergency Response Plan is a draft and currently in process of coordination with relevant authorities. The approval of National Radiological Emergency Response Plan is expected in 2019.

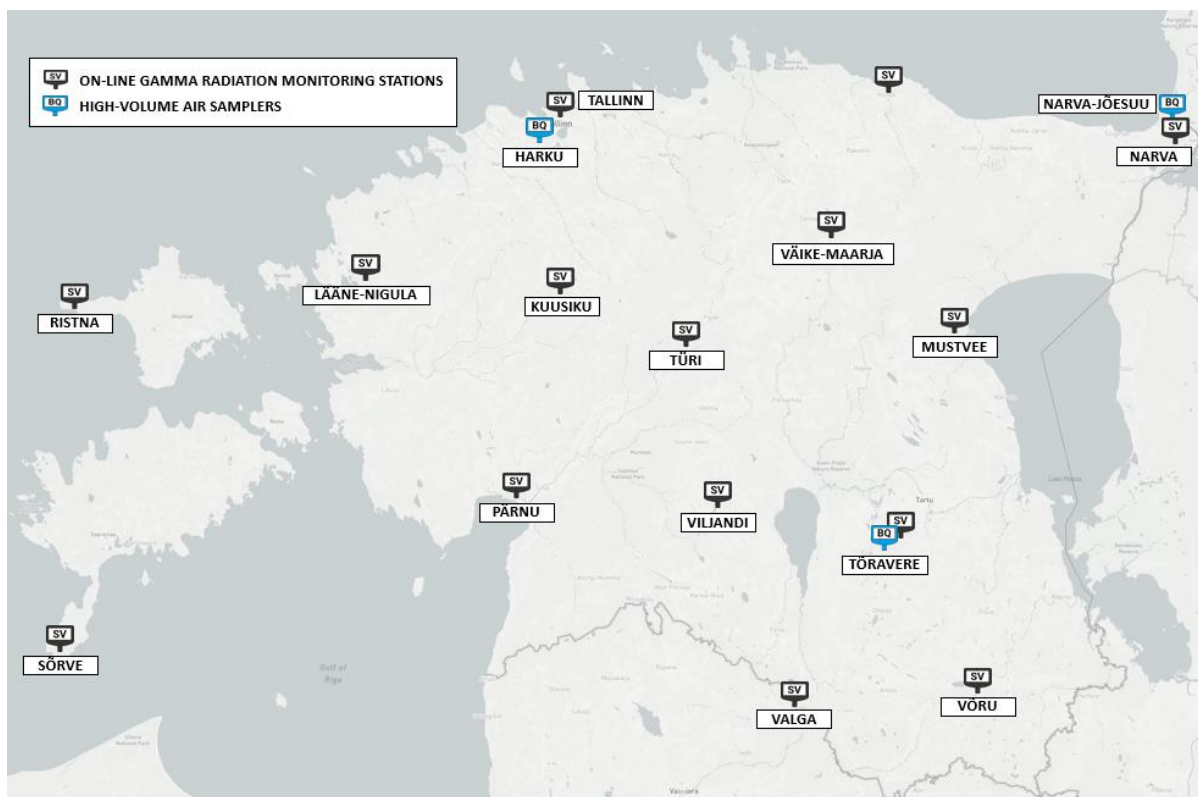
Pursuant to the Radiation Act, one of the main obligations of the holder of the licence is to prepare an emergency plan and the Environmental Board reviews the emergency response plans during authorisation process. Upon radiation practices with high risk, a holder of the licence is obliged to prepare a response plan to accidental exposure situations that based on the assessment of potential exposures. In the Section 18 of the Regulation No 60 of the Minister of the Environment the content of the emergency response plan is described, which is following:

- 1) brief description of the radiation source;
- 2) description of potential emergency exposure situations and the consequences thereof;
- 3) name and contact details of the manager responsible for emergency response;
- 4) description of actions to deal with emergency;
- 5) information on the equipment and resources necessary for emergency response;
- 6) procedure for notifying the Environmental Board, the Rescue Board, workers and the public;
- 7) description of organisation of cooperation with other enterprises and institutions;
- 8) frequency of reviewing the emergency response plan.

The Environmental Board evaluates the emergency response plans, trainings and exercises during the pre-authorization inspection based on the documentation provided by the applicant. By granting the radiation practice licence the Environmental Board also approves the emergency response plan. The Environmental Board is notified according to the on-site emergency response plan during the exercises. The Environmental Board may also be involved in the on-site emergency response plan testing. According to the Radiation Act, the holder of the licence must immediately inform the Environmental Board and the Emergency Centre of loss, theft or unauthorised use of radiation sources and of any incidents or accidents, which took place during radiation practices, and resulted in unintentional exposure of workers or members of the public. Responsibility of licensees specified by the Radiation Act also includes preventing or reducing the release of radioactive material and exposure of workers and the public.

According to the Section 111 of the Radiation Act the Environmental Board shall ensure the operation of the radiation hazard early notification system. Early warning in case of a radiological emergency in Estonia or at a nuclear facility in the vicinity of Estonia is based on the international agreements on exchange of information and on the bilateral agreements. The Environmental Board has a bilateral agreement with STUK, Finland for cooperation and information exchange in case of radiological and nuclear emergency and response since May 2019. Estonia is a Contracting Party to the International Convention on Early Notification of a Nuclear Accident and to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

As a supplement to the early warning agreements, Estonian on-line system for automatic monitoring of radioactivity is in service 24 hours a day. The system consists of gamma monitoring stations, placed strategically in the country (see Figure 3).



**Figure 3.** On-line automatic gamma dose-rate monitoring stations and high-volume air samplers in Estonia.

There are 15 automated air radiation monitoring stations and 3 air filter facilities.

All the radiation monitoring stations have a Geiger-Müller type detector for gamma dose rate monitoring and a NaI(Tl) gamma detector for spectrometric measurements. The Environmental Board collects automatically the data from the stations. Any increase in the gamma radiation dose-rate level attributed to causes other than a natural increase of the radon content in air, initiates an alarm by the computer server and a notification of the officer of the Environmental Board on a 24/7 duty. The data from all the monitoring stations (dose rates averaged over 10-minute) are stored in the server installed in the Information Technology Centre of the Ministry of the Environment. Three high-volume air samplers with aerosol filters are continuously operating in Narva-Jõesuu, Tallinn-Harku and Tartu-Tõravere (see Figure 3). The weekly filters with deposited radioactivity from these stations are analyzed by the laboratory of the Environmental Board to determine the radionuclide content in the out-door air.

The Decision Support System ARGOS has been in use in Estonia since 2005. The Danish Emergency Management Agency (DEMA) in association with the Prolog Development Centre Inc. originally developed ARGOS. An international consortium now manages the ongoing development and maintenance of the ARGOS system, where the Environmental Board is a member. The system is regularly updated, so that any lesson learned from exercises or from uses in emergency can be incorporated into operational systems. The data with analyses and simulations may be used for decision-making (e.g. planning emergency related environmental monitoring) and management support in nuclear emergency situations. The ARGOS system allows viewing prognostic, measured radiation, agricultural and meteorological data overlaid

in a geographic information system. Results of ARGOS simulations of possible accidents in NPPs of neighboring countries, in addition to analysis of the practices of other countries, have been taken into account in decision-making on strategic aspects of preparedness, for example on the need of State reserve of iodine tablets (our current decision is not to have the State reserve).

Estonian authorities regularly participate in the international exercises, such as those coordinated by the IAEA or European Commission (ECURIE). On the regional scale, the Council of Baltic Sea States has its own agreements about the information exchange in the case of emergency. During period 2016-2019 following exercises are taken place:

- 1) On April 12-13, 2016 an international ARGOS user group meeting took place in Tallinn, Estonia. An exercise was held on using ARGOS during an imaginary nuclear accident in Leningrad NPP. Aim of this exercise was to test, if same given scenario gives similar outcomes and that was achieved.
- 2) On April 17, 2017 full scale national table-top exercise BOREX was carried out. Its scenario was about severe accident at Nuclear Power Plant about 80 km from Estonian border. Two days lasting exercise included most national authorities and national crisis committee;
- 3) During 2018-2019 there has been two exercises, which took place at Estonian border and included organizational intervention in case of illegal transport of radioactive materials crossing Estonian border. As a results, plans and procedures were reviewed.

Early notification of a nuclear accident occurring abroad is received in Estonia via the ECURIE system of the European Council or the IAEA USIE notification system or both. The Environmental Board is the National Warning Point and the National Competent Authority in Estonia for any situation, which might result in an actual or potential deterioration of radiation safety of the population, environment or society. In order to immediately notify, advice and/or consult the local and governmental authorities on the needed emergency response actions, an expert of the Environmental Board is on duty for 24 hours a day. The communication systems and the arrangements for transfer of early notifications are tested regularly. One part of the system (automatic gamma station network) is checked by automatic checker by server and also overviewed and tested by the users. ARGOS system is checked by the users at least few times per week. Once in a year systems sustainability is checked by one bigger test/exercise by the end-users and IT department. Scenario is to stress-test all the functions and their workability from outside of the office (blackout situation). The Environmental Board participates actively in the communication exercises organized by the IAEA IEC.

In order to ensure that people know how to behave in emergency situations, members of the public must be informed of the risks that may cause the crisis, the possible consequences. The risk communication for radiological emergencies was appointed to the Environmental Board by the Government in 2018. A study by the Rescue Board in 2017 showed that residents' awareness of potential emergencies and their willingness to handle them independently is low. In 2018 the Ministry of the Interior in cooperation with State Chancellery published a document "Code of Conduct for Crisis Situations", which gives main instructions to public how to prepare for and act during different crisis situations, including radiological accidents<sup>3</sup>. To raise public awareness, the more information is published in the websites of authorities in charge on management of response to respective emergency situations. Environmental Board is published

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<sup>3</sup> <https://kriis.ee/en/preparing-for-crisis-situations/preparing-for-crisis-situations-together-with-your-family-and-community/>

information related to a radiological emergency in its website and continues further improvement of guiding materials.

The IRRS follow-up mission in 2019 considered improvements made in implementing the recommendations in area of emergency preparedness since 2016. As of one recommendation made open from three, additional works must be done to adopt requirements essential for appropriate emergency preparedness planning and response. On the completion of the recommendation, it is foreseen to update National Radiological Emergency Response Plan and respective regulations, which activities are described in NRSDP 2018-2027.

## Chapter 3 Summary

In the above, the implementation of the obligations of the Convention, Articles 7, 8, 9, 10, 15 and 16 is evaluated. Based on the evaluation it can be concluded that the relevant Estonian regulations and practices continue to be in compliance with the obligations of the Convention. The main developments since the 4<sup>th</sup> National Report in 2016 relevant to the Convention are the following:

- 1) hosting the IRRS mission in 2016, and IRRS follow-up mission and ARTEMIS mission in 2019;
- 2) new Radiation Act enter into force on 1 November 2016, and new secondary legislation is established.
- 3) Amendment of the Radiation Act and its regulations in 2017 and 2018 due to the transposition of Council Directive 2014/87/EURATOM of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations, 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, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom as well as to implement the 2016 IRRS mission findings;
- 4) since first half of 2018 the online system, Information System for Environmental Decisions, is in use to facilitate and simplify the application for and the processing of radiation practice licenses, the performance of monitoring, reporting duties and other duties related to the license as well as the retention, use and availability of collected data and to maintain the register of the radiation sources and nuclear material;
- 5) since July 2018 the Environmental Board is the authority in charge on management to response to radiological emergencies;
- 6) in 2017, Estonian Government approved the “National Development Plan of the Energy Sector until 2030”, which does not foresee use of nuclear energy in Estonia.

Estonia hosted the IRRS mission in 2016 and IRRS follow-up mission in 2019. IAEA IRRS follow-up mission in 2019 concluded that since 2016 Estonia has taken positive steps to:

- 1) establish a policy and strategy for safety;
- 2) clearly delineate the responsibilities between the Health Board and Environmental Board regarding inspection of medical facilities;
- 3) develop guidance documents for review and assessment of applications for authorization, inspection and enforcement, including for verification of certificates of transport package designs;
- 4) establish a mechanism for information sharing between the Environmental Board and the Environmental Inspectorate in carrying out their regulatory functions;
- 5) apply graded approach in the authorization process;
- 6) develop enforcement policy and criteria for enforcement actions;
- 7) update the regulatory framework for medical, occupational and public exposure for consistency with IAEA safety standards;

IAEA IRRS follow-up mission identified areas including new findings warranting attention or need improvement that would enhance the legal and regulatory framework for radiation safety in Estonia. Further actions needs to take to:

- 1) establish an integrated management system for the Environmental Inspectorate;
- 2) consider to ensure that there is a sustainable provision of education and training in radiation safety;

3) consider to include provisions on leadership for safety in the Integrated Management System in order to foster and sustain a strong safety culture.

Although most of the recommendations and proposals made during IAEA IRRS mission in 2016 have been incorporated into the Radiation Act, some of them still need more thorough analysis and time to develop, and those are reflected in NRSDP 2018-2027.

Concerning training of the staff of regulatory body, the 2016 IRRS mission made a recommendation for improvement: the Environmental Board and Environmental Inspectorate should develop and implement a human resource plan to ensure the availability and competence of staff involved in regulatory functions. 2019 IAEA IRRS follow-up mission concluded that Estonia needs to consider to ensure that there is a sustainable provision of education and training in radiation safety. For implementation this recommendation is incorporated into NRSDP 2018-2028. Due to the fact that the responsibilities of authorities involved in ensuring radiation safety are different, the levels of knowledge required by the staff of these bodies may be defined differently. In Estonia, there are no training courses on specific radiation topics for employees of regulators. Mostly the Environmental Board provides the training upon request for other government institutions. The training provides basic requirements on radiation safety and protection including some practical exercise such as the measurement of radiation level. The training provided under the IAEA Technical Cooperation will be used to alleviate the problem. However, the number of participants in the training is limited, which means that not all staff with training needs can participate in the training. At the same time, there are few resources to send a staff member to the training, who will continue to train others when they return, because the relevant training is expensive and the opportunities offered by the IAEA do not always match national needs. The NRSDP 2018-2027 has identified the need for online course called "Introduction to Radiation Protection". The design of the E-Learning module could be based, for example, on the IAEA CONNECT platform. Given that radiation safety knowledge is relatively difficult to obtain in Estonia in the course of education, this means that, in normal circumstances, a person occupying a position related to radiation is often without specific sectoral knowledge. Although there is an opportunity to take advantage of international training opportunities, it would be necessary to ensure the introduction of the subject in the mother tongue. The advantage of the online course is that it can be completed as soon as you get to a new job. As the number of people in need of a course is low and varies from year to year, it is appropriate to use the online course in particular for training. It would be expedient to provide the person responsible for the course to check at least once a year the timeliness of the information provided and also to assist those who have completed the course, if necessary. The E-Learning module on introduction to radiation protection is planned to be developed by 2027 starting with development in 2020.

### ***Challenges identified by the Contracting Parties in 7<sup>th</sup> Review Meeting in 2017 and their status by 2019***

Challenge 1: Implementation of the NRSDP 2018-2027, including the relevant IRRS findings related to appropriate steps for the preparation and testing of emergency plans - This challenge is on implementation.

The new NRSDP covering the period 2018-2027 is a draft and has 3 annexes (includes sectoral sub-plans), which are National Programme for Radioactive Waste Management, National Radon Action Plan and the Action Plan for Implementing the NRSDP. The strategic environmental assessment is launched and final version of the NRSDP draft is currently in the phase of public display. After coordinating the updated version of the NRSDP together with its

annexes with relevant authorities and stakeholders, it is approved by the Minister of the Environment by a Decree and made publicly available. The formal approval is expected by October 2019. The Action Plan for Implementing the NRSDP is established for 4 year period for 2018-2021. The second Action Plan for Implementing the NRSDP shall be established for another 4 year for 2022-2025 and the third on for the 2-years period of 2026-2027.

Challenge 2: Relevant training of the staff remains a challenge - This challenge is on implementation.

The new NRSDP covering the period 2018-2027 includes activities to improve the situation to train staff of authorities involved in ensuring radiation safety. The NRSDP 2018-2027 foresees to develop online course called “Introduction to Radiation Protection”. The E-Learning module on introduction to radiation protection is planned to be developed by 2027.

***Suggestions identified by the Contracting Parties in 7<sup>th</sup> Review Meeting in 2017 and their status by 2019***

Suggestion 1: Ensuring that Estonia has cooperation agreements related to emergency preparedness and response with its neighboring countries – This suggestion has been implemented.

On 24 May 2019 the Environmental Board of Estonia and Radiation and Nuclear Safety Authority of Finland (STUK) signed the Memorandum of Understanding for Cooperation and Exchange of Information on Radiation and Nuclear Safety and Regulatory Matters.

***Planned activities to improve safety***

As Estonia has no nuclear installations according to the Convention of Nuclear Safety, the main issue is to improve of emergency preparedness. The National Radiation Safety Development (NRSDP) is the basis for future planning in the field of radiation protection and nuclear safety. The general objective of the NRSDP is ensuring high level of radiation safety, and it lists and details the strategic objectives, which overlap with the objectives of the Convention. The strategic objectives are the following:

- 1) creation of the optimized radiation safety ensuring system in the country;
- 2) suppression of hazards associated with radioactive waste and its management;
- 3) improve emergency preparedness;
- 4) reduce risks from natural radiation sources and to raise awareness amongst the Estonian public of radiation-related issues;
- 5) optimize the use of radiation in medicine.

The main planned activities are the approval of the NRSDP 2018-2027 by the Minister of the Environment is expected by October 2019 and the National Radiological Emergency Response Plan is expected by the end of 2019. Several activities will follow to implement the NRSDP 2018-2027, *inter alia*:

- 1) the development of an online e-learning training course “Introduction to Radiation Protection” for regulatory authorities starting in 2020;
- 2) to update the web-based information materials for the members of the public on how to act in case of radiological emergency;
- 3) modernization of the national registry for exposed workers by 2021.



## Chapter 4 Annexes

### Annex A. Shut-down submarine nuclear reactors in Paldiski site

The site of the former USSR nuclear submarine training centre is located in Paldiski, North Estonia. It is currently in the process of decommissioning. The nuclear facility in Paldiski was established in the early 1960' for training the USSR navy personnel for the operation of submarine nuclear reactor systems. Two full-sized PWR type reactors were installed in the submarine mock-ups in a large building. The reactors were close analogues of those operated on real nuclear submarines of the Echo and Delta classes. Operating nuclear propulsion systems with the complete power transmission to propeller shafts and the corresponding hydraulic brake systems have been used as the training stands. The first-generation 70 MWth reactor was commissioned in 1968. The reactor was in operation during about 20,000 h until January 1989. In 1983 the 90 MWth PWR reactor was commissioned. This reactor was in operation for about 5,300 h until December 1989. Table A1 presents main available data of the reactors.

**Table 1. Characteristics of the submarine nuclear reactors in Paldiski.**

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	7.5 m	9.5 m
- length	~ 50 m	~ 50 m

In 1994 the reactors were defuelled and the spent nuclear fuel was shipped to Russia. Non-radioactive components of the training stands were dismantled, hull sections housing reactor vessels with their primary circuits, auxiliary equipment and some additional waste were partly grouted, seal-welded and enclosed into concrete sarcophagi. In 1995 the ownership and control of the site were officially transferred to Estonia. Since then the work on monitoring, dismantling, decommissioning, decontamination and dismantling of the Paldiski facilities is in progress. Site is under administration of the Estonian Radioactive Waste Management Agency A.L.A.R.A. Ltd. In 1997 A.L.A.R.A. Ltd established at the site a centralized interim storage for both D&D and institutional radioactive waste. During the period 1995-2011, a number of activities have been undertaken on the site to guarantee the safe storage of the reactor compartments until 2040. By that time, Estonia should have radioactive waste disposal facilities available, which could accommodate waste arising from decommissioning of the reactor compartments. Related to the decommissioning of reactor compartments feasibility studies has been carried out in 2014-2015. Preferable option for decommissioning is full dismantling (without cutting of reactor vessel) with cutting into small pieces and fitting waste in standard concrete containers. Arising waste volume will be around 1000 m<sup>3</sup> conditioned low and intermediate level waste.

## **Annex B. References to national legislation**

Estonian legislation on radiation and nuclear safety is listed below, as in force on 30 July 2019. The legislative acts are available through an electronic database “Riigi Teataja” – The State Gazette: [www.riigiteataja.ee](http://www.riigiteataja.ee) (the Acts are available in English).

### **1. Acts**

- 1.1. Radiation Act, passed on 8 June 2016, as last amended on 26 June 2018.
- 1.2. General Part of the Environmental Code Act, passed on 16 February 2011, entry into force 01.08.2014, in part 01.01.2015 and 01.08.2017, as last amended on 22 February 2019
- 1.3. Administrative Procedure Act, passed on 6 June 2001, as last amended on 13 March 2019
- 1.4. Environmental Impact Assessment and Environmental Management System Act, passed on 22 February 2005, as last amended on 12 December 2018
- 1.5. Emergency Act, passed on 8 February 2017, as last amended on 22 May 2018
- 1.6. Law Enforcement Act, passed on 23 February 2011, as last amended on 13 March 2019
- 1.7. Code of Misdemeanour Procedure, passed on 22 May 2002, as last amended on 13 March 2019
- 1.8. Environmental Monitoring Act, passed on 4 July 2016, as last amended on 22 December 2018
- 1.9. Penal Code, passed on 6 June 2001, as last amended on 1 July 2019

### **2. Regulations of the Government of the Republic**

- 2.1. Regulation No 96 of 15 September 2016: The Bases for Calculation of Exemption Values, and the Exemption Values for Radionuclides
- 2.2. Regulation No 97 of 15 September 2016, as last amended 31 July 2018: Effective Dose and Equivalent Dose Limits for the Lens of the Eyes, Skin and Extremities for Exposed Workers and Members of the Public
- 2.3. Regulation No 95 of 15 September 2016, as last amended 31 July 2018: Intervention and action levels and reference levels of emergency exposure
- 2.4. Regulation No 63 of 26 July 2018: Emergency situations for which a contingency plan is to be drawn up and for which a risk communication is to be carried out and the authorities responsible for the management of emergencies
- 2.5. Regulation No 108 of 22 June 2017: List of events that could lead to an emergency and that are subject to a risk assessment and the authorities in charge of preparing an emergency risk assessment.

### **3. Regulations of the Minister of the Environment**

- 3.1. Regulation No 13 of 20 May 2014, as last amended on 26 February 2018: Statute of the Environmental Board
- 3.2. Regulation No 12 of 31 March 2008, as last amended on 5 July 2019: Statute of the Environmental Board
- 3.3. Regulation No 60 of 24 November 2016, as last amended on 6 February 2019: “Detailed requirements for applications for radiation practice licenses, lists of data of applications and radiation practice licenses, and lists of data characterizing radiation sources used to keep lists of nuclear materials.
- 3.4. Regulation No 57 of 24 November 2016: Requirements for radiation safety training of radiation safety specialists and exposed workers.
- 3.5. Regulation No 28 of 6 September 2016: The Requirements for the Results of Individual Monitoring of Outside Workers, and for Formalizing Such Results, and for the Standard Format for the Dose Chart of Outside Workers.

- 3.6.Regulation No 52 of 16 November 2016: Requirements for the premises where radiation sources are located, for marking the premises and radiation sources, categories of radioactive sources and radionuclide activity levels.
- 3.7.Regulation No 45 of 27 October 2016: The curriculum for training of radiation experts, their professional skills requirements, the procedure for application for the certificate and the standard format of applications and certificates.
- 3.8.Regulation No 34 of 4 October 2016: The Classification of Radioactive Waste, the Requirements for Registration, Management and Delivery of Radioactive Waste and the Acceptance Criteria for Radioactive Waste.
- 3.9.Regulation No 43 of 27 October 2016: Clearance Levels for Radioactive Substances and Materials Contaminated with Radioactive Substances Resulting from Radiation Practices, and the Requirements for Their Clearance, Recycling and Reuse.
- 3.10. Regulation No 54 of 18 November 2016: 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
- 3.11. Regulation No 41 of 20 October 2016: Establishment of the National Dose Register of Exposed Workers and its Statute.
- 3.12. Regulation No 28 of 30 July 2018: The reference levels for indoor radon concentrations in workrooms, the procedure for radon measurements and obligations of employers at workplaces with an increased radon risk.
- 3.13. Regulation No 20 of 29 June 2017, as last amended on 27 February 2019: The environmental decisions information system and its statutes.
- 3.14. Regulation No 27 of 6 September 2016: The List of Paid Services and Rates of Fee of the Environmental Board.
- 3.15. Regulation No 33 of 3 October 2016: Specifications of the procedure for processing the documents for the import, export or transit of radioactive waste and the time limits thereof based on the countries of origin and destination.
- 3.16. Regulation No 46 of 4 November 2016: Establishment of the object inspection database system and its statutes.

#### **4. Regulations of the Minister of the Interior**

- 4.1.Regulation No 30 of the 21 June 2017: The requirements and procedure for the preparation of Emergency Response Plan.
- 4.2.Regulation No 28 of the 19 June 2017: The requirements for an emergency risk assessment and the procedure for the preparation of a risk assessment

#### **5. Regulations of the Minister of the Social Affairs**

- 5.1.Regulation No 71 of 19 December 2018, as last amended on 12 March 2019: Radiation safety requirements for medical radiological procedures, clinical audit requirements for medical radiological procedures, and diagnostic reference levels and requirements for determination thereof.

## **Annex C. References to national reports and other documents**

1. Convention on Nuclear Safety. 4th 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. Environmental Board. Tallinn, Estonia, August 2016.
2. International Atomic Energy Agency. Integrated Regulatory Review Service (IRRS) Mission to Estonia. IAEA-2016.
3. International Atomic Energy Agency. Integrated Regulatory Review Service (IRRS) Follow-Up Mission to Estonia. IAEA-2019.
4. International Atomic Energy Agency. Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation (ARTEMIS) Mission to Estonia. IAEA-2019.
5. Ministry of the Environment. National Radiation Safety Development Plan 2008-2017, Tallinn, 2008.
6. Ministry of the Environment. National Programme for Radioactive Waste Management. Tallinn, 2015.
7. Ministry of the Economic Affairs and Communications. National Development Plan of the Energy Sector until 2030, Tallinn, 2017.
8. Preliminary Studies for the Decommissioning of the Reactor Compartments of the Former Paldiski Military Nuclear Site and for the Establishment of a Radioactive Waste Repository. Final Report. 2015
9. The Ministry of the Interior and the Government Office of Estonia. Code of Conduct for Crisis Situations. Tallinn, 2018

## Annex D. Compilation of Treaties signed by Estonia

### *Multilateral Agreements*

No.	Title	In Force	Status
1.	Agreement on the Privileges and Immunities of the IAEA	1992-02-12	acceptance: 1992-02-12
2.	Treaty on the Non-Proliferation of Nuclear Weapons	1992-01-07	Accession: 1992-01-07
3.	Comprehensive Nuclear-Test-Ban Treaty	Not yet	Signature: 1996-11-20 Ratification: 1999-08-13
4.	Convention on Environmental Impact Assessment in a Transboundary Context	2001-07-24	Ratification: 2001-04-25
5.	Amendment to the Convention on Environmental Impact Assessment in a Transboundary Context	2014-08-26	Ratification: 2010-04-12
6.	Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context	2010-07-11	Ratification: 2010-04-12
7.	Amendment to the Convention on Environmental Impact Assessment in a Transboundary Context	2017-10-23	Ratification: 2010-04-12
8.	Convention on the Protection of the Marine Environment of the Baltic Sea Area	2000-01-17	Signature: 1992-04-09 Ratification: 1995-06-08
9.	Convention on the Physical Protection of Nuclear Material	1994-06-08	accession: 1994-05-09
10.	Vienna Convention on Civil Liability for Nuclear Damage	1994-08-09	accession: 1994-05-09
11.	Convention on Early Notification of a Nuclear Accident	1994-06-09	accession: 1994-05-09
12.	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	1994-06-09	accession: 1994-05-09
13.	Convention on Nuclear Safety	2006-05-04	accession: 2006-02-03
14.	Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention	1994-08-09	accession: 1994-05-09
15.	Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	2006-05-04	Signature: 2001-01-05 ratification: 2006-02-03
16.	Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)	2001-07-17	Signature: 2001-07-17
17.	Amendment to the Convention on the Physical Protection of Nuclear Material	2016-05-08	ratification: 2009-02-24

### Safeguards Agreements

Reg.No	Title	In Force	Status
1240	Application of safeguards in implementation of Article III (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons (with Protocol)	2005-12-01	accession: 2005-07-28
1696	Agreement between the Government of the Republic of Estonia and the IAEA for the Application of Safeguards in connection with the Treaty of the Non-Proliferation of Nuclear Weapons	1997-11-24	Signature: 1997-11-24
1769	Prot.Add. to Agreement between the Rep. Austria, the Kingdom of Belgium, the Kingdom of Denmark, the Rep. of Finland, the Federal Rep. of Germany, the Hellenic Rep., Ireland, the Italian Rep., the Grand Duchy of Luxembourg, the Kingdom of the Netherlands, the Portuguese Rep., the Kingdom of Spain, the Kingdom of Sweden, the European Atomic Energy Community and the IAEA in Implementation of Article III, (1) and (4) of the Treaty on the Non-Proliferation of Nuclear Weapons	2005-12-01	accession: 2005-07-28