

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

**National Report from Estonia**

Estonian Radiation Protection Centre  
Second Review Meeting  
May 2006

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## **Section A. Introduction**

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was adopted on 29 September 1997 in the Vienna Diplomatic Conference. Estonia signed the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management 05 January 2001. Estonian Parliament ratified the convention 19 October 2005. Estonia deposited the instrument of accession to the Joint Convention on 03 February 2006. The convention will entry into force 04 May 2006.

Most of the radioactive waste that needs further management measures is caused by the past activities during the Soviet time and the major generator of radioactive waste in Estonia is the decommissioning Paldiski Nuclear Submarine Training Facility. The plans for decommissioning of nuclear facilities are discussed shortly as well. There is also facility for interim storage for the radioactive waste produced in the decommissioning process and also for radioactive waste produced by various small users of radioactive substances, such as hospitals, universities, research institutes and industry in Paldiski.

Radioactive waste depository, which was used during the Soviet time is situated in Tammiku and is temporarily closed due to the safety risks. The environmental impact assessment process is in the preparation in order to find the ways to improve its safety.

The uranium mining and milling facility in Sillamäe was operational in late 1940's – early 1980's. Small amounts of radioactive wastes arise from a number of facilities using radioactive sources in medical, research and industrial application. Furthermore, the development in waste management policies and practices during the reporting period is described.

Radiation Act provides that the benefits accruing from the use of radiation and practices involving exposure to radiation shall exceed the detriment it causes; that the practice shall be organized in such a way that the resulting exposure to radiation hazardous to health is kept as low as reasonably achievable and that no person's exposure shall exceed the maximum values prescribed in the Radiation Act. These general safety principles, included in the Radiation Act, apply to management of radioactive waste arising from decommissioning the nuclear facility and also to other radioactive waste.

Estonia is a member state of the European Union from 1st May 2004. Thus, the regulations of the Union are in force in Estonia. When necessary, the Estonian regulations have been modified to take into account the EU regulations. The EC Directives relate e.g. to radiation protection and transboundary movements of radioactive waste, whereas there are so far no regulations pertaining directly to safe management of spent nuclear fuel and radioactive waste.

The present report is the first Estonian National Report and is presented for the Second Review Meeting to the Convention, which takes place 15 – 24 May 2006 at IAEA in Vienna. The report is prepared in accordance with the Guidelines regarding the Form and Structure of National Reports (INFCIRC/604, 1 July 2002) established by the Contracting Parties under Article 29 of the Convention at the Preparatory Meeting at IAEA 10 - 12 December 2001.

The report is prepared by the Estonian Radiation Protection Centre under the Ministry of the Environment, in co-operation with radioactive waste management agency A.L.A.R.A Ltd.

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

- the Estonian radiation and waste safety legislation fulfills the obligations of the Convention
- the Estonian regulatory infrastructure is in compliance with the Convention obligations

- the regulatory and licensing policies and the practical implementation of the radioactive waste management comply with the Convention obligations
- there are some future challenges to enhance safety, notably in the area of working out the policies; these challenges are discussed in the report.

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

## **Section B. Policies and Practices**

### *Article 32. Reporting (Paragraph 1)*

*In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention. For each Contracting Party the report shall also address its:*

- (a) spent fuel management policy;*
- (b) spent fuel management practices;*
- (c) radioactive waste management policy;*
- (d) radioactive waste management practices;*
- (e) criteria used to define and categorize radioactive waste.*

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

The main source of the radioactive waste is decommissioning of Paldiski facility. Other radioactive waste arises from a number of facilities using radioisotopes in medical, research and industrial applications.

According to Radiation Act liquid waste can be disposed of into a sewage system and solid waste can be delivered to a landfill site, if the activities are below the nuclide specific limits given in the regulation of the minister of the environment no 10 (2005). Sealed sources and other radioactive waste not eligible for disposal to landfill have to be delivered to a site approved by the Ministry of the Environment for storage.

According to Radiation Act the organization engaged in radiation practice is required to take any measures to render harmless radioactive wastes arising from its operation. Rendering radioactive waste harmless means any measure needed to treat, isolate or dispose of the waste, or to restrict its use so that it does not endanger human health or the environment. The state has the secondary responsibility in case that a producer of radioactive waste is incapable of fulfilling its management obligation /Radiation Act/. There are two options for the management of such radioactive waste - either return to the supplier/manufacturer of the sealed source or delivery to waste management agency against a waste management fee. In practice, most of waste from the use of unsealed sources in Estonia arise in such low activity concentrations or amounts that it is not necessary to arrange the storage of generated waste in the same way as e.g. for the sealed sources. A common practice is that radionuclide laboratories store their short lived radioactive wastes at their premises until they have decayed below the limits set for discharges.

At present Estonia has no general program document or a national strategy plan declaring its overall policy of radioactive waste management and disposal, and decommissioning of nuclear facilities. Nevertheless, the preparation and adoption of a National radiation safety action plan is a requirement in the existing legislation.

## **Section C. Scope of Application**

### *Article 3. Scope of Application*

*This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.*

*This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.*

*This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.*

*This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.*

As Contracting Party to the Joint Convention Estonia declares that airborne and liquid discharges from radioactive waste management facilities are included in the scope of this Convention. There is no production of radioactive wastes from military or defence programmes in Estonia in nowadays. Waste containing only naturally occurring materials (NORM-waste) except sealed radium sources, is not declared as radioactive waste for the purposes of the Convention.

## **Section D. Inventories and Lists**

*This report shall (also) include:*

- (a) a list of the spent fuel management facilities subject to this convention, their location, main purpose and essential features;*
- (b) an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain the description of the material and if available, give information on its mass and its total activity;*
- (c) a list of radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;*
- (d) an inventory of radioactive waste that is subject to this Convention that:*
  - is being held in storage of radioactive waste management and nuclear fuel cycle facilities;*
  - has been disposed of; or*
  - has resulted from past practices;**this inventory shall contain the description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;*
- (e) a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities*

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

### **Nuclear facilities under decommissioning**

Paldiski is the former USSR nuclear submarine training centre, which is in the process of being decommissioned. The nuclear facility Paldiski was established in the early 1960' for training the USSR navy personnel for the operation of submarine nuclear reactor's systems. Two full-sized PWR type reactors were installed. The reactors were close analogues of those operated on real nuclear submarines of the Echo and Delta classes. The operating nuclear propulsion system with their complete power transmission to propeller shafts and the corresponding hydraulic brake systems has been used as training stands. The first-generation 70 MWth reactor was commissioned in 1968. In all this 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 in all for about 5,300 h until December 1989. 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 both seal-welded, reactor vessels with their primary circuits, auxiliary equipment and some additional waste were partly grouted, seal-welded and enclosed into concrete sarcophagi. Table 1 shows some main data of the reactors. In 1995 the ownership and control of the site were officially transferred to Estonia. Since 1995 the work on monitoring, dismantling, decommissioning, decontamination and dismantling of the Paldiski facilities is in progress. Site is under administration of Waste Management Agency A.L.A.R.A. Ltd.

*Figure 1.* Location of radioactive waste sites in Estonia



*Table 1.* Information about radioactive waste sites in Estonia

Owner	Ministry of the Economy and Communication
Location	Paldiski
Purpose	Former Nuclear Submarine Training Centre
Inventory	The total activity enclosed in two nuclear reactors and their auxiliary systems is ca 230 TBq and it comprises mainly of the activation products such as $^{55}\text{Fe}$ , $^{60}\text{Co}$ , $^{63}\text{Ni}$ , $^{152}\text{Eu}$ and $^{154}\text{Eu}$ . Some sealed sources with total activity of 5 TBq has also been poured into concrete there
Essential Features	Under decommissioning
Owner	Ministry of the Economy and Communication
Location	Paldiski, 50 km west from Tallinn
Purpose	Interim Storage

Inventory	Ca 1000 TBq, mainly spent sealed sources of <sup>90</sup> Sr, <sup>137</sup> Cs, <sup>60</sup> Co and Pu-Be neutron sources
Essential Features	Operational

Owner	Ministry of the Economy and Communication
Location	Tammiku, 12 km south of Tallinn
Purpose	Radioactive waste depository
Inventory	Ca 76 TBq, mainly spent sealed sources of <sup>90</sup> Sr and <sup>137</sup> Cs
Essential Features	Temporarily closed

Owner	Silmet Group
Location	Sillamäe
Purpose	Former uranium mining and milling facility
Inventory	1830 tons of U, 850 tons of Th and up to 3000-4000 TBq their daughter products, including Ra
Essential Features	Tailing pond is under remediation

Table 2. Characteristics of the 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

***The nuclear facility Paldiski was established in the early 1960' for training the USSR navy personnel for the operation of submarine nuclear reactor's systems. Two full-sized PWR type reactors were installed. The reactors were close analogues of those operated on real nuclear submarines of the Echo and Delta classes. The operating nuclear propulsion system with their complete power transmission to propeller shafts and the corresponding hydraulic brake systems has been used as training stands. The first-generation 70 MW***

## **Radioactive waste management facilities**

There are 2 radioactive waste management facilities subject to the Convention in Estonia:

- Paldiski - interim radioactive waste storage
- Tammiku - the radioactive waste storage facility

Sillamäe tailing pond remediation project is in the final stage, the final layer of the covering is will be finished by 2007.

Both sites - Paldiski and Tammiku, are under administration of the Waste Management agency, who also has responsibility for the collection, conditioning and storage of radioactive waste from the Paldiski nuclear facility and on a commercial basis, also from all other users of radioisotopes in Estonia.

The Interim storage facility is in operation since 1997. It is situated in the Main Technological Building of the Paldiski Nuclear Facility and consists of a reinforced concrete structure with the dimensions 13.25 x 11.8 m, the height is of 10 m and the wall thickness of 25 cm - designed for 720 standard size (1,2 x 1,2 x 1,2 m) concrete waste containers. The storage is divided into two sections and is situated close to the second reactor sarcophagi.

The radioactive waste storage facility at Tammiku was built in 1960 in accordance with the criteria developed in the USSR in the late 1950's. The facility was designed by the USSR standard type of the so called Radon facilities and was the central storage facility for radioactive waste generated from use of radionuclides in Estonia. In the mid-1980's reconstruction was planned to upgrade this facility with the new revised USSR criteria on safe management of radioactive waste, but this work was never started because the lack of resources. Since November 1995 the Tammiku facility is managed by A.L.A.R.A Ltd. The facility operation was finished in 1996 and in November 1996 the storage vaults were closed and covered.

The licensing database maintained by Estonian Radiation Protection Centre, includes source-specific information on each sealed source in licensee's possession. This information is updated continuously according to licensees' notifications and observations made during the licensing process and inspections. Small users of radioisotopes have in their premises radiation sources which are no longer in use but have not yet been declared as radioactive waste.

## **Section E. Legislative and Regulatory System**

### *Article 18. Implementing measures*

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

### *Article 19. Legislative and regulatory framework*

*Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.*

*This legislative and regulatory framework shall provide for:*

- (a) the establishment of applicable national safety requirements and regulations for radiation safety;*
- (b) a system of licensing of spent fuel and radioactive waste management activities;*
- (c) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;*
- (d) a system of appropriate institutional control, regulatory inspection and documentation and reporting; the enforcement of applicable regulations and of the terms of the licences;*
- (e) a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management.*

*When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall take due account of the objectives of this Convention.*

In Estonia, the legislation for radiation protection was established in 1997. Since then, a new Radiation Act came into force in 2004 and several amendments and new regulations have been issued. The Estonian legislation for radioactive waste management is part of the overall

Estonian legislation on radiation protection. A list of relevant Acts, Orders etc. in force per 1 January 2006 is given in annex A. The Estonian legislative and regulatory system also implements all legislative requirements with regard to the Treaty Establishing the European Atomic Energy Community (Euratom). A list of relevant legal instruments according to the Euratom Treaty is given in annex B.

The main legal instrument is the Radiation Act. The licensing system for practises is described in Chapters 3-4 of the Act. The use of radiation requires a safety licence, which can be granted by the Ministry of the Environment upon application. A safety licence can be subject to extra conditions needed to ensure safety. In addition, the cases where a licence is not needed are identified, e.g. when the use of radiation or a device is exempted.

Under the Radiation Act (2004) radioactive waste management and decommissioning of nuclear installations are subject to authorisation from the Minister of the Environment and installations are subject to inspection from the Environmental Inspectorate.

#### *Article 20. Regulatory body*

*Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 19, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.*

*Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.*

Radiation Act and its administration belong to the responsibility of the Minister of the Environment and is as such independent of the Ministry of Economy and Communication under which the operation of the radioactive waste management and decommissioning of the nuclear installations at Paldiski belongs.

The Nuclear Regulatory Authorities according to the Radiation Act is the Ministry of the Environment. In the act it is also stated: The performance of activities related to radiation protection shall be organised by the Ministry of the Environment within the limits of its competence through the Environmental Inspectorate and the Estonian Radiation Protection Centre. Both Estonian Radiation Protection Centre and Environmental Inspectorate have their own budget on the annual Fiscal Act.

According to the regulation of the Ministry of the Environment, ERPC has the following duties:

- participation in the preparation and organization of the radiation protection policy, development and financial plans
- advising the regulatory authorities in radiation protection
- checking the applications for the radiation practices and preparation of the licenses, analyzing the assessments given to the actions
- keeping the archive of the documents concerning the radiation practice licenses
- keeping the registry of the radiation practice licenses on the paper and also electronically
- participation in the preparation of the legislation concerning the radiation protection
- keeping the state registry of the the doses of radiation workers
- keeping the registry of the radioactive sources, nuclear material and radioactive waste
- assessment to the import-, export and transit applications, making proposals for issuing the licenses and gives if required information to the international organizations
- giving out the materials to consult the licensees in order to increase the safety of the activities according to good practices
- checking during the license granting process that the presented documentations is in accordance with the real situation on site and in the case of non accordance informs the Environmental Inspectorate about the case
- preparing the reports according to international agreements and EU legislation
- contact point for EURATOM and IAEA

- co-operating with other national and international organizations in radiation protection questions
- organizing the monitoring of the radionuclides in the air, soil, water and food; analyzes these results
- organizing the assessments of the doses from radiation activities for the population
- laboratory analyzes for the radionuclides
- participation in preparation of the emergency plan for the radiation emergency, in the testing of that plan and also participates in the real emergency case
- participation in the preparation of radiation specialists
- responsible for the early warning system
- publication of the results of the monitoring and providing information about the dangers of radiation and protection measures
- organizing the radiation protection trainings and prepares the training materials
- according to CTBT agreement fulfills the NDC responsibilities
- answering to all requests/proposals made in the field of radiation protection

Estonian Radiation Protection Centre has access to all premises during the licensing process and Environmental Inspectorate has direct access to all premises, buildings etc. for inspection purposes and to withdraw licensees and stop operations in case of unsecured situations.

The Estonian legislative and regulatory system described above implements all obligations under Article 18 (Implementing measures), Article 19 (Legislative and regulatory framework) and Article 20 (Regulatory body) of the Convention.

## **Section F. Other General Safety Provisions**

### *Article 21. Responsibility of the licence holder*

*Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.*

*If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.*

According to the Radiation Act and the pursuant degrees the prime responsibility for the safety of a installation rests with the holder of the licence. The holder of such a license to ensure that all radioactive waste produced under his license is handled in a safe manner and finally either returned to the manufacturer or send to the Waste Management Agency. In the Radiation Act it is also stated that the Regulatory Authority can redraw a license due to safety concerns or other compelling reasons, i.e. if the holder do not meet its responsibility. Ultimately the punishment for violations of this Act and/or provisions is penalties.

It is the responsibility of the Estonian Radiation Protection Centre to verify that the licensees fulfill the regulations. The license holders are subjugated inspections by the Environmental Inspectorate and their license can be redrawn for a period until the corrective measures requested are fulfilled. The verification is carried out through safety reviews and assessments as well as inspection programmes (carried out together with Environmental Inspectorate). Ultimately the punishment for violations of this Act and/or provisions is penalties. As a precondition for granting a radiation activity licence for the use of radiation the Radiation Act requires that the applicant presents a valid proof on safe management of any radioactive waste, which may be generated. Radiation Act provides that the responsible party shall organize the practice so that it meets all radiation safety requirements prescribed in the Act and take all measures needed to render radioactive waste arising from its operation harmless. The Act also provides for the responsibility of decontamination of the environment,

if the radioactive material is released in such an extent that resulting health or environmental hazards requires action. According to the Act, in utilization of natural resources containing radioactive materials, the responsible party shall ensure that radioactive wastes do not pose any health or environmental hazards during the operations, including the final stages.

The Radiation Act provides that if the responsible party does not meet the requirements set for radioactive waste management, the State has the secondary obligation in managing the radioactive waste or residues. The same applies if the origin of waste is unknown, or no primary responsible party can be found.

Radioactive waste management agency A.L.A.R.A Ltd holds, as part of the general authorisation the license to collect, condition and store radioactive waste at the Interim storage of Paldiski facility from the decommissioning of the nuclear facility at Paldiski site as well from all other users of radioisotopes in Estonia. Waste Management Agency sites in Paldiski and Tammiku have been subjugated inspections by the Estonian Radiation Protection Centre and Environmental Inspectorate and redrawing the license has never been considered.

#### *Article 22. Human and Financial Resource*

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

- (a) qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;*
- (b) adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;*
- (c) financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility.*

Requirements on qualifications of and educational programs for staff-members working with safety issues are included in Operational Licence. Chapter 4 of the Radiation Act prescribes that the responsible party is required to ensure that in safety related matters of the operations the expertise is available, taking into account the nature and the risks posed by the operation. The responsible party can appoint a special radiation safety officer. In a licence application the applicant shall provide information on the competence of the persons working with radiation. According to Chapter 7 of the Radiation Act, the licensee shall furnish security to ensure that it will meet the costs of waste management or any decontamination measures, if the operations are liable to produce radioactive waste that cannot be rendered harmless without substantial cost.

Waste Management Agency is government property placed under the Ministry of the Economy and Communication and as such, the financial situation for it is and will be secure also in the future in order to ensure adequate financial resources to meet the requirements to the safety of the storage facility set by the Regulatory Authorities.

#### *Article 23. Quality Assurance*

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

The quality assurance at Paldiski is guaranteed by implementing the set of regulations covering radiological protection of workers, physical safety, waste acceptance criteria, environmental monitoring and written work procedures. ERPC own Quality Manual is under preparation. Part of the measurement activities are accredited and Quality Manual for laboratory is approved.

## Article 24. Operational Radiation protection

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

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

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

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

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

The general principles for radiation protection (justification, optimisation, dose limitation) are given in the Radiation Act. The Ministry of the Environment has issued the general regulation on dose limits for ionising radiation. This Regulation covers both nuclear facility decommissioning and non-nuclear practices in Estonia. The general principles and the numerical dose limits for both workers and the general public prescribed in the regulation are in accordance with Council Directive 96/29/EURATOM and the 1990 Recommendations of the International Commission on Radiological Protection, ICRP Publication 60.

In Operational Limits and Conditions for Paldiski/Tammiku there are given stringent rules on reporting received doses to the Estonian Radiation Protection Centre in normal situations where doses are within the dose limits as well as in abnormal situations where doses might have exceeded the dose limits.

The requirements in Operational Limits and Conditions make sure that discharges are limited and measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment. The requirements covered following areas:

- reporting of Discharge systems and limits
- Precautions against abnormal incidents; and
- Prompt reporting to the Nuclear Regulatory Authorities in case of abnormal situation and/or violation of Operational Limits and Conditions.

In addition there are requirements of the Radiation Act: the licence holder has to inform immediately the Radiation Centre and the alarm centre of the Rescue Board of accidents which take place in the course of radiation practices and of events of exposure in doses exceeding the dose limits.

There is no information about the discharges during the operational lifetime of the Paldiski facility until the ownership transfer to Estonian, nor of the Tammiku facility prior takeover it by the present operator (AS A.L.A.R.A.). Some liquid and airborne discharges have arise from the decommissioning of Paldiski nuclear facilities. The discharge limits are specific to nuclides or nuclide groups and they are in conformity with the dose constraint of 0.1 mSv per year to the member of the critical group among the general public. According to environmental monitoring data, concentrations of all detectable radionuclides are moderately low but do show evidence of site contamination. The reported levels of tritium vary from about 10 to 1400 Bq l<sup>-1</sup> and for Sr-90 vary from about 0.03 to 0.25 Bq l<sup>-1</sup>. If to take into account only positive determinations of Cs-137, it has varied from 0.2 to 0.7 Bq l<sup>-1</sup>. A systematic decrease in liquid discharges from Paldiski has occurred during last decade.

Estonian Radiation Protection Centre has carried out monitoring around Pakri Peninsula. It covers fish, seaweed, seawater and bottom sediments. Sampling is generally conducted on an irregular, but approximately annual basis, with analysis apparently limited to Cs-137. For the seawater 1998-2005 the concentrations of Cs-137 vary from 38 Bq m<sup>-3</sup> to 73 Bq m<sup>-3</sup>. The

bladderwrack, *Fucus vesiculosus*, has been sampled on the coastline near to the Paldiski outfall annually since 1998 (with samples generally collected in late autumn/early winter). Concentrations of Cs-137 have been reported from 22 to 34 Bq kg<sup>-1</sup> dw. Data obtained from the environmental monitoring program of Tammiku facility shows detectably levels for tritium, the results are between 10-500 Bq/l and in two occasions for Sr-90 up to 0.05 Bq l<sup>-1</sup>.

#### *Article 25. Emergency Preparedness*

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

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

The Estonian Emergency Preparedness System for Nuclear Accidents is under the responsibility of The Minister of Interior. The operative organisation is based primarily on the Rescue Board.

Estonia has a nation-wide nuclear emergency plan in case of accidents at nuclear facilities in foreign countries. The plan has special precautions for nuclear installations close to Estonian territory and is going through the revision process. ERPC is the National Warning Point and the National Competent Authority in Estonia for any kind of situation which might result in actual or potential deterioration of radiation safety of the population, environment or society. ERPC has an expert on duty for 24 hours a day, in order to be able to immediately give advice to local and governmental authorities on needed emergency response actions.

Early warning in case of a radiological emergency in Estonia or at a facility in the vicinity of Estonia is based on international agreements on exchange of information and on bilateral agreements, which Estonia has entered with a number of neighbouring states (Finland, Latvia). Estonia is Contracting Party to the International Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. Furthermore, as a Member State of the European Union, the Commission Directives concerning accident situations apply in Estonia.

As a supplement to the early warning agreements an on-line system for automatic monitoring of radioactivity is in service 24 hours a day. The system provides monitoring data from 10 stations placed strategically in the country. The data is collected automatically at the Estonian Radiation Protection Centre, where a computer will give a signal to the officer on 24 hours duty if any increase in gamma radiation could be attributed to causes other than natural increase of the radon content in the air.

Emergency preparedness plan for radioactive waste management agency is prepared. The small users of the radioactive sources have to notify Estonian Radiation Protection Centre and Rescue Board immediately in case of any abnormal occurrences, connected with the use of radiation, that is substantially detrimental to safety, at the place where the radiation is used or in its environment. In addition ERPC has to be informed if a radiation source has disappeared, been stolen, lost or otherwise ceased to be in the licensee's possession.

#### *Article 26. Decommissioning*

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

- (a) qualified staff and adequate financial resources are available;*
- (b) the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;*
- (c) the provisions of Article 25 with respect to emergency preparedness are applied; and*
- (d) records of information important to decommissioning are kept.*

As stated under Article 22 Paldiski is national property and as such, the financial situation are and will be secure also in the future until all the installations are fully decommissioned. The Nuclear Regulatory Authorities will subsequent license the procedures in general and specific technical projects at a more detailed level ensuring the safety of the decommissioning in agreement with Article 26.

In conclusion for section F, it is found that the Estonian regulatory system implements all obligations under Article 21 (Responsibility of the licence holder), Article 22 (Human and financial resources), Article 23 (Quality assurance), Article 24 (Operational radiation protection), Article 25 (Emergency preparedness) and Article 26 (Decommissioning).

## **Section G. Safety of Spent Fuel Management**

### **Article 4. General safety requirements**

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

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

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

### **Article 5. Existing facilities**

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

### **Article 6. Siting of proposed facilities**

*Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility:*

- (a) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;*
- (b) to evaluate the likely safety impact of such a facility on individuals, society and the environment;*
- (c) to make information on the safety of such a facility available to members of the public;*
- (d) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*

*In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.*

### **Article 7. Design and construction of facilities**

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

- (a) the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;*
- (b) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;*
- (c) the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.*

### **Article 8. Assessment of safety of facilities**

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

- (a) before construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;*
- (b) before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in*

paragraph (a).

#### **Article 9. Operation of facilities**

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

- (a) the licence to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;*
- (b) operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;*
- (c) operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;*
- (d) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;*
- (e) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;*
- (f) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;*
- (g) decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.*

#### **Article 10. Disposal of spent fuel**

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

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

## **Section H. Safety of Radioactive Waste Management**

#### **Article 11. General safety requirements**

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

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

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

The relevant general regulations are beside the Radiation Act is the regulation of the radioactive waste management. Requirements in Operational Limits and Conditions on handling, storing and transport of fissile material make sure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed. The Act and regulation are also refer to working methods for waste minimization. The licensee must have clear working procedures in order to avoid transfer of unnecessary transfer of objects and materials in the controlled areas.

One of the policies incorporated in all Estonian regulations with articles regulating handling of radioactive waste is sorting at the source. The policy applied at the national level ensures that the generation of radioactive waste is kept to the minimum practicable and that biological, chemical as well as other hazards are taken into account.

As stated in Section F protective methods providing for effective protection of individuals, society and the environment are part of the national framework legislation and with due regard to internationally endorsed criteria and standards.

Radioactive waste management is covered also by the requirements of the environmental

impact assessment law. This means that all possible hazards are considered in EIA reports.

#### **Article 12. Existing facilities and past practices**

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

- (a) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;*
- (b) the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.*

According to the Radiation Act (Section E and F) the Waste Management Plant has during its more operation under Estonian jurisdiction been subjugated inspection by the Nuclear Regulatory Authorities. These inspections have been carried out continuously and as such also at the time when the Convention came into force.

At the time when the Convention came into force no intervention for reasons of radiation protection is considered necessary as a result of past practices in Estonia.

Radioactive waste sites in Paldiski and Tammiku are covered by the radiation activity license.

#### **Article 13. Siting of proposed facilities**

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

- (a) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;*
- (b) to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;*
- (c) to make information on the safety of such a facility available to members of the public;*
- (d) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.*

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

#### **Article 14. Design and construction of facilities**

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

- (a) the design and construction of a radioactive waste management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;*
- (b) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;*
- (c) at the design stage, technical provisions for the closure of a disposal facility are prepared; the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.*

#### **Article 15. Assessment of safety of facilities**

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

- (a) before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;*
- (b) in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;*
- (c) before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (a).*

#### **Article 17. Institutional measures after closure**

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

- (a) records of the location, design and inventory of that facility required by the regulatory body are preserved;*
- (b) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and*
- (c) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.*

As stated in section B the Ministry of the Environment has to prepare Radiation Protection Action Plan in 2006 and based on that there will be further initiation of the preparation of the document concerning radioactive waste management strategies. This document would be the starting point for the process preparing a basis for decisions concerning a Estonian disposal facility for low and intermediate waste. This initial process will make sure that all necessary steps are taken to implement fundamental principles and requirements for such a disposal facility in compliance with national and international obligations and recommendations.

Prior to siting, construction and commissioning of a Estonian disposal facility the project will be subject to an Environmental Impact Assessment according to Estonian legislation which implements Council Directive 85/337/EEC and 97/11/EC. In addition, prior to the commissioning of a disposal facility the European Commission will be provided with general data relating to the disposal project making it possible for the Commission to assess whether the implementation of the project is liable to result in a radioactive contamination of the water, soil or airspace of another Member State as called for under the Article 37 of the Euratom Treaty. The presented data will be in compliance with the Commission Recommendation 1999/829 of 6 December 1999.

#### *Article 16. Operation of facilities*

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

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

The Waste Management Plant at Paldiski/Tammiku existed before the Radiation Act was put into force in 1997. Consequently this law did not regulate the original design of the installations and the initial constructions. However the design and construction of the Paldiski installations are in accordance with international practice and regulated through licences in accordance

with the Radiation Act as described in section F. Tammiku facility is temporarily closed and as its design is not in accordance with international practice, it has been agreed that the environmental impact assessment will be started in order to find the most optimum way to upgrade the facility.

Safety assessments were performed for Tammiku and Paldiski and approved by the Estonian Radiation Protection Centre in the licensing procedures. The safety analyses will subsequently be updated in accordance with requirements in radiation practice licence.

In conclusion for section H, it is found that the Estonian regulatory system implements all obligations under Article 11 (General safety requirements), Article 12 (Existing facilities and past practices), Article 13 (Siting of proposed facilities), Article 14 (Design and construction

of facilities), Article 15 (Assessment of safety of facilities), Article 16 (Operation of facilities) and Article 17 (Institutional measures after closure).

## **Section I. Transboundary movement**

### *Article 27. Transboundary movement*

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

*In so doing:*

- (a) a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;*
- (b) transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;*
- (c) a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;*
- (d) a Contracting Party which is a State of origin shall authorize a accordance with the consent of the State of destination that the requirements of subparagraph (c) are met prior to transboundary movement;*
- (e) a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.*

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

*Nothing in this Convention prejudices or affects:*

- (a) the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;*
- (b) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;*
- (c) the right of a Contracting Party to export its spent fuel for reprocessing;*
- (d) rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.*

The Government has issued Regulation No. 243 of 8 July 2004 on international transfer of radioactive waste. This Order implements all obligations under Article 27 (Transboundary movement) of the Convention. The regulation is the Estonian implementation of Council Directive 92/3/EURATOM of 3 February 1992 on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community. The Order does not cover, in compliance with the Council Directive, shipments of sealed radioactive sources not containing fissile material when returned by its user to the supplier of the source in another country. According the Radiation Act there is need to apply for radiation practice licence in order to transport radioactive material. The transport of radioactive materials is covered by regulation for the transportation of dangerous goods. As far as radioactive material is of concern, additional requirements are given in Radiation Act.

The Ministry of the Environment has until now never received an application and consequently never issued any licence for a transboundary movement of radioactive waste with Estonia as the country of origin or with Estonia as the country of destination. There has also been no authorisations for transboundary movements of radioactive waste between EU-countries with Estonia as a country of transit since the above-mentioned regulation came into force.

## **Section J. Disused sealed Sources**

### *Article 28. Disused sealed sources*

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

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

The use of sealed radioactive sources in industry, hospitals and laboratories is covered by the Radiation Act and several regulations. These legal documents implement all obligations under Article 28 of the Convention ensuring that the possession and storage of disused sealed sources take place in a safe manner. Radiation Act requires that there is prior authorization for all activities with radioactive sources for holding the source. This license is given upon written application. General conditions are laid down in the Radiation Act and regulations. All premises where radioactive sources are employed are inspected regularly at least once in 5 years by Environmental Inspectorate or by Estonian Radiation Protection Centre. For sealed sources the inspection frequency is normally once in 3 years. The main objective of an inspection is to validate that radioactive sources are used and stored safely and other conditions set in the radiation activity license preserve. Any changes must be notified to the license provider. Licensing and source information is stored in a database maintained by ERPC and license holder has the requirement to provide every year the data about the inventory of the sources to Estonian Radiation Protection Centre. When new sources are authorized for use, it is required according to Radiation Act that the applicant has also to present a plan on measures to be taken when it becomes a disused source. As stated in section F it is the responsibility of the licence holder to ensure that disused sealed sources are handled in a safe manner and finally either returned to the manufacturer or send to the Waste Management Agency at Paldiski. The first option is preferred. In Estonia neither manufacturing nor remanufacturing of sealed sources takes place.

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

Fixed monitors for vehicles and railway traffic have been installed to all major crossing points at the Estonian-Russian border and Tallinn Airport. In all crossing points the custom officers are equipped with portable monitors. Biggest scrap metal companies have installed fixed monitors at the gates of their installations. There have been several trainings provided by ERPC to custom officers and staff of the scrap metal companies. Several procedures have been prepared in co-operation. In exceptional cases ERPC will be notified.

## **Section K. Planned Activities to Improve Safety**

Estonia does not declare waste containing only naturally occurring radioactive materials, which do not arise from the nuclear fuel cycle as radioactive waste for the purposes of the Convention.

For Estonia year 2006 is very important because the radiation protection action plan for 2006-2016 is currently under preparation. This will aid in clearing up murky legislative areas and clearly delineate responsibilities between ministries. All of our future planning will be based around this document, thus it is essential that we take part in whatever way possible. From this action plan one of the developments will also be national radioactive waste management strategies. The initial work should also propose fundamental principles and requirements for a disposal facility in accordance with national and international obligations and recommendations

## **Section L. Annexes**

### **Annex A. Estonian Legislation – Spent Fuel and Radioactive Waste**

The Estonian legislation listed below is in force per 1 January 2006. The legislation is available in Estonian (and partly in English) at the web site of the Estonian Radiation Protection Centre: [www.kiiruskeskus.ee](http://www.kiiruskeskus.ee).

#### Act:

Radiation Act (entered into force 1 May 2004)

#### Regulations of the Government:

- Regulation No. 163 of 30 April 2004: The Bases for Calculation of Exemption Values, and the Exemption Values for Radionuclides
- Regulation No. 193 of 17 May 2004: Effective Dose and Equivalent Dose Limits for the Lens of the Eyes, Skin and Extremities for Exposed Workers and Members of the Public
- Regulation No. 243 of 8 July 2004: Procedure Specifications for Processing Documents of Import, Export and Transit of Radioactive Waste Based on Country of Origin and Destination
- Regulation No. 244 of 8 July 2004: Statutes for Maintenance of the State Dose Register of Exposed Workers

#### Regulations of the Minister of the Environment

- Regulation No. 41 of 29 April 2004: The Time Limits for Proceedings to Issue, Amend or Revoke Radiation Practice Licences, the Specific Requirements for and Format of Applications for Radiation Practice Licences, and the Format of Radiation Practice Licences
- Regulation No. 86 of 8 July 2004: Requirements for Exposed Workers Radiation Safety Training
- Regulation No. 93 of 14 July 2004: Intervention and Action Levels, and Emergency Exposure Guidance in a Radiological Emergency
- Regulation No. 110 of 27 August 2004: The Requirements for the Results of Individual Monitoring of Outside Workers, and for Formalising Such Results, and for the Standard Format for the Dose Chart of Outside Workers
- Regulation No. 113 of 7 September 2004: Requirements for the Rooms Where the Radiation Sources Are Situated and for Labelling Thereof and for the Working Rules for the Performance of Radiation Practices
- Regulation No. 127 of 12 October 2004: The Format of Activity Licences of Qualified Experts and Applications Therefor and the Procedure for the Issue, Extension, Suspension and Revocation of Activity Licences
- Regulation No. 8 of 9 February 2005: The Classification of Radioactive Waste, the Requirements for Registration, Management and Delivery of Radioactive Waste and the Acceptance Criteria for Radioactive Waste
- Regulation No. 10 of 15 February 2005: The Clearance Levels for Radioactive Substances and Materials Contaminated with Radioactive Substances Resulting from Radiation Practices, and the Requirements for Their Clearance, Recycling and Reuse
- Regulation No. 45 of 26 May 2005: 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

## **Annex B. Legal Instruments according to the Euratom Treaty - Spent Fuel and Radioactive Waste**

- Council Directive 96/29/EURATOM of 13 May 1996 on the protection of the health of workers and general public against the dangers arising from ionizing radiation
- Council Directive 97/43/EURATOM of 30 June 1997 on health protection of individuals against dangers of ionizing radiation in relation of medical exposure, and repealing Directive 84/466/EURATOM
- Council Directive 92/3/EURATOM of 3 February 1992 on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community
- Council Directive 2003/122/EURATOM of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources
- Council Regulation 93/1493/EURATOM of 8 June 1993 on shipments of radioactive substances between Member States

## **Annex C. Principles for Clearance of Radioactive Substances**

Radioactive substances or materials containing radioactive substances may be cleared from their regulatory control due to their radioactivity, when special radiation protection requirements regarding activity levels etc. are fulfilled. This means in practice that cleared materials can be treated and handled as non-active materials. Clearance can include disposal as non-active materials, recycling and reuse of the materials in question. Clearance level: value, expressed in terms of activity concentrations or total activity, at or below which radioactive substances or materials containing radioactive substances arising from any practice subject to the requirement of a radiation practice licence may be exempt, pursuant to the procedure established by the Minister of the Environment, from the requirements of the Radiation Act. The clearance levels for radioactive substances and materials contaminated with radioactive substances resulting from radiation practices, and the requirements for their clearance, recycling and reuse are established by a regulation of the Minister of the Environment. The requirements of this Act need not be applied to radioactive substances and materials contaminated therewith if the radioactive substances which result from radiation practices have activity concentrations or total activity so low as to not require, from the radiation protection point of view, their processing and storage as radioactive waste. Such decision shall be made by the Minister of the Environment based on the request of the holder of the radiation practice licence. The effective dose expected to be incurred by any member of the public due to the cleared material is of the order of 0,01 mSv or less per year and the clearance should be the optimum choice according to the assessment done by qualified expert. The effective dose expected to be incurred by any member of the public due to the cleared material in addition to the normal background radiation from naturally occurring radionuclides is less than 0,3 mSv per year.