

*CO-ORDINATION NETWORK*



*ON DECOMMISSIONING*

# **Institutional, Legal and Regulatory Aspects; Licensing and Decommissioning Plan; Radiological Protection and Industrial Safety**

**Final Report**  
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# 1. Introduction

This report has been prepared under the Work Package 5 (WP5) of the Co-ordination Network on Decommissioning of Nuclear Installations (CND) under the contract no. 0508855 (FI60) from the European Commission's Research and Technological Development (RTD) Division to a consortium of European nuclear organisations. This work was carried out by Nuvia Ltd. (UK) acting as the work package manager supported by NRG of the Netherlands.

With the expansion of the European Union in 2005 incorporating ten new Member States and then again in 2007 incorporating two additional States - Romania and Bulgaria - significant divergences have been experienced amongst the Member States in socio-economic, technical, institutional and legal frameworks, and regulatory standards. In order to arrive at a better cohesion and consistency in institutional and legal frameworks and regulatory aspects in nuclear activities, particularly with regard to decommissioning and radioactive waste management, amongst these 27 States, it is considered useful to evaluate the prevailing situations in individual Member States and then act upon the findings to formulate a common harmonised framework. The objective of this study is stated in Section 2.

It should be recognised that during the early phases of the nuclear era, there were no standardised safety provisions or regulations on international scale. Individual countries had been following a national agenda or the collective agenda of the geo-political block to which the States belonged. However, international organisations such as the International Atomic Energy Agency (IAEA) and the Organisation for Economic Co-operation and Development/Nuclear Energy Agency (OECD/NEA), had over the years produced some standardised framework at the qualitative levels in design, operation, decommissioning and radioactive waste management practices. However, these were largely recommendations and advisory in nature. In matters of radiological protection, the International Commission on Radiological Protection (ICRP) produced authoritative documents which have become the basis for regulatory standards.

Over the years since the Common Market/European Economic Community/European Union (EU) came into existence, regulatory instruments such as Directives, Regulations, Guidelines and so forth have been produced under the EURATOM Treaty and under other legislative instruments. The extent to which these Directives, Regulations, recommendations as well as international treaties are implemented within Member States is obviously dependent on the extent of nuclear activities in that particular State. In principle, Directives have to be transposed to the legislative framework of the country in question. A brief outline of these EU Directives and international treaties and conventions relevant to decommissioning (including licensing and de-licensing) and radioactive waste management is given in Section 4.

In order to address the full extent of the subject matter of this report, it is considered pertinent to delineate the subject matter into the following four distinct areas:

1. Institutional and Legal Aspects for Nuclear Activities;
2. Regulatory Aspects - Licensing and De-licensing of Nuclear Installations including Decommissioning Plan;
3. Radiological Protection; and
4. Industrial Safety.

The twenty seven Member States have been listed alphabetically and considered sequentially covering the above mentioned subject areas. The four delineated subject areas are identified as Part I, Part II, Part III and Part IV under each individual Member State, thereby generating the country profile for the State.

Part I, under an individual Member State deals with the overall framework of institutional and legal aspects of nuclear activities. It does not go into the details of individual institutions but gives an overview of how institutional set-up is used to regulate nuclear activities in the Member State.

Part II deals with the regulatory aspects of licensing and de-licensing of nuclear installations including requirements for the decommissioning plan as a planned approach to decommissioning. As radioactive waste is an inevitable outcome of any decommissioning operation, regulatory provisions in the management of radioactive waste covering disposal provisions, release criteria (exemption and clearance criteria) are covered here.

Part III deals with the regulatory framework and standards for radiological protection amongst the Member States.

As decontamination, dismantling, waste treatment and conditioning, waste storage and disposal all involve significant amount of industrial activities, industrial safety and the control of such activities are important and are dealt with in Part IV.

It may, however, be pointed out that in two Member States – Cyprus and Malta – the level of nuclear activity is so low that country profiles for these countries have not been drawn.

All of these aspects are considered in Section 5.

Although EU standards in safety provisions for nuclear activities covering the full spectrum of plant operations, decommissioning and radioactive waste management are in force, there is no certainty that all Member States do fully comply with these standards. Without going into the details of the levels of compliance by Member States, this report attempts to present an overview of the present situation. From the country profiles, significant institutional, legal and regulatory issues for these countries have been drawn and presented in Annex 2 for ease of comparison between States.

Section 6 presents conclusions and recommendations such that attention may be directed in order to harmonise regulatory standards across the whole of the EU. Section 7 lists the references used in this report. Last, but not least, the respondents of various Member States and international organisations without whom this report could not be prepared are listed in Annex 3.

## 2. Objectives

Decommissioning is carried out under stringent regulatory regimes in order to ensure that the safety, security and well-being of the workforce and the public are maintained and the protection of environment is not compromised in any way. As decommissioning involves regulatory issues covering licensing and de-licensing as well as safety encompassing radiological and industrial matters, these issues are addressed separately and in a systematic way.

The aims of the study are:

- A. To produce an overview of the institutional and legal framework and outline the institutional responsibilities in matters of decommissioning and radioactive waste management in each of the EU Member States.
- B. To highlight licensing and de-licensing provisions including requirements for a decommissioning plan within the Member States.
- C. To describe the principles of radiological protection in the Member States.
- D. To take an overview of industrial safety.
- E. To identify and highlight commonalities and differences in approaches to all of the above items in each of the Member States.

### **3. Preparation of the report**

The responsibility for the preparation of the report under the Work Package 5 (WP5) was assigned to Dr. A. Rahman, representative of Nuvia Ltd (United Kingdom) as the Work Package Manager (WPM), supported by Mr. F. Van Gemert, representative of NRG (The Netherlands), and Mr. D. Majersky, representative of AllDeco (Slovak Republic) as Supporting Work Package Managers (SWPMs) in the year 2005. The Terms of Reference for this work were drawn by the WPM at the early part of 2005 and the work was distributed amongst the three partners. For specific reasons, AllDeco of Slovak Republic decided to withdraw from the Co-ordination Network on Decommissioning of Nuclear Installations (CND) and its responsibilities were taken over by the WPM.

The primary area of work distribution was to allocate a certain number of Member States out of the 25 Member States at that time and two Applicant Countries (Romania and Bulgaria) to the two partners. The work was divided into three phases: information gathering, information analysis and then consolidation and integration of information. In order to carry out the information gathering exercise, a comprehensive form of Questionnaire was prepared with the help of the partner, the CND Co-ordinator and other interested parties by the middle of 2005. By the end of 2005, this Questionnaire was sent out to competent bodies, nuclear regulatory authorities, government departments and/or other organisations of all Member States that were considered to be able to provide the requested information.

After the Questionnaires were sent out and some replies received, the information contained within the Questionnaires were analysed, verified and cross-checked by the WPM and country profiles were generated. This exercise of generating country profiles of the Member States proved to be much more onerous and time consuming than anticipated, as replies from countries would hardly come through without multiple reminders and sometimes the information received in the Questionnaire was found to be inconsistent. In such cases internet search and documents from NEA and IAEA were used to generate the country profiles.

In the Steering Group meeting of the CND on 12-13 January 2006, it was decided that when the country profiles were generated, they should be sent out to the respective country's competent bodies for a final check and endorsement. This proved to be rather unsuccessful, as in several cases the request to verify the country profiles remained unanswered. Nevertheless, by the middle of 2007 country profiles of most of the countries were generated and verified.

On completion of the second phase, consolidation and integration of information was started at around the end of 2007. On the basis of this assessment, conclusions and recommendations were drawn with a view to harmonising institutional framework and regulatory standards in decommissioning practices, radiological protection etc. A draft report was completed by the end of March 2008, which was distributed to the partners of the CND consortium to comment. A two-day meeting on 28<sup>th</sup> and 29<sup>th</sup> April 2008 was organised in Warrington, England to discuss and finalise the draft report for onward transmission to the European Commission.

The list of questions in the Questionnaire is given in Annex 1 to this report. For each country, the answers to the questions have been indicated in Section 5 of this report.

## 4. European legislation and international treaties

This section presents an overview of the existing European Union (EU) legislation and international treaties, conventions etc. which are relevant to this study. The primary basis for EU legislation in the nuclear sector is the Euratom Treaty, although other treaties may have a bearing on this sector.

There are a number of different legislative instruments in the EU. Council Directives are promulgated with the aim of establishing uniformity across the community by setting common objectives. Directives are binding on Member States as far as objectives are concerned but leave Member States with the freedom to transpose the required measures into their national legal and regulatory systems. Regulations, on the other hand, are directly applicable in law to all Member States. Other legislative instruments include recommendations, decisions and resolutions, but they are not binding on Member States.

There may also be non-Euratom Directives from the European Commission which will have the same effect and authority as the Euratom Directives. In addition, there may be international treaties, conventions and so forth to which Member States may become signatories and hence these international treaties would have a binding effect on them. Quite often EU Directives are produced assimilating these international developments and hence no conflict arises between international treaties and the EU Directives.

The following EU Directives are considered relevant to this study:

- (i) Council Directive 96/29/Euratom of 13 May 1996, *laying down basic safety standards for the protection of the health of workers and the general public against the dangers from ionising radiation* [1] (promulgated under the Euratom Treaty).
- (ii) Council Directive 97/11/EC of 3 March 1997 amending Directive 85/337/EEC of 27 June 1985 on the *assessment of the effects of certain public and private projects on the environment* [2] (non-Euratom Directive).
- (iii) Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the *assessment of the effects of certain plans and programmes on the environment* [3] (non-Euratom Directive).
- (iv) European Commission Recommendation of 15 September 1999 on a classification system for solid radioactive waste [4].

A summary of the regulatory aspects of the Directives, regulations and recommendations are given in Table 1.

**Table 1. Summary of Current Regulatory Aspects**

<b>Community Directives, Regulations etc</b>	<b>Relevance to Member States national legislation</b>
Euratom Treaty	Compulsory – to be ratified on accession
Directive 96/29/Euratom of 13 May 1996	To be transposed into the national legislation
Directive 97/11/EC of 3 March 1997	To be transposed into the national legislation
Directive 2001/42/EC of 27 June 2001	To be transposed into the national legislation
Classification of radioactive waste	Recommendation only
Metal clearance and recycling standards	Recommendation only
Concrete clearance and recycling standards	Recommendation only
Decommissioning guidelines	Recommendation only



## 5. Country profiles of individual Member States

### 5.1 Austria

The information for Austria was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

#### **Part I: Institutional and legal aspects**

##### 5.1.1 Primary legislation under which a nuclear licence is issued

Austria has never operated a nuclear power plant and does not intend to do so in the future. The construction and operation of nuclear facilities for energy production is prohibited in Austria under the law of December 15, 1978 (Federal Law Gazette No 676/1978). In 1999, the Austrian Parliament passed unanimously the Constitutional Law on a nuclear-free Austria, BGBl (BundesGesetzBlatt, i.e., the Federal Law Gazette) No. 149/1999 which prohibits the construction and operation of nuclear power plants (by nuclear fission) as well as transport of fissile materials (with some exemptions) or disposal of radioactive waste in Austria. However, where international obligations exist, they would prevail.

For licensing of other nuclear facilities, the primary legislation is Radiation Protection Act of June 11, 1969 (BGBl No. 227/1969) amended in 2002 to take into consideration the EU legislation. Under Article 9, each work activity with radioactive material exceeding the exemption limits needs a licence. The licence holder must fulfil specific requirements, conditions and obligations laid down in the operating licence.

##### 5.1.2 National legislative/regulatory body empowered to issue a nuclear site licence

Because of Austria's federal structure (composed of 9 independent Bundesländer – Burgenland, Carinthia, Lower Austria, Upper Austria, Salzburg, Styria, Tyrol, Vorarlberg and Vienna), the licensing procedures involve federal (Bund), regional (Länder) and provincial (Bezirks-verwaltungsbehörden) authorities. The administration in the federal structure exists in two forms: delegated authority and direct federal administration. Matters that are not dealt with by federal administrative authorities (i.e., federal ministries) are entrusted in the provinces to the provincial governors or their subordinates district commissioners. The responsibilities for licensing, inspection and regulation of nuclear facilities are therefore entrusted to different public authorities at federal, provincial and communal levels. The responsibilities are laid down in Article 41 of the Radiation Protection Act, Federal Law Gazette No. 227/1969 (as amended). Under the Radiation Protection Act, the responsibility for licensing and regulatory function is carried out by the Federal Minister for Agriculture, Forestry, Environment and Water Management (BMLFUW).

The construction and operation of installations for handling of radioactive materials and radiation emitting devices require licences according to Articles 5 to 7 of the Radiation Protection Act. The Radiation Ordinance contains further provisions for the licensing procedure. The licensing procedure is also subject to the provisions of the General Administrative Procedures Act.

##### 5.1.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The hierarchy of administrative authority is given in section 5.1.2. But basically, the federal authority produces the relevant legislation for licensing purposes.

- 5.1.4 National regulatory policy and/or Government policy for the decommissioning of nuclear facilities

As Austria has never operated a nuclear power plant and does not intend to do so in the future, there is no national regulatory policy and/or Government policy for the decommissioning of nuclear facilities.

- 5.1.5 Legal requirement for quality assurance in decommissioning

There is no decommissioning activity in Austria. However, there is a requirement for quality assurance in nuclear activities. Legal provisions for quality assurance are embedded in the licensing process (Article 5 to 7). It is enforced by periodic inspections by the licensing authority according to Article 17 of the Radiation Protection Act.

- 5.1.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The EC Directive 97/11/EC has been implemented by the Environmental Impact Assessment Act 2002, Federal Law Gazette No. 697/1993, as amended in 1997 and 2002. In the decommissioning of the ASTRA research reactor, an EIA has been carried out.

- 5.1.7 National policy defining stages of decommissioning of nuclear installations

The operators follow the IAEA defined stages of decommissioning. No special requirement for changes to the IAEA defined stages is foreseen.

## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.1.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

According to Article 12 (4), the operating licence of a nuclear facility (Articles 6 and 7) expires, if the licensed operation is suspended for more than three years or if the licensed facility has been shut down or decommissioned or if the licensee renounces the licence. The licence holder must notify any such circumstances to the competent authority who is then required to declare the expiration by official notification.

If an Environmental Impact Assessment (EIA) is deemed necessary, a separate decommissioning licence must be issued prior to the start of the decommissioning work. The Provincial Governor, who is the local competent authority, issues a licence according to the Environmental Impact Assessment Act 2002, Federal Law Gazette No. 697/1993 as amended, taking into account all applicable legislation.

Conditions are attached for the protection of individuals from ionising radiation. A separate decommissioning licence can contain conditions concerning the safe handling of radioactive material and waste. In the case of the ASTRA research reactor in Seibersdorf only significant changes to the original operating licence were subject to licensing provision. For example, the 1<sup>st</sup> stage of decommissioning involving fuel removal was done under the operating licence, but the 2<sup>nd</sup> stage requiring an EIA needed amendment to the initial operating licence according to the Radiation Protection Act.

5.1.9 Strategy specifying the approach to decommissioning

Each applicant for the construction and/or operating licence of any nuclear facility under the Radiation Protection Act must provide the licensing authority with a decommissioning plan and a waste management policy (Art 5, 6 and 7 of the Radiation Protection Act).

5.1.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

A Periodic Safety Report is part of the licensing requirements.

5.1.11 Decay periods for radioactive materials within a particular stage of decommissioning

A case by case system is used depending on the individual facility and the potential inventory.

5.1.12 Criteria for de-licensing a site

The same criteria are used as for handling radioactive material, as defined by the competent authorities.

5.1.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Discharges are regulated by Article 74 of the Radiation Protection Ordinance, Federal Law Gazette II No. 191/2005. Discharges are regulated such that the effective dose to a member of the public is limited to 0.3 mSv per year from all discharge routes. The licensing authority issues the discharge authorisation.

5.1.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The Austrian legislation follows the exemption and clearance criteria as defined in the German Radiation Protection Ordinance.

5.1.15 Waste categorisation scheme

Austria follows the IAEA waste categorisation scheme.

5.1.16 Waste disposal facilities within the country

Since Austria does not operate nuclear power plants, there are no major sources of HLW. At the moment, Austria operates three nuclear facilities: two research reactors (the Atominstitut Vienna operates a TRIGA Mark II research reactor and the Reaktorinstitut Graz operates the ARGONAUT reactor); and a central waste processing and interim storage facility at Seibersdorf. Nuclear Engineering Seibersdorf GmbH (NES), located at Seibersdorf, is responsible for the treatment, conditioning and storage of radioactive waste. The storage facility is the ASTRA research reactor building at the Austrian Research Centre, Seibersdorf, which was shut down in 1999. A small quantity of HLW arising from this shutdown research reactor has been returned to the United States in 2001 under the 'US origin nuclear fuel' agreement for final storage.

**Part III: Radiological Protection**

5.1.17 Radiological protection principles and standards

The radiation protection standards are in agreement with the EU Basic Safety Standards.

5.1.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The original Radiation Protection Act of June 11, 1969 (BGB No. 227/1969) was amended by the Federal Law Gazette 16/2000, 65/2002, 146/2002 and 137/2004 taking into account the recent EU provisions.

A recent amendment to the Radiation Protection Act by the Radiation Protection – EU-Adaptation Act [BGB No. 146/2002], August 2002 aimed at transposing the following EU Directives:

- EU Council Directive 96/29/EURATOM of 13 May 1996 laying down the basic safety standards for the protection of the health of workers and the general public against the dangers arising from radiation (OJ No. L 159 of 29 June 1996);
- EU Council Directive 97/43/EURATOM of 30 June 1997 on the health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing Directive 86/466/EURATOM (OJ No. L 180 of 9 July 1997);
- EU Council Directive 90/641/EURATOM of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionising radiation during their activities in controlled areas (OJ No. L 349/21 of 13 December 1990).

**Part IV: Industrial Safety**

5.1.19 Regulatory body overseeing industrial safety

Non-radioactive hazards are regulated by the Austrian Labour Inspectorate ( [http://www.arbeitsinspektion.gv.at/cgi-bin/MsmGo.exe?grab\\_id=560&page\\_id=6684672&query=labour+inspectorat](http://www.arbeitsinspektion.gv.at/cgi-bin/MsmGo.exe?grab_id=560&page_id=6684672&query=labour+inspectorat))

5.1.20 Statutory regulation controlling industrial safety

The Labour Inspection Act of the Federal Gazette No. 27/1993 and the Act on Occupational Safety and Health of the Federal Law Gazette No. 450/1994 as amended are the statutory laws.

**5.2 Belgium**

The information for Belgium was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

**Part I: Institutional and Legal Aspects**

5.2.1 Primary legislation under which a nuclear licence is issued

The protection of the public and the environment from the hazards of ionising radiation has been outlined in the Law of 29 March 1958. This law has subsequently been modified several times. The detailed stipulations of this law are given in the Royal Decree of 28 February 1963 and this Decree can be considered as the primary legislation on nuclear matters in Belgium. This Decree provides the General Regulations regarding radiation protection of workers and describes the responsibility of the licence holder of a nuclear installation covering civil liabilities. Article 6 of this Decree describes the licence regime for nuclear installations and the provision for issuing a nuclear licence by a Royal Decree by the King as the Competent Authority. Article 15 describes the inspection of nuclear installations.

## 5.2.2 National legislative/regulatory body empowered to issue a nuclear site licence

The construction and operation of nuclear installations are regulated by the Federal Government. These regulations are laid down by the Royal Decree of July 20, 2001, C-2001/00726 (GRPR-2001: General Radiological Protection Regulations). They implement the law of April 15, 1994 (as amended) on the protection of workers, the public and the environment against the hazards of ionising radiation, and the establishment of the Federal Agency for Nuclear Control (FANC) (Federaal Agentschap voor Nucleaire Controle)/ Agence Fédérale de Contrôle Nucléaire (AFCN). The FANC/AFCN web site is <http://www.fanc.fgov.be/>.

The licensing procedure for the decommissioning of class I facilities is exactly the same as the licensing procedure for a new facility (Article 6.3 to 6.8 of the Royal Decree of 20 July 2001). The Federal Agency for Nuclear Control (FANC)/ Agence Fédérale de Contrôle Nucléaire (AFCN) is the authorising body.

Sources of ionising radiation are classified at three levels for authorisation:

- Class I is the most restrictive one. This class includes nuclear power plants, fuel cycle facilities, facilities for storage and disposal of radioactive waste.
- Class II includes particle accelerators (Cyclotron, LINAC etc.), production or conditioning of isotopes extracted from irradiated fissile material, large medical facilities etc.
- Class III includes x-ray facilities, and other small sources of radiation.

Very small sources of radiation are classified as Class IV which does not require authorisation.

Class I authorisation is given by the King, but the licence application must be submitted to the FANC/AFCN. The licence application must provide the following information:

- General information giving the licence applicant's name and address, a description of the facility and its administrative organisation
- Detailed information relating to the site and its surroundings (geological, seismic and hydrological data, meteorological conditions, demographic details, economic activities, public roads etc)
- Detailed safety assessments covering normal and anticipated accident conditions of the plant
- An estimate of the radioactive material that is likely to be generated, the proposed treatment and conditioning of the waste materials, a plan for the decommissioning of the facility.

The regulatory and licensing department of the FANC/AFCN is in charge of handling the licence applications and defining conditions to the licence. For Class I facilities, the department has to ask for the advice of the local authorities as well as from the EC if Article 37 of the Euratom Treaty applies. After examination of the safety analysis report and the environmental impact assessment report, as well as the comments resulting from the consultation process received by the FANC/AFCN and its scientific committee, a final decision is taken and a Royal Decree is issued. When the decision is favourable, this Royal Decree constitutes the licence.

Class II and Class III plant authorisations are given by the FANC/AFCN.

5.2.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The FANC/AFCN is the regulatory body in charge of nuclear safety (licensing and de-licensing). The regulatory function for radiological protection is undertaken by the FANC / AFCN under the Royal Decree of 20 July 2001 'General Radioprotection Regulation for the Protection of the Workers, the Population and the Environment'. The head office of the FANC/AFCN is in Brussels and the website address is: <http://www.fanc.fgov.be>.

NIRAS/ONDRAF is the semi-public organisation responsible for the management of radioactive waste and fissile material.

AVN is the private organisation acting on behalf of the FANC/AFCN for providing technical support such as inspection of facilities etc.

For environmental protection, regional authorities are the authorising bodies and require an Environmental Impact Assessment. It should be noted that Belgium is a federal country, in which some authorities have been allocated to the Federal Government (nuclear matters, for example) and others to the Regional Authorities (environmental protection, for example).

For industrial safety, the Federal Ministry of Employment and Labour is the competent authority.

5.2.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

Although there is no defined Government policy or strategy on decommissioning, two recent public decisions have important implications on matters of decommissioning. One is the adoption of Belgian Phase Out Act (31 January 2003) and the other is the revision of the funding for the decommissioning of nuclear plants and the management of spent fuel.

5.2.5 Legal requirement for quality assurance in decommissioning

There is no legal requirement for quality assurance specific to decommissioning. However, the decommissioning plan approved by the competent authorities has to be supported by a good quality assurance system.

5.2.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The Royal Decree of 20 July 2001, C-2001/00726 enforces the EC Directive.

5.2.7 National policy defining stages of decommissioning of nuclear installations

There are no specific decommissioning stages. In the decommissioning plan, the licensee defines the programme and that is approved on a case-by-case basis.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.2.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

Article 17 of the Royal Decree of July 20, 2001 states that for the decommissioning of certain facilities, a decommissioning licence must be obtained before starting the actual decommissioning. However, if decommissioning works started before the Royal Decree of 20 July 2001, according to Article 81.2 of the same Royal Decree, they could be continued provided a decommissioning application was submitted before September 1, 2002.

The application to decommission an installation must be made to the FANC/AFCN. It must contain the following information:

- The modalities of decommissioning
- The new place of business of the organisation
- A description of the measures to ensure the health and safety of the workforce, the public and the environment during decommissioning.

The decommissioning of nuclear installations belonging to the Class I facilities, as well as some belonging to the Class II facilities, is subject to prior authorisation. For Class I installations, the decommissioning licence is granted by a Royal Decree, countersigned by the Minister responsible for nuclear safety and radiological protection, and for Class II installations, the licence is granted by the FANC/AFCN.

The licence period is specified in the licence. Conditions attached to the licence are agreed between the FANC/AFCN and the licence applicant. Any significant variation in procedures, status of dismantling, future use of the buildings or the site etc. has to be approved by the Agency.

#### 5.2.9 Strategy specifying the approach to decommissioning

The decommissioning strategy is specified by the licence applicant and submitted to the FANC/AFCN for approval. In the initial decommissioning plan, the licence applicant makes an estimate of the radioactive waste inventory from the dismantling operations. A structure issued by the radioactive waste management agency, NIRAS/ONDRAF, is available for the preparation of the decommissioning plan.

#### 5.2.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

For a Class I facility, a Periodic Safety Report is required every 5 years.

#### 5.2.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no defined decay period. However, considerations are made on a case-by-case basis.

#### 5.2.12 Criteria for de-licensing a site

For de-licensing of a site, the licensee must produce authorisations and free release certificates for the facility and the site to the FANC/AFCN. The clearance levels, controlled by the inspection organisation AVN, are as follows:

- Maximum  $0.4 \text{ Bq.cm}^{-2}$  surface contamination for  $\beta/\gamma$  emitters
- Maximum  $0.04 \text{ Bq.cm}^{-2}$  surface contamination for  $\alpha$  emitters
- The residual activity present in representative samples of the building material has to be of the same order of magnitude as that of similar building material from a non-nuclear zone at the site.

On compliance with these conditions, there may be partial or total withdrawal of the facility from regulatory control by the regulatory body.

#### 5.2.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The Royal Decree of 20 July 2001 is the legislation for radiation protection and the FANC/AFCN is the regulatory body.

5.2.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The criteria for exemption and clearance are defined in the Royal Decree of 20 July 2001, which are similar to those given in RP 112 except for the following isotopes: Te-131m, Te 134, Re-186, Np-239 for clearance.

5.2.15 Waste categorisation scheme

The Belgian waste classification system makes a distinction between short-term management (< 30 y) and long-term management (> 30 y). For the latter, the classification method is similar to the IAEA scheme. A more detailed description of the classification scheme can be found at <http://www.niras.be/>.

5.2.16 Waste disposal facilities within the country

There is no final waste disposal facility available within the country. There are, however, two temporary storage facilities: one at the site of Belgoprocess in Dessel and the other in Mol. The legal framework for the management of radioactive waste is set by the law of 8 August 1980 (as amended). Under this law, the national agency NIRAS/ONDRAF was established to oversee the management of radioactive wastes. The responsibilities of the Agency were further detailed in a Royal Decree of 30 March 1981 (as amended). NIRAS/ONDRAF is the organisation responsible for managing the facility. The waste acceptance criteria can be obtained from the web sites <http://www.niras.be/> or <http://www.belgoprocess.be/>. Belgoprocess is a subsidiary of NIRAS/ONDRAF, operating the centralised waste management facilities at two sites in Dessel and in Mol.

**Part III: Radiological Protection**

5.2.17 Radiological protection principles and standards

The radiological protection principles, as given in the Royal Decree, can be summarised as follows, i.e., the basic radiological standards are:

- (i) Justification
- (ii) Optimisation
- (iii) Dose limits:           Workers: 20 mSv per year  
  Public:     1 mSv per year.

5.2.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) are implemented in the national regulatory system since July 20, 2001.

**Part IV: Industrial Safety**

5.2.19 Regulatory body overseeing industrial safety

The Federal Ministry of Employment and Labour is the competent body for industrial safety. The full details of the industrial safety regulations can be obtained by e-mailing at [info@meta.fgov.be](mailto:info@meta.fgov.be).



#### 5.2.20 Statutory regulation controlling industrial safety

The Act of 4 August 1996 concerning the health and safety of workers is the basic Belgian legislation. Royal Decrees define the execution of this law.

### 5.3 Bulgaria

The information for Bulgaria was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

#### **Part I: Institutional and Legal Aspects**

##### 5.3.1 Primary legislation under which a nuclear licence is issued

The 'Act on the safe use of nuclear energy', promulgated in the State Gazette No. 63 of June 28, 2002 is the primary State legislation on the safe use of nuclear energy and ionising radiation and on the safety of radioactive waste and spent fuel management. The regulation for the procedure of issuing licences and permits for the safe use of nuclear energy are promulgated in the State Gazette No. 41, 2004.

##### 5.3.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Nuclear Regulatory Agency (NRA) located at 69 Shipchenski Prokhor Blvd., 1574 Sofia, Bulgaria is the regulatory body empowered to issue site licences. The NRA Chairman is authorized to issue site licences. The Chairman can issue separate permits for site selection, design, construction and commissioning of proposed nuclear facilities as well as permits for the modification and decommissioning of existing (licensed) facilities. He also issues a licence for the operation of a nuclear facility. All permits and licences are issued in accordance with the legislation (Section 5.3.1).

##### 5.3.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The NRA has the prime role of a nuclear regulator including issuing of regulatory guidance, granting licences/permits, execution of inspections and enforcement actions. All aspects of radiological protection are also covered.

The Ministry of Environment and Waters decides on Environmental Impact Assessments and has other responsibilities in overseeing the environmental protection during all kind of industrial activities, including decommissioning.

A Nuclear Facilities Decommissioning Fund under the auspices of the Minister of Energy and Energy Resources is established for the purpose of financing of the decommissioning of nuclear facilities.

The General Labour Inspectorate oversees the Industrial Safety regulatory aspects.

##### 5.3.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The regulatory policy is defined by establishing a special authorisation regime for the decommissioning of a nuclear facility as well as by legislative requirements for planning and execution of decommissioning, maintenance of adequate financial resources for decommissioning etc. The government policy consists of creating a national fund for the decommissioning of nuclear facilities (managed by the Minister for Energy) and incorporation of a strategy for the management of spent fuel and radioactive wastes arising from decommissioning activities.

5.3.5 Legal requirement for quality assurance in decommissioning

The ‘Act on the safe use of nuclear energy’ (ASUNE) - Regulation for the safety of the decommissioning of nuclear facilities comprises the legal requirements for quality assurance in decommissioning.

5.3.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The ‘Act on Environmental Protection’ came into force in September 2002. It was last amended in January 2005.

5.3.7 National policy defining stages of decommissioning of nuclear installations

There is no national policy defining stages of decommissioning. Decommissioning stages are specified in the decommissioning strategy document and later on in the decommissioning plan.

When differed dismantling is adopted as a decommissioning option, the stages are as follows: post-operation (implemented under the operating licence), preparation of safe enclosure, operation of safe enclosure, dismantling and site release. These activities are implemented under decommissioning permit(s). There is lack of requirements for the site release stage.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.3.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

A nuclear facility can only be decommissioned after the receipt of a decommissioning permit from the NRA chairman. In case the decommissioning of the nuclear facility is a multistage process, the NRA Chairman may issue a separate permit for each stage. Any permit/licence has mandatory terms and conditions such as the period of validity and other licence conditions. The regulation does not prescribe any generalised licence/permit conditions but specifies the mandatory attributes of a licence/permit as well as the areas in which conditions may be established.

5.3.9 Strategy specifying the approach to decommissioning

Such requirements are included in the ASUNE and developed in more detail in the Regulation for the safety of the decommissioning of nuclear facilities (promulgated in the State Gazette No. 73, 2004).

A decommissioning strategy needs to be developed at an early design stage and its inclusion as part of the safety analysis report is required for regulatory approval of the facility design. First a stand-alone decommissioning plan shall be submitted to the regulator along with the operating license application. A final decommissioning plan shall be submitted to the regulator three years before cessation of operation.

5.3.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

A Periodic Safety Report is not defined in the regulation. However, an updated safety report is required on completion of each decommissioning stage. In general, the national legislation does not allow a permit/license with a validity term of more than 10 years.

#### 5.3.11 Decay periods for radioactive materials within a particular stage of decommissioning

A case-by-case approach is followed such as a “delay and decay” period. The decay period is decided taking into account a series of factors such as doses and costs. Various stages are established in the decommissioning plan and approved by the regulator. A stage duration may be changed after approval by the regulator and when justified by operating experience and safety evaluations.

#### 5.3.12 Criteria for de-licensing a site

There is a lack of requirements/criteria and regulatory regime for site de-licensing. In general, the basic radiological criteria of  $10 \mu\text{Sv.y}^{-1}$  public dose shall be applied.

#### 5.3.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Liquids and gases are discharged to the environment in compliance with the limits and conditions specified by the regulator in the licensing process. Annual and monthly discharge activity limits are defined for a separate facility and for the entire site.

Solid materials shall be cleared from the site in compliance with the regulatory specification of clearance levels. However, specific clearance procedures have not yet been established and hence clearance is presently not practised.

#### 5.3.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The basic (dose) criteria follow the 96/29/Euratom EC Directive. Activity concentration clearance criteria follow the EU recommendations.

#### 5.3.15 Waste categorisation scheme

The IAEA waste categorisation scheme is followed.

#### 5.3.16 Waste disposal facilities within the country

No waste disposal facilities are in operation within the country. “Institutional” radioactive waste was disposed of in the Novi Han facility from 1960s to 1994. Partial Waste Acceptance Criteria (WAC) existed in terms of waste origin, physical waste form (no liquids, no flammables, no explosives) and alpha-activity limits (facility limit of 370 MBq/t and 3.7 GBq/t for a single waste package; more stringent limits were valid for Ra-226 and Th-232).

### **Part III: Radiological Protection**

#### 5.3.17 Radiological protection principles and standards

The European Basic Safety Standards are followed. The Nuclear Regulatory Agency (NRA) is the regulatory body (see Section 5.3.2 and Section 5.3.3).

#### 5.3.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The ‘Regulation for the basic norms for radiation protection’, promulgated in the State Gazette No. 73, 2004 is in force. Another legislation is the ‘Regulation for radiation protection during activities with sources of ionising radiation’.

## **Part IV: Industrial Safety**

### 5.3.19 Regulatory body overseeing industrial safety

The regulatory body overseeing “occupational safety” (may not fully cover “industrial safety”, which is not covered by the Bulgarian legislation) is the Executive Agency “General Labour Inspectorate” (GLI).

### 5.3.20 Statutory regulation controlling industrial safety

The ‘Law on Health and Safe Working Conditions’ was promulgated in the State Gazette No. 124/1997. In addition, there is secondary legislation. Further information can be obtained from the General Labour Inspectorate (GLI).

## **5.4 Cyprus**

The information for Cyprus was prepared mainly from documents available in the public domain.

Cyprus has no nuclear power generation capability and no plans are foreseen in this area.

However, the legislation in force, which is fully in line with the European acquis, covers all matters involving ionizing radiation, including decommissioning and, amongst others, provides for licensing of all sources and relevant practices.

## **5.5 Czech Republic**

The information for Czech Republic was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.5.1 Primary legislation under which a nuclear licence is issued

The legal framework for the siting, construction, commissioning and operation of nuclear installations is set out in the Atomic Act - Act No. 18/1997 Coll. on ‘Peaceful Utilisation of Nuclear Energy and Ionising Radiation’ and on Amendments and Additions to Related Acts, in the wording of the Act No. 13/2002 Coll. For decommissioning, a new decree was issued in June 2003 (Decree No. 185/2003 Coll., on the Decommissioning of Nuclear Installation or Category III or IV Workplaces (see [http://www.sujb.cz/docs/SUJB\\_CR\\_Atomic\\_Act.pdf](http://www.sujb.cz/docs/SUJB_CR_Atomic_Act.pdf)).

#### 5.5.2 National legislative/regulatory body empowered to issue a nuclear site licence

The State Office for Nuclear Safety (SÚJB) is the regulatory body set up under the Act No. 2/1969 Coll. It is empowered to issue licences, administer and supervise the use of nuclear energy and radiation protection under the Atomic Act (No. 18/1997 Coll.), where the conditions necessary to fulfil are described (vide § 9 of the Atomic Act). The SÚJB is a governmental body headed by a Chairman who is appointed by the Government of the Czech Republic.

#### 5.5.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The SÚJB is in charge of licensing activities as specified by the Act No. 18/1997 for siting and operation of nuclear facilities, for supervision of nuclear safety, for physical protection of nuclear facilities, for radiation protection and for emergency preparedness of nuclear

facilities. This organisation is also responsible for workplace handling of significant radiation sources and wastes, for transportation of radioactive materials and wastes. The SÚJB is the regulatory body responsible for administration and supervision of chemical weapons prohibition by the Act No. 19/1997 Coll., as amended in Act No. 249/2000 Coll. The SÚJB established the national body in the field of biological (bacteriological) and toxic weapons prohibition according to the government Decision No. 306/2000.

The Radioactive Waste Repository Authority (RAWRA) (Czech name: SÚRAO - Sprava Úložist RAdioaktivnich Odpadu) was established by decision of the Minister of Industry and Trade No. 107/97, issued in pursuance of Article 26 of Act No. 18/1997 Coll. The RAWRA is responsible for the safe disposal of radioactive wastes.

The Ministry of Environment is responsible for the environmental protection.

The State Labour Office is responsible for industrial safety.

#### 5.5.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

There is no defined national regulatory policy and/or Government policy. At present no nuclear facility is in the stage of decommissioning on the territory of the Czech Republic. However, the country follows the IAEA 3-stage decommissioning of NPPs. The decommissioning strategy is selected by the operator and is stated in the documents for licensing the site and also in the documents for decommissioning of the site.

According to the present decommissioning strategy for the nuclear facilities in the Czech Republic, the sites will be used for future commercial activities by the company itself. However, following completion of the decommissioning process, the facility will be exempt from the control of the Atomic Act, i.e., it is de-licensed and no further radiological supervision is considered to be necessary.

The implementation strategy for the decommissioning of a nuclear power plant (as proposed by ČEZ, the plant operator) is that following the removal of spent fuel from the fuel storage pond, there would be a period of safe enclosure (around 40 – 50 years) and then the main decommissioning activities such as decontamination, dismantling and land remediation would take place.

#### 5.5.5 Legal requirement for quality assurance in decommissioning

Considering the legal requirements for quality assurance in decommissioning, the following Decree is relevant:

- Decree of the SÚJB No. 132/2008 Coll., on Quality Assurance in Activities Related to the Utilisation of Nuclear Energy and in Radiation Activities, and Laying Down Criteria for the Assignment and Categorisation of Classified Equipment into Safety Classes.

#### 5.5.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The Act No. 100/2001 Coll. is the Act on the environmental impact assessment.

#### 5.5.7 National policy defining stages of decommissioning of nuclear installations

Decree No. 185/2003 Coll., on the decommissioning of nuclear installations or Category III or IV workplaces, describes the stages of the decommissioning process. These decommissioning stages include termination of operation, preparation for dismantling and dismantling itself. Regarding the decommissioning method, the decommissioning can be

performed in one stage according to an approved proposal of method for decommissioning. For individual decommissioning stages a licence is required.

## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.5.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

SÚJB is authorized to issue a site licence according to the Atomic Act (No. 18/1997 Coll.), in which the conditions are described that have to be fulfilled. The conditions itself are described in Atomic Act (18/1997 Sb.).

Documentation for issuing a licence for individual stages of decommissioning of a nuclear installation or Category III or IV workplaces shall contain:

1. Evidence of the availability of finance for the decommissioning activities
2. Description of changes to the local area due to the nuclear installation operation
3. Description of the technical procedures proposed for decommissioning
4. Decommissioning time schedule
5. Method of dismantling, decontamination, conditioning, transport, storage and elimination of parts of the installation contaminated by radio-nuclides
6. Assumed types and activities of radio-nuclides discharged into the environment and radioactive waste generated
7. Method of radioactive waste management, including its disposal
8. Limits and conditions for safe management of radioactive waste during the decommissioning process
9. Safety analyses
10. Scope and method of measurement and evaluation of exposure of exposed workers and other persons and contamination of the workplace and its vicinity by radio-nuclides and ionising radiation
11. On-site emergency plan
12. Evidence of provision of physical protection of the decommissioned nuclear installation.

- 5.5.9 Strategy specifying the approach to decommissioning

According to the Atomic Act 18/1997 Coll. the operator is required to specify the proposal for the decommissioning strategy in the documentation for issuing the licence for the individual stages of the nuclear installation commissioning. The final decommissioning plan shall be submitted to the SÚJB by the operator with the documentation for issuing the decommissioning licence (see Section 5.5.8).

- 5.5.10 Requirement for a Periodic Safety Report as decommissioning progresses

A Periodic Safety Report is not required. The concept of periodic safety reviews is implemented by the requirements of the Act No. 18/1997 Coll. on safety documentation scope and conditions of valid licences.

#### 5.5.11 Decay periods for radioactive materials within a particular stage of decommissioning

This depends on the strategy selected by the operator of the facility. For example, the Dukovany NPP and the Temelin NPP will be decommissioned to brown field site after a safe enclosure period.

#### 5.5.12 Criteria for de-licensing a site

The criteria are defined at the time of issuing the licence for the individual stages of decommissioning. For example, when the decommissioned site is not going to be further used for works with ionising radiation, the clearance levels must be reached.

#### 5.5.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The Atomic Act 18/1997 and the Decree No. 307/2002 Coll. as amended by the Decree No. 499/2005 Coll. are the overall regulation.

The General Rules for Radionuclide Discharge into the Environment (Decree No. 307/2002, § 56) describe:

- (1) The radio-nuclides may be discharged into the environment only if the radio-nuclide discharge is reasonable as indicated under Section 4 paragraph 2 of the Atomic Act. The methods of discharge must be chosen in such a way that human health and the environment shall not be endangered by radio-nuclide accumulation before the activity is naturally reduced by spontaneous radioactive decay to a level of insignificant exposure.
- (2) If a collective effective dose might exceed 1 Sv or the exposure in a critical group might exceed one twentieth of the general limits during a radio-nuclide discharge, the optimisation of radiation protection shall be demonstrated by a quantitative study in which the benefits and risks of the procedure being chosen shall be evaluated and a comparison with possible alternatives shall be performed.
- (3) The dose constraint for a total discharge of radioactive substances from a workplace where radiation activities are performed shall be an average effective dose of 250  $\mu$ Sv per calendar year for the appropriate critical group of the public, from which 200  $\mu$ Sv shall be for discharges into the atmosphere and 50  $\mu$ Sv for discharges into watercourses from nuclear installations.
- (4) Substances, materials and objects with a radio-nuclide content or surface radio-nuclide contamination that exceeds the clearance levels may be discharged into the environment in the scope and under the terms laid down in the licence for radio-nuclide discharge into the environment issued by the Office under Section 9 paragraph 1 h) of the Act and/or the other licences issued with the approval of the Office in compliance with the special legal regulations.

#### 5.5.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996) are followed.

#### 5.5.15 Waste categorisation scheme

The IAEA waste categorisation scheme is followed.

#### 5.5.16 Waste disposal facilities within the country

Repository Richard is the disposal facility for institutional RAW containing only artificial radio-nuclides (common criterion – 200 l drums, maximum effective dose rate at the surface of the drum 10 mSv/h, maximum weight 600 kg).

Repository Bratrství is the disposal facility for RAW containing only natural radio-nuclides (common criterion – 200 l drums, maximum effective dose rate at the surface of the drum 2 mSv/h, maximum weight of the drum 600 kg).

Repository Dukovany is the disposal facility for RAW from the operation of NPPs and institutional RAW (common criteria – 200 l drums, maximum effective dose rate at the surface of the drum 2 mSv/h, maximum weight of the drum 550 kg).

### **Part III: Radiological Protection**

#### 5.5.17 Radiological protection principles and standards

Radiological protection standards have been harmonised with the European BSS.

The general limits for the members of the public are 1 mSv per calendar year for the sum of the effective doses from external exposure and committed effective doses from internal exposure, or exceptionally 5 mSv for a period of five consecutive calendar years under the conditions laid down in the licence for Category III and IV workplace operation.

The limits for exposed workers shall be 100 mSv for a period of five consecutive calendar years as the sum of the effective doses from external exposure and committed effective doses from internal exposure and, exceptionally, 50 mSv in one calendar year as the sum of the effective doses from external exposure and committed effective doses from internal exposure.

The radiological protection principles and standards have been defined in the following Decree:

- Decree of the SÚJB No. 106/1998 Coll., on Nuclear Safety and Radiation Protection Assurance during Commissioning and Operation of Nuclear Facilities.

The SÚJB (State Office for Nuclear Safety) is the regulatory body for radiological protection.

#### 5.5.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The Decree No. 307/2002 Coll. as amended by the Decree No. 499/2005 Coll. covers the European BSS.

### **Part IV: Industrial Safety**

#### 5.5.19 Regulatory body overseeing industrial safety

The State Labour Inspection Office is the industrial safety regulatory body in Czech Republic. The Inspector General of the organisation is the responsible person. The website address is [www.suip.cz](http://www.suip.cz) (In Czech)

#### 5.5.20 Statutory regulation controlling industrial safety

The following two Acts are relevant:



- Act No 174/1968 Coll., on the state expert supervision on the work safety
- Act No. 258/2000 Coll., on the public health protection.

## 5.6 Denmark

The information for Denmark was prepared mainly from documents available in the public domain.

### **Part I: Institutional and Legal Aspects**

#### 5.6.1 Primary legislation under which a nuclear licence is issued

The Nuclear Installations Act No. 170 of 16 May 1962 is the primary legislation. An Executive Order of 1972 issued by the Ministry of Education under this Act provides that a licence is required for the possession of nuclear materials – defined as uranium, plutonium and thorium, unprocessed or processed. This licence is issued by the Energy Agency which replaced the Atomic Energy Commission. An Act on Nuclear Installations, Act No. 244 of 1976, was adopted in 1976. This Act was to replace the 1962 Act, but it never entered into force, as the 1985 Resolution prohibits the generation of nuclear power in Denmark. It would also be necessary that the Danish Parliament approve a new Act enforcing the provisions of the 1976 Act. The licensing procedure involves three permits – site approval, construction and operation.

The Radioactive Substances Act No. 94 of 31 March 1953 on the use of radioactive materials is the primary legislation involving nuclear and radioactive materials.

#### 5.6.2 National legislative/regulatory body empowered to issue a nuclear site licence

The licensing provision involves three permits – site approval, construction and operation – all granted by the Minister of Interior.

There are requirements for licences for the production, possession, import or use of radioactive substances, which are granted by the Board of Health under the radioactive Substances Act No. 94 of 1953. Permanent licences to hold and produce radioactive substances may be granted by the Board of Health to scientific institutes and university laboratories. Licences issued to hospitals using radioactive substances for diagnostic purposes are also granted by the Board of Health (Regulation No. 435 of 1974). Exceptions to the licensing rule are provided by a Decree of the Minister of the Interior for certain nuclear substances (Decree No. 546 of 1981).

#### 5.6.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The Parliament has agreed on the establishment of a new independent state company ‘Danish Decommissioning’ under the Ministry of Science, Technology and Innovation, which is responsible for decommissioning in compliance with the Operational Limits and Conditions set up by the Nuclear Regulatory Authorities. ‘Danish Decommissioning’ was established on 15 September 2003 under the parliamentary decision B48 of 13 March 2003. ‘Danish Decommissioning’ is to help prepare the basis upon which the Parliament can reach a decision about the design of a Danish final repository for low and intermediate level radioactive wastes (internet address: ‘Danish Decommissioning’: [http://www.ddcom.dk/ddcom\\_en/](http://www.ddcom.dk/ddcom_en/)).

Under the Nuclear Installations Act (1962), commissioning and operation of nuclear installations are subject to inspections by the Nuclear Regulatory Authorities ensuring compliance with the safety conditions such as operational limits and conditions of the licensing documents. The Nuclear Regulatory Authorities are: The Nuclear Office under the

Danish Management Agency and the National Institute of Radiation Hygiene under the National Board of Health.

#### 5.6.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

At present, Denmark has no nuclear power programme, although it has two small research reactors. In 1985, a Resolution of the Danish Parliament determined that nuclear energy will not be generated in Denmark and the sites that had been reserved for the construction of nuclear power plants were to be released. Consequently there are no nuclear power stations to be decommissioned in Denmark.

The overall policy and practice for radioactive waste management have so far been to collect and store all Danish radioactive waste (low and intermediate level waste) under safe and secure conditions at dedicated storage facilities at the Risø National Laboratory awaiting the decision on the decommissioning of the Danish nuclear facilities.

Concerning the establishment of a Danish disposal facility for low and intermediate level wastes, the Danish Parliament has in March 2003 agreed to start the work to establish a basis for decisions on a Danish disposal facility. This work will start with an assessment of the need for a revision of the legal basis including the question of an open and transparent decision process. The outcome of this preparatory work could be a recommendation to have a complete amendment of the regulatory framework in respect of the siting, construction, operation and closure of a disposal facility.

In March 2003, the Danish Parliament has agreed to the costs and the general decommissioning approach for all the nuclear facilities at Risø with the objective to decommissioning all nuclear facilities at Risø as soon as possible within a timeframe of 20 years.

#### 5.6.5 Legal requirement for quality assurance in decommissioning

The quality assurance at the Risø nuclear installations is traditionally based on the Nordic NARS system (Nordic Working Group in Reactor Safety Recommendations, 1975). For the new situation, after the closure of all installations, one part of the requirements set by the Nuclear Regulatory Authorities will be that the quality assurance system for the entire process of decommissioning including all radioactive waste management is based on international standards, which at present, for the general Quality Assurance will be DS/EN ISO 9001, version 2000. Additional requirements on complying with specific International Standards, e.g., for the competence of the laboratory characterising, measuring, handling and sorting of waste materials will also be set.

#### 5.6.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

A formal EIA (Environmental Impact Assessment) for a decommissioning project is not required in Denmark.

Prior to siting, construction and commissioning of a Danish disposal facility, the project will be subject to and Environmental Impact Assessment with public participation according to the Planning Act (2002) with underlying legislation which implements the European Council Directive 85/337/EEC and 97/11/EC. The assessment can be made either on a national level or on a regional level in the relevant counties. Alternatively it might be decided to make a specific project Act on the siting, construction and commissioning of the disposal facility in agreement with the Planning Act.

#### 5.6.7 National policy defining stages of decommissioning of nuclear installations

In Denmark, there is no national policy defining stages of decommissioning of nuclear installations.

In principle the Danish decommissioning follows the stages described by the IAEA (Safety Standards Series No. WS-G-2.1, 1999):

- Stage 1 – storage with surveillance
- Stage 2 – restricted site use
- Stage 3 – unrestricted site use.

#### **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

#### 5.6.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

For the existing Waste Management Plant (Risø) commissioned in the 50s decommissioning has not been considered during licensing.

Concerning the decommissioning of the nuclear facilities at Risø, the legal framework will continue to be the Nuclear Installations Act from 1962 with underlying legislation.

Concerning the establishment of a Danish disposal facility for low and intermediate level waste, the Danish Parliament has in March 2003 agreed to start the work to establish a basis for decisions on a Danish disposal facility. This work will start with an assessment of the need for a revision of the legal basis including the question of an open and transparent decision process. The outcome of this preparatory work could be a recommendation to have a complete amendment of the regulatory framework in respect of the siting, construction, operation and closure of a disposal facility.

The general decommissioning approach agreed to by the Danish Parliament includes an agreement on the total costs of the decommissioning of all nuclear facilities at Risø as soon as possible within a time frame of 20 years. The Parliament has also agreed on the establishment of a new independent state company ‘Danish Decommissioning’ under the Ministry of Science, Technology and Innovation being responsible for the fulfilment of the decommissioning in compliance with the Operational Limits and Conditions set up by the Nuclear Regulatory Authorities. ‘Danish Decommissioning’ is to help prepare the basis upon which Parliament can reach a decision about the design of a Danish final repository for low level and intermediate level radioactive waste.

#### 5.6.9 Strategy specifying the approach to decommissioning

The strategy for the management of the radioactive waste from the decommissioning of the nuclear facilities at Risø until decisions regarding disposal are made is to store the waste at Risø in newly designed and approved concrete containers in a new storage hall.

As a basis for decisions on a Danish disposal facility for low and intermediate level waste is not in place yet, it is too early to integrate a schedule for waste management into the decommissioning schedule. One important consideration for the decision to decommissioning all nuclear facilities at Risø as soon as possible within a time frame of 20 years has been to start the decommissioning activities while staff with experience from the operation of the research reactors is still present. It should be emphasized that the decommissioning project at Risø will be the only project of this kind to be conducted in Denmark.

#### 5.6.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

There is no requirement for a Periodic Safety Report (PSR) as decommissioning progresses.

#### 5.6.11 Decay periods for radioactive materials within a particular stage of decommissioning

For the decommissioning study of Risø's nuclear facilities, three scenarios have been considered:

- Scenario 1- "20 years scenario" (10 years cooling time for reactor DR 3) - Both the dismantling of external circuits and the final dismantling of facilities are compressed in time.
- Scenario 2- "35 years scenario" (25 years cooling time for reactor DR 3) - There is not much activity during the years 11 to 25, apart from a limited activity at the waste treatment plant, the maintenance of the safe store of DR 3 and possible transfer of stored waste to the final repository.
- Scenario 3- "50 years scenario" (40 years cooling time for reactor DR 3) - Foresees a very "silent" period from year 15 to year 40 with a limited activity at the waste treatment plant and the maintenance of the safe store of DR 3.

In all three scenarios the two small facilities, the fuel fabrication laboratory and the isotope laboratory, are decommissioned first. Both are considered as being only relatively lightly contaminated, and the buildings can be used for other purposes. Furthermore, it is assumed that Hot Cells, DR 1 and DR 2 are decommissioned during the first ten years in all scenarios.

The transfer of waste from the storages at Risø to the final repository can - more or less - be carried out at any time after the repository has been constructed. Irrespective of the scenario, after the end some activity will still take place either at the waste treatment plant or at the repository, receiving radioactive waste from other activities than Risø's.

#### 5.6.12 Criteria for de-licensing a site

No information is available relating to criteria for de-licensing a site.

#### 5.6.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

During the long operational period of the nuclear installations at Risø, the discharge limits have been expressed with reference to the dose limit for members of the public of 1 mSv/year and a prompt reporting requirement to the Nuclear Regulatory Authorities for expected or actual semi-annual releases exceeding ten times typical values over previous years.

For the decommissioning of the nuclear installations and for the continued operation of the Waste Management Plant during the decommissioning work, it is envisaged to issue revised Operational Limits and Conditions including the following requirements for discharge control and new discharge limits:

- Dose constraints of 0.05 mSv/a for individual installations at Risø and of 0.1 mSv/a for Risø as a whole. Annual discharge limits are based on a reference dose of 0.05 mSv/a
- Applying ALARA (e.g., Best Practicable Means) to limit the radioactive content of discharges
- Monitoring all discharges
- Routine reporting of discharges semi-annually to the Nuclear Regulatory Authorities, and

- Extraordinary reporting to the Nuclear Regulatory Authorities within 2 weeks when certain levels are or are expected to be exceeded.

Extraordinary reporting levels are based on the Expected (future) Annual Discharges (EAD). If a release during a month has exceeded or is expected to exceed the nuclide-specific EAD, an extraordinary report shall be prepared for the authorities. The report shall include a description of measures taken or to be taken to bring future discharges under control.

#### 5.6.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

Clearance of radioactive materials from the regulatory system is regulated by the Ministry of Interior under the Health Order No. 192 of 2 April 2002, on exemptions from the Act on the use etc. of radioactive materials (Annex 3):

1. Radioactive substances or materials containing radioactive substances may be cleared from their regulatory control, 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.
2. The special radiation protection requirements are defined, cf. article 12 in the Order, by the National Board of Health (National Institute of Radiation Hygiene) either in a specific authorisation or in regulations for a given area of application. The special radiation protection requirements shall ensure that:
  - a. The radiological risks to individuals caused by the cleared materials are sufficiently low
  - b. The collective radiological impact is sufficient low, and
  - c. The activity of the cleared materials from a radiation protection point of view is without significance, with no appreciable likelihood of scenarios that could lead to a failure to meet the criteria in (a) and (b).
3. For materials containing man-made radio-nuclides, the special radiation protection requirements shall, among others, be based upon, that the following dose criteria are met in all feasible circumstances:
  - a. 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
  - b. Either the collective committed effective dose per year due to the clearance is of the order of 1 man-Sv or less, or an assessment of the optimization of protection shows that clearance is the optimum solution.
4. For materials containing natural radio-nuclides, the special radiation protection requirements shall, among others, be based upon, that the following dose criteria are met in all feasible circumstances:
  - a. 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 radio-nuclides is less than 0.3 mSv per year.

#### 5.6.15 Waste categorisation scheme

The radioactive waste can be cleared from the regulatory system and treated as ordinary waste after adequate measurements and documentation in accordance with prescribed conditions given either in the legislation or in a specific licence. Solid radioactive waste stored at the approved storage facilities is categorized in accordance with the European Commission Recommendation of 15 September 1999 on a classification system for solid

radioactive waste (1999/669/EC, Euratom). This EU-recommendation is with exemption of the criteria for heat generation rate in high level waste, identical to the classification in IAEA Safety Series No. 111-G.1.1 on the Classification of Radioactive Waste.

#### 5.6.16 Waste disposal facilities within the country

At present no design or a potential site for a Danish LILW disposal facility has been chosen. In 2000 a working group under the Danish Ministry of Science, Technology, and Innovation prepared a report on theoretical considerations of technical requirements for a Danish disposal facility. In this report three design concepts were considered: near surface disposal (on the surface), sub-surface disposal (20-50 m below ground) and geological repository (200-300 m below ground). These design concepts could in principle be established in different types of waste matrix.

### **Part III: Radiological Protection**

#### 5.6.17 Radiological protection principles and standards

The radiological protection principles and standards are based on the European BSS.

#### 5.6.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The dose limits for workers are specified in the National Board of Health Order No. 823 of 31 October 1997 on dose limits for ionizing radiation and are included in the Operational Limits and Conditions for the nuclear installations at Risø.

### **Part IV: Industrial Safety**

#### 5.6.19 Regulatory body overseeing industrial safety

The Danish Working Environment Authority (WEA) of the Ministry of Employment is the authority which contributes to the health and safety at work places under the Working Environment Act and other Executive Orders by:

- carrying out inspection of companies
- drawing up of rules on health and safety at work
- providing information on health and safety at work.

The website is: <http://www.bm.dk/sw6496.asp>

#### 5.6.20 Statutory regulation controlling industrial safety

The Danish Working Environment Act was passed in 1999. The most recent amendment to the Act was adopted by the Danish Parliament in May 2004. The Act lays down the general objectives and requirements in relation to the working environment. The Act aims at preventing accidents and diseases at the workplace and at protecting children and young persons on the labour market through special rules. The main areas of the legislation are performance of the work, the design of the workplace, technical equipment, substances and materials, rest periods and young persons under the age of 18.

The Danish Working Environment Act is on a current basis supplemented by a number of Executive Orders, which further describe how the purpose of the Act can be achieved in specific areas. Executive Orders are rules of law which are legally binding on the enterprises and which usually contain rules on penal sanctions.

## 5.7 Estonia

The information for Estonia was prepared mainly from documents available in the public domain.

### **Part I: Institutional and Legal Aspects**

#### 5.7.1 Primary legislation under which a nuclear licence is issued

Estonia has no national nuclear energy programme, there are no nuclear power plants on its territory and consequently there is no nuclear licensing regime for nuclear power plants in the country. There are two partly decommissioned nuclear reactors and nuclear waste repositories in Paldiski (the former Soviet naval training centre). Estonia has, however, licensing provisions for activities involving ionising radiation.

The Radiation Act, promulgated by the President of Estonia on 8 May 1997 (after it had been adopted by the Parliament on 23 April 1997), is the legal instrument in the field of radiation protection for the workers, the public and the environment. It had been amended several times since then. This Act provides for a system of licensing covering all activities involving ionising radiation. The full text of this Act is available in the Supplement to the Nuclear Law Bulletin No. 61, June 1998.

#### 5.7.2 National legislative/regulatory body empowered to issue a nuclear site licence

The available information has been included in Section 5.7.1.

#### 5.7.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The Ministry of the Environment is the responsible organisation for environmental supervision, including radiation protection. The Estonian Radiation Protection Centre (ERPC), founded in January 1996 as a state agency under the Ministry of the Environment, is responsible for radiation protection including supervision and control of all radiological activities. Its responsibilities include:

- (i) issuing of licences
- (ii) regulation about radiation levels and assessment of exposure
- (iii) maintenance of dose registers and radiation source registers
- (iv) implementation of obligations under international conventions and agreements, and
- (v) management of systems for early warning and notification of radiological emergencies.

The Ministry of Social Affairs is responsible for the supervision of exposure of radiation workers and persons involved in medical exposure.

The Ministry of Internal Affairs is responsible for the internal security, emergency preparedness and management, and the protection of the public.

#### 5.7.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

There is no information available in the public domain regarding the national regulatory policy and/or Government policy for decommissioning of nuclear facilities.

5.7.5 Legal requirement for quality assurance in decommissioning

There is no information available in the public domain regarding the legal requirement for quality assurance in decommissioning.

5.7.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The Environmental Impact Assessment and Environmental Auditing Act came into force on 1 January 2001 which implements the EIADR.

5.7.7 National policy defining stages of decommissioning of nuclear installations

There is no information available in the public domain regarding the national policy defining stages of decommissioning of nuclear installations.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.7.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

This information was covered under Section 5.7.1.

5.7.9 Strategy specifying the approach to decommissioning

There is no information available in the public domain regarding the strategy specifying the approach to decommissioning.

5.7.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

There is no information available in the public domain regarding the requirement for a Periodic Safety Report as decommissioning progresses.

5.7.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no information available in the public domain regarding the decay periods for radioactive materials within a particular stage of decommissioning.

5.7.12 Criteria for de-licensing a site

There is no information available in the public domain regarding the criteria for de-licensing a site.

5.7.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The Radiation Act encompasses the basic concepts and principles of the EU Directive as well as the International Basic Safety Standards (IAEA Safety Series No. 115-1).

5.7.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

Under the Government Decree of 30 January 1998, the exemption levels and the clearance levels are specified.



#### 5.7.15 Waste categorisation scheme

To a large extent, the IAEA waste categorisation scheme is followed.

#### 5.7.16 Waste disposal facilities within the country

As mentioned in Section 5.7.1, the Paldiski site contains two partly decommissioned research reactors and a waste repository from the former Soviet naval programme. A state owned Radioactive Waste Management Agency, called the ALARA Ltd., had been established to manage the Paldiski site. In Sillamäe (northeast Estonia), there is a repository of uranium milling and mining waste from the former Soviet nuclear fuel cycle, which is one of the largest of its kind in Central and Eastern Europe. A private company, called SILMET, is responsible for the storage of waste at this facility. The Tammiku repository (near Tallin) for low and intermediate level waste has been closed.

### **Part III: Radiological Protection**

#### 5.7.17 Radiological protection principles and standards

The Radiation Act incorporates, amongst other provisions, the following important provisions:

- Justification of practices involving ionising radiation
- Optimisation of protection and safety
- Dose limitations
- Primary responsibilities of the licensee
- Transport of radioactive materials and wastes
- Radioactive waste disposal.

#### 5.7.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) are implemented in the national regulatory system under the Radiation Act, mentioned in Section 5.7.17.

### **Part IV: Industrial Safety**

#### 5.7.19 Regulatory body overseeing industrial safety

There is no information available in the public domain regarding a regulatory body overseeing industrial safety.

#### 5.7.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety.

## 5.8 Finland

The information for Finland was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.8.1 Primary legislation under which a nuclear licence is issued

The Nuclear Energy Act, issued on 11 December 1987 (990); amendments up to 769/2004 included, is the primary legislation for the use of nuclear energy, the implementation of nuclear waste management, the licensing and control of the use of nuclear energy (internet: [http://www.stuk.fi/en\\_GB/](http://www.stuk.fi/en_GB/)).

#### 5.8.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Finnish Government grants licences to construct and to operate nuclear facilities (nuclear power plants; fuel production, fabrication, use, handling and storage facilities; waste disposal facilities) as well as for mining and enrichment operations aimed at producing uranium or thorium. The construction of a nuclear facility requires a Government decision-in-principle (DiP). This decision-in-principle is applied for by submitting an application to the Government, on which the Ministry of Trade and Industry must obtain a preliminary safety assessment from the Radiation and Nuclear Safety Authority (STUK) and a statement from the Ministry of the Environment as well as from the municipal council of the municipality where the facility will be located. This decision-in-principle is given if the facility is judged to be in line with the overall good of the society and then it is forwarded to the Parliament who makes the final decision.

The Ministry of Trade and Industry (MTI) grants a licence for the use of nuclear energy. Granting of such licence may be delegated by decree to the Radiation and Nuclear Safety Authority (STUK).

#### 5.8.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The Ministry of Trade and Industry is the main responsible body.

Section 32 in the Nuclear Energy Decree requires that the construction licence application shall include a description of the effects of the nuclear facility on the environment and a description of the design criteria that will be observed by the applicant in order to avoid environmental damage and to restrict the burden on the environment. More detailed requirements are given in Government Decision 395/1991 and in Guide YVL 1.0.

The regulatory responsibilities in the area of nuclear waste management are set forth in the Nuclear Energy Act. According to Section 54 of the Act, the overall authority in the field of nuclear energy is the Ministry of Trade and Industry which has the responsibility of formulation of the national energy policy. Section 28 of the Act states that the Ministry shall decide, having consulted, when necessary, the Ministry of the Environment in the matter, the principles on the basis of which the waste management obligation is to be implemented. The Ministry prepares matters concerning nuclear energy, including the nuclear waste management, to the Government for decision-making and grants certain import and export licences for nuclear equipment and materials.

The STUK is an independent governmental organisation for the regulatory control of radiation and nuclear safety. The current Act on STUK was given in 1983 and the Decree in 1997.

In the area of non-nuclear waste management, the Ministry of Social Affairs and Health is the authority on the supervision of practices involving exposure to radiation.

5.8.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

This information is covered under Sections 5.8.3 and 5.8.9.

5.8.5 Legal requirement for quality assurance in decommissioning

Sections 35 and 36 of the Nuclear Energy Decree provide that quality assurance programmes for the design and construction as well as for operation of a nuclear facility are required to be submitted to STUK within the construction and operating licence application. The general quality assurance requirements apply to the whole life of a nuclear facility. According to the Government Decision 395/1991, quality assurance shall refer to all planned and systematic actions necessary to provide adequate confidence that a component, plant, or activity will satisfy given requirements. The Decision requires advanced quality assurance programmes to be employed in all activities which affect safety and relate to the design, construction and operation of a NPP including the waste management facilities within the facility. Similar requirement is included in the Government Decision 478/1999 on the safety of disposal of spent fuel.

5.8.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

This particular Council Directive has not been mentioned in the 2<sup>nd</sup> Finnish National Report. Before a licence for construction of a NPP, a spent fuel storage or a nuclear waste disposal facility or for any other significant nuclear facility can be applied, a decision-in-principle (DiP) by the Government is needed. An Environmental Impact Assessment (EIA) procedure has to be conducted prior to the application of the DiP and the EIA report annexed to the DiP application. Detailed requirements on the EIA procedure including public hearings are provided in the Act on the Environmental Impact Assessment Procedure (468/1994) and in the Decree on Environmental Impact Assessment Procedure (792/1994).

5.8.7 National policy defining stages of decommissioning of nuclear installations

This information has been included in Section 5.8.9.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.8.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

Section 19 of the Nuclear Energy Act states that sufficient and appropriate methods for arranging the decommissioning of a nuclear facility have to be identified before the construction licence is granted. Guide YVL 1.0 requires that provisions for decommissioning of the NPPs shall be made during the design phase. Limitation of radioactive waste generation and of the radiation exposure of workers and the environment arising from decommissioning shall be considered.

The general provisions for licensing and the waste management obligation included in the current nuclear energy legislation are adequate for regulating a decommissioning project. Only minor supplements will be sufficient to the Nuclear Energy Act and Decree. The Government Decisions related to nuclear and waste management safety are under revision and the provisions for decommissioning are planned to be included in the update. In

addition, an appropriate YVL-Guide (Safety regulation issued by STUK subject to nuclear energy legislation) will be developed by STUK. The update of the guide YVL 8.2 on clearance, which was planned for 2006, would cover the removal of control of materials arising from decommissioning of nuclear facilities and of previously licensed sites.

#### 5.8.9 Strategy specifying the approach to decommissioning

The four currently existing Finnish nuclear power units have been in operation for 25 to 28 years and are planned to be operated at least for two more decades. No nuclear power plants are being decommissioned and such decommissioning projects are neither foreseen in the near future. The current licence of the FiR 1 research reactor is valid until 2011. Nevertheless, the operator of FiR1, VTT Technical Research Centre of Finland has started a more detailed planning of the shutdown and decommissioning of the research reactor in preparation of the possible decision to close the facility. The decision to implement the plant is dependent on the outcome of efforts to arrange alternative, sustainable funding for continued operation of the research reactor.

According to the governmental policy decision of 1983 and later decisions by the Ministry of Trade and Industry, the licensees are obliged to prepare decommissioning plans for regulatory review and to update them every five years. These plans aim at ensuring that decommissioning can be appropriately performed when needed and that the estimates for decommissioning costs are realistic. The latest updates of the NPP decommissioning plans were published at the end of 2003. The next plan for the Olkiluoto NPP to be prepared by the end of 2008 will also include the decommissioning plan for Olkiluoto 3.

The decommissioning plans include assessments of occupational and off-site safety of the operations. They include rather detailed descriptions of the required dismantling and waste management operations and estimates of workforce and other resources needed. The plans are based on the actual designs of the nuclear facilities and they take into account the activity inventories in the facilities. The contamination levels in the facilities are followed by means of specific monitoring and recording programmes.

The cost estimates of decommissioning are depending on the amount of materials to be disposed as radioactive wastes and thus the limits to be applied for removal of material from control (clearance limits). The respective Guide YVL 8.2 is being revised to cover also bulk amount of wastes resulting from decommissioning and the premises for release of regulated sites.

The decommissioning plan for the NPP units Loviisa 1 and 2 is based on 50 years operation and immediate dismantling. Large and heavy reactor components, e.g., reactor pressure vessels and steam generators, will be removed intact without cutting them in pieces. The advantages of the method are saving of time and occupational radiation doses. Activated components accumulated during the operation will be packed into the reactor vessels which will serve as additional barriers. The waste will be disposed to Loviisa site by extending the current LILW repository.

The next decommission plan for Olkiluoto 1 and 2 units will be based on 60 years of operation and 30 years of safe enclosure. For Olkiluoto 3, immediate dismantling is considered as an option as well. As in the case of Loviisa, the reactor pressure vessels of Olkiluoto 1 and 2 are planned to be removed and disposed as such, in one piece at the Olkiluoto site.

The decommissioning plan of the research reactor FiR 1 is also updated every five year, the latest update being carried out in the year 2000. At the time this information was collected, a more detailed plan was going to be prepared in 2005. Studies are under way on the technical feasibility of disposing of the decommissioning wastes in one of the disposal facilities at the NPP sites.

#### 5.8.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

The conditions for granting a licence are prescribed in the Nuclear Energy Act (Sections 19-20). The operating licences of a nuclear facility are granted for a limited period of time, generally for 10–20 years. In case the operating licence is granted for longer periods than 10 years, a periodic safety review is required to be presented to the STUK. The comprehensive safety assessments for applications for the renewal of licences include updating safety relevant documents, amongst others plans for nuclear waste management, including decommissioning and disposal. In addition to the review of the above-mentioned documents, STUK has also made independent safety assessments and annually a number of regular and topical inspections to the facilities.

#### 5.8.11 Decay periods for radioactive materials within a particular stage of decommissioning

This information is given under Section 5.8.9.

#### 5.8.12 Criteria for de-licensing a site

This topic has not been mentioned in the 2<sup>nd</sup> Finnish National Report.

#### 5.8.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Some liquid and airborne discharges arise from the operation of 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. A systematic decrease in liquid discharges from NPPs has occurred during the past 10–15 years due to the adoption of efficient pre-treatment and radio-nuclide recovery methods. The actual radiation exposures in the environments of the NPPs are currently less than one per cent of the dose constraint. STUK Guide ST 6.2 on 1 July 1999 treats Radioactive Wastes and Discharges.

#### 5.8.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The Radiation Act and Decree were revised in 1991, taking into account the ICRP Publication 60 (1990 Recommendations of the International Commission on Radiological Protection). The Radiation Act and Decree were further amended in 1998 to be in conformance with the European Community Radiation Protection Legislation including the 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. At the time this information was collected, the Council Directive 2003/1227 Euratom of 22 December 2003 on the Control of High-Activity Sealed Radiation Sources and Orphan Sources was going to be implemented by 31.12.2005 by revising the Radiation Act and Decree accordingly.

Detailed safety requirements on the management of radioactive waste, subject to the Radiation Act, are provided in STUK's ST Guides. The responsible party running a radiation practice is obliged to ensure that the level of safety specified in the ST Guides is attained and maintained.

#### 5.8.15 Waste categorisation scheme

Nuclear waste is defined in Section 3 of the Nuclear Energy Act as radioactive waste in the form of spent fuel or in some other form, generated in connection with or as a result of the use of nuclear energy, and materials, objects and structures which, having become radioactive in connection with or as a result of the use of nuclear energy and having been

removed from use, requires special measures because of the danger arising from their radioactivity.

The main sources of radioactive waste are nuclear wastes generated from the operation of the four power reactors and the research reactor. Other radioactive waste arises from a number of facilities using radioisotopes in medical, research and industrial applications.

Respectively, the Finnish waste classification system includes two main categories: nuclear waste and radioactive waste not originating from the nuclear fuel cycle. Waste classification according to their disposal route is illustrated in Figure 5.8.1.

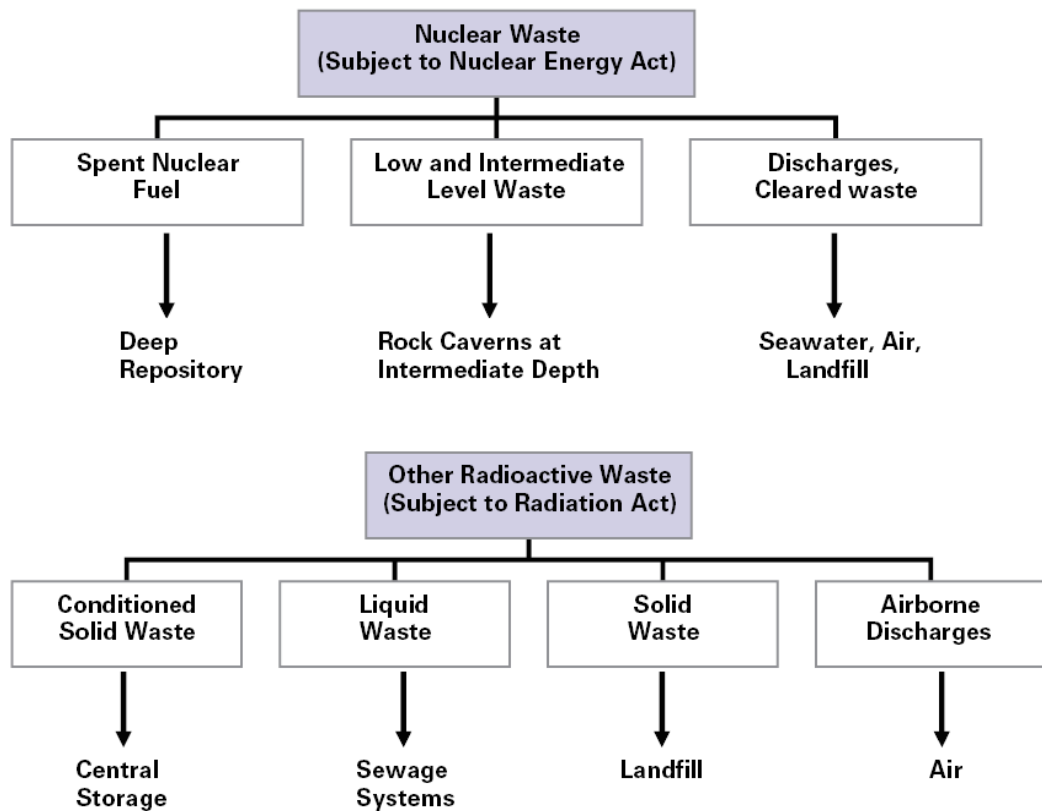


Figure 5.8.1 Classification of radioactive wastes for disposal purposes.

#### 5.8.16 Waste disposal facilities within the country

Figure 5.8.1 comprises details of the classification of radioactive wastes for disposal purposes. In Finland, waste is produced by the four reactors of the Loviisa and Olkiluoto nuclear power plants and by the research reactor at Otaniemi. The NPP utilities FPH (Fortum and Heat Oy) and TVO (Teollisuuden Voima Oy) have on-site pool-type interim storage facilities for spent fuel. Their capacities will be adequate until the end of this decade. Also FPH and TVO have rock cavern-type repositories for LILW. FPH's repository became operational in 1998 and TVO's in 1992. Both utilities also plan to dispose of decommissioning wastes in these repositories. A joint company of FPH and TVO, called Psiva Oy, is responsible for site selection and disposal of HLW.

### **Part III: Radiological Protection**

#### 5.8.17 Radiological protection principles and standards

The principles of justification, optimisation and dose limitation are included in Section 2 of the Radiation Act. The occupational dose limits and the dose limits for the general public are set out in Sections 3 to 5 of the Radiation Decree. These limits are in compliance with the ICRP 60 Recommendation (1990) and the Council Directive 96/29/EURATOM. According to Section 3 of the Radiation Decree the effective dose to a worker shall not exceed 20 mSv per year as an average over five years or 50 mSv in any single year.

#### 5.8.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

Basic requirements for the safe use of nuclear energy are given in the Nuclear Energy Act. Implementation of the Council Directive 96/29 EURATOM, medical surveillance of the employees of the NPPs and other working places where the employees are engaged in radiation work has been made since 1999. Reference to the Finnish Nuclear Energy Act is given in <http://www.stuk.fi/saannosto/19870990e.html>.

### **Part IV: Industrial Safety**

#### 5.8.19 Regulatory body overseeing industrial safety

The regulatory body overseeing industrial safety is the Ministry of Trade and Industry (MTI), Energy Department, Energy Management and Nuclear Energy Division.

#### 5.8.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety.

## **5.9 France**

The information for France was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.9.1 Primary legislation under which a nuclear licence is issued

The Law 61-842 of 2 August 1961 on atmospheric pollution and its application Decree 63-1228 of 11 December 1963 are the primary legislation. They concern the general regulations concerning licensing and control of basic nuclear installations including nuclear waste processing plants, interim storage facilities and nuclear waste disposal facilities. The Decree 63-1228 of 11 December 1963 provides for the authorisation decree to be followed by a series of licences issued at key points in plant lifetime: provisional licence for start-up of normal operation, final licence after several years of operation, decommissioning licences.

#### 5.9.2 National legislative/regulatory body empowered to issue a nuclear site licence

Under the Decree No. 73-278 of 13 March 1973, the French Nuclear Safety Authority, ASN (Autorité de Sureté Nucléaire) was established. The ASN is the regulatory authority responsible for nuclear safety and radiological protection. The ASN is entrusted with the definition and application of the regulations of the main nuclear facilities, known as the 'Basis Nuclear Installations (BNIs)', such as nuclear reactors, fuel cycle facilities, shutdown

facilities, waste treatment facilities, interim storage facilities and final repositories. Since 2002, it is also entrusted with the regulation for the remediation of sites and buildings and for the management of radioactive waste whatever its origin (hospitals, research and industry).

The ASN issues licences under the framework of the decree of 11 December 1963. The article 6 of the said decree, amended on the 19<sup>th</sup> January 1990, deals with the obligations of the operators during the decommissioning of BNIs. Prior to this amendment, there were no requirements specifically applicable to the decommissioning of nuclear installations.

5.9.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The ASN is the regulatory body for nuclear safety and radiological protection. It combines the resources of the Direction Générale de la Sûreté Nucléaire et de la Radioprotection (DGSNR) and the Divisions de Sûreté Nucléaire et de Radioprotection (DSNR) set up within the Regional Directorates for Industry, Research and the Environment (DRIRE). The DGSNR was set up by the Decree No. 2002-255 of 22 February 2002. The DGSNR reports to the Ministries of Industry and Environment on nuclear safety issues and to the Ministry of Health on radiation protection issues. The DGSNR was set up in 2002 by merging the Directorate for Nuclear Installation Safety (DSIN) with the former commission of artificial radio-nuclides (CIREA) to integrate the regulatory functions and implement government policies.

5.9.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The national policy on nuclear activities in France is that reliable, transparent and stringent management of activities must ensure the protection of individuals, the preservation of the environment and the limitation of burdens on future generations. It is the responsibility of the nuclear operators as waste producers to dispose of their waste in a suitable manner. The competent authorities regulate and control the nuclear activities.

5.9.5 Legal requirement for quality assurance in decommissioning

Legal requirements for quality assurance in decommissioning have been defined.

5.9.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

A national statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning is available.

5.9.7 National policy defining stages of decommissioning of nuclear installations

Although the principle of the three stages of decommissioning, as proposed by the IAEA, is followed, the timing, particularly with regard to the delay period between stage 2 and stage 3, is different. Previously a delay period of 50 years between stage 2 and stage 3 was practised, but now it is proposed to complete the stages of decommissioning work as soon as possible.



## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.9.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

The article issued on 19<sup>th</sup> January 1990 modified the procedures for the decommissioning of Basic Nuclear Installations (BNIs). Decommissioning has to comply with the requirements of the Law of 15<sup>th</sup> July 1975 regarding waste management and the Ministerial Order of 31<sup>st</sup> December 1999 regarding obligations to carry out waste management and the zoning of the facilities. An administrative note dated 9<sup>th</sup> November 1990 was issued to explain in details the procedure. A new administrative note on 17<sup>th</sup> February 2003 considered two main phases in a facility lifetime, each one corresponding to one licence: (a) operational phase, and (b) decommissioning phase.

- 5.9.9 Strategy specifying the approach to decommissioning

When a decision for cessation of normal operation of the facility is taken, the operator/licensee must inform the regulator of its intention. This must be done at least six months prior to carrying out any preparatory work such as the removal of fuel, removal of operational waste etc. and submit a safety case to the DGSNR. The DGSNR acknowledges the end of the operational phase.

- 5.9.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

A Decree is issued for a certain length of time. All work is carried out under the control and inspection of the DGSNR and its technical support team IRSN.

- 5.9.11 Decay periods for radioactive materials within a particular stage of decommissioning

Decay periods for radioactive materials within a particular stage of decommissioning are defined on a case by case basis.

- 5.9.12 Criteria for de-licensing a site

Criteria for de-licensing a site are defined on a case by case basis. There is no exemption or clearance level in France.

- 5.9.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The Government decree specifies the release authorisation. A public body, ANDRA (Agence Nationale pour les Déchets Radioactifs), was created under the Decree No. 92-1391 of 30 December 1992 for radioactive waste management.

- 5.9.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The principle of exemption and clearance levels does not apply in France.

- 5.9.15 Waste categorisation scheme

There is a variation of the IAEA waste categorisation scheme, although the main theme of segregation of waste into short-lived and long-lived is followed.

#### 5.9.16 Waste disposal facilities within the country

The Centre de la Manche for low level and medium level wastes was closed in 1994 when over 515,000 m<sup>3</sup> of waste was disposed. The Centre de l'Aube with a capacity of 1,000,000 m<sup>3</sup> for the same type of waste is in operation since 1993.

### **Part III: Radiological Protection**

#### 5.9.17 Radiological protection principles and standards

The ASN drawing on the expertise of the DGSNR is the regulatory body for nuclear safety and radiological protection. See also Section 5.9.3.

#### 5.9.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) have been implemented in the national regulatory system.

### **Part IV: Industrial Safety**

#### 5.9.19 Regulatory body overseeing industrial safety

No information regarding the regulatory body overseeing industrial safety was provided in the questionnaire, nor was there any information available in the public domain.

#### 5.9.20 Statutory regulation controlling industrial safety

No information regarding statutory regulation controlling industrial safety was provided in the questionnaire, nor was there any information available in the public domain.

## **5.10 Germany**

The information for Germany was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.10.1 Primary legislation under which a nuclear licence is issued

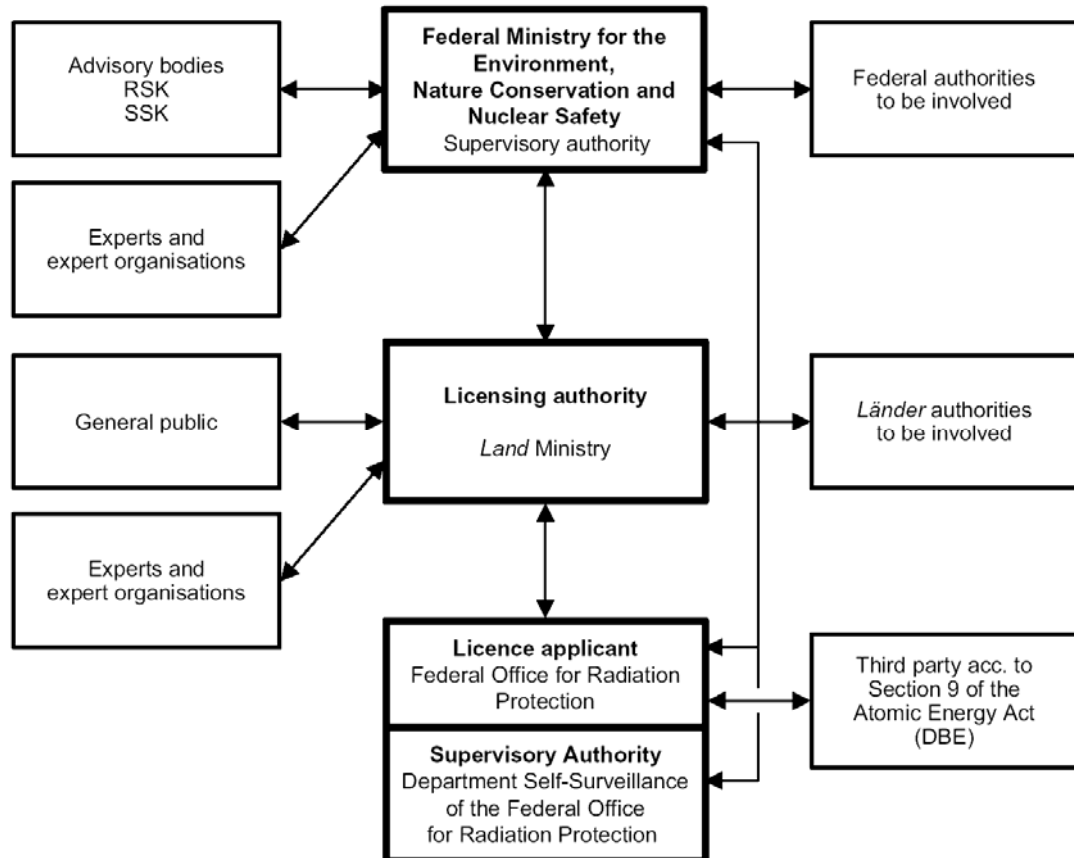
The original legislation in the form of the Atomic Energy Act of 23 December 1959 was amended and became effective on 27 April 2002 to reflect the federal government's policy to phase out nuclear energy for the generation of electricity in a structured manner. This amendment specifies that no further licences will be issued for commercial nuclear power plants in Germany and operational restrictions have been placed on all nuclear power plants (see Section 5.10.4).

#### 5.10.2 National legislative/regulatory body empowered to issue nuclear site licence

The Länder (Federal States) are empowered to execute administrative duties (licensing and supervision) under the nuclear and radiation protection law as delegated by the federal authorities. Thus, the Federal States are the competent licensing authorities for all nuclear installations within their territory, except for centralised and decentralised storage facilities for spent nuclear fuel. To ensure coherent implementation of the Atomic Energy Act, the Federal States are subject to federal supervision by the BMU (Bundesministerium für Umwelt, Naturschutz and Reaktorsicherheit – Federal Ministry of the Environment, Nature

Conservation and Nuclear Safety). The institutional framework for licensing and regulation of nuclear activities is shown in Figure 5.10.1. (In Germany, laws and ordinances are written in German and only the German wording is legally binding, even if an official translation does exist).

**Figure 5.10.1 Institutional Framework**



### 5.10.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The BMU (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit) is responsible for nuclear safety and radiation protection over all the Federal States. It is the competent body to issue directives and supervise the legality and expediency of the acts of authorities responsible for enforcing the Atomic Energy Act and the Radiation Protection Ordinance. The BMU also has exclusive power to issue guidance to the public in case of nuclear accidents/incidents. Apart from the BMU, the other federal ministries involved in nuclear matters are: BMBF (Federal Ministry of Education and Research), BMWa (Federal Ministry of Economics and Labour), BMF (Federal Ministry of Finance) and BMVBW (Federal Ministry of Transport, Building and Housing) (website: [www.bmu.de](http://www.bmu.de) and e-mail: [service@bmu.de](mailto:service@bmu.de)).

The BfS (Federal Office for Radiation Protection) implements on behalf of the BMU federal administrative tasks in the field of radiation protection as well as nuclear safety, the storage of nuclear fuel, the management of radioactive waste regarding, in particular, the construction and operation of federal installations for disposal. The BfS is the competent authority for licensing of the transport of nuclear fuel as well as for the licensing of storage of nuclear fuel outside government custody and the withdrawal or revocation of such licences. It also undertakes research in radiation protection, nuclear safety, transport of

radioactive substances, radioactive waste management and disposal (website: [www.bfs.de](http://www.bfs.de) and e-mail: [info@bfs.de](mailto:info@bfs.de)).

In matters of construction and operation of repositories, the BfS makes use of the DBE, a company founded under the Atomic Energy Act for the construction and operation of waste repositories. The DBE is the main contractor for the construction and operation of repositories.

The BAWA under the Federal Ministry of Economics and Labour is responsible for the issue of import and export licences of nuclear material.

#### 5.10.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

Following the 1998 federal elections, the coalition government made a political decision to irreversibly phase out nuclear energy for electricity generation. The nuclear policy agreement between the federal government and the utilities, signed on 11 June 2001, stated to limit future utilisation of the existing nuclear power plants. The most important part of the agreement refers to operational restrictions. For each installation the amount of energy it may produce is estimated from 1 January 2000 until its decommissioning. The average time of operation of a nuclear power plant is 32 years from the beginning of commercial operation. This new policy was incorporated in the amendment of the Atomic Energy Act which became effective on 27 April 2002. All nuclear power plants will be gradually closed down over a period of 20 years and then dismantled.

The policy the German government is aiming at is to dismantle immediately the nuclear installation, preferably to a 'green field' site. This immediate dismantling is also the present strategy of most of the plant operators where there are advantages from social and cost considerations and when qualified and trained staff is available. On the other hand, operators may choose to adopt the deferred dismantling option until a repository for radioactive waste is available. It is up to the operator to decide on the decommissioning strategy and in the past both options, i.e., immediate dismantling and deferred dismantling (safe enclosure with subsequent dismantling) have been followed.

#### 5.10.5 Legal requirement for quality assurance in decommissioning

The quality assurance programme for decommissioning follows the Länder (Federal States) requirements.

#### 5.10.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

This EC Directive has been transposed to an Act called Environmental Impact Assessment Act of September 2001.

#### 5.10.7 National policy defining stages of decommissioning of nuclear installations

As mentioned above in Section 5.10.4, the decommissioning strategy is chosen by the operator taking into consideration social and economic factors and manpower and skills availability aspects. Both options - immediate dismantling leading to green field status and deferred dismantling - have been practised by the operators in the past.

## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.10.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

In Germany, a separate licence for the decommissioning of a nuclear facility is required. This licence is offered by the same Federal State (Länder) regulatory body who issued the operating licence on the basis of an application by the operator. In practice, this provision may be implemented by a transfer from the operational licence to the decommissioning licence. After the shut down of a nuclear facility, nuclear fuel and all other residual radioactive material and waste arising from the operational phase are to be removed under the operational licence. This period is known as 'post-operational phase'. The decommissioning licence starts after that removal operation and continues until the site is released. In larger facilities, a stepwise licensing process may be applicable where the residual operation and the overall decommissioning preparation are carried out under the first licence.

- 5.10.9 Strategy specifying the approach to decommissioning

As mentioned in Section 5.10.8, the operational licence requires the removal of all fuel and operational material and waste from the facility. As regards to the implementation of the decommissioning option, there is no defined strategy. It is subject to practical considerations.

- 5.10.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

The operator needs to provide reports to the regulatory body at regular intervals. The responsibility for inspection and supervision lies with the respective Federal State (Länder) authority.

- 5.10.11 Decay periods for radioactive materials within a particular stage of decommissioning

The German practice is either to dismantle immediately or to defer dismantling. However, the deferred option is chosen not because of time requirement for radioactive materials to decay to manageable level but because of non-availability of a repository for waste disposal at present.

- 5.10.12 Criteria for de-licensing a site

The main parts for the regulation with regard to clearance of radioactive materials are the amendment to the Atomic Energy Act dated 22 April 2002 which contains the definition of 'radioactive material' and hence the basis for clearance levels and the Radiation Protection Ordinance (RPO) of July 2001 which contains specific regulations for clearance and a list of clearance levels. These regulations apply to clearance of materials and of sites. Besides the Atomic Energy Act and the Radiation Protection Ordinance, a number of technical standards and guidelines are relevant for clearance, in particular DIN 25457 (German Institute on Standardisation (Deutsches Institut für Normung – DIN) 'Activity measurement methods for the release of radioactive waste materials and nuclear facility components'). The licensee is, however, responsible for the choice of clearance options such as unconditional or conditional clearance (based on activity levels of radio-nuclides) and the implementation of suitable measurement procedures and quality assurance schemes. At the end of this clearance work, a radiological survey of the site is carried out by the licensee appointed radiation protection officer to assess compliance with regulatory requirements. After compliance has been verified, the site may be released and the materials may be reused, recycled or disposed of as required.

#### 5.10.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The regulatory control for the discharge of radioactive materials in any physical form is carried out under the German environment policy. The responsibility for inspection and supervision lies with the Federal State (Länder) authority and there is no difference between operational and decommissioning phases.

#### 5.10.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The European BSS have been transposed to the Radiation Protection Ordinance of July 2001 for implementation within the country.

#### 5.10.15 Waste categorisation scheme

The proper registration and description of waste is an essential pre-requisite of radioactive waste management. In accordance with the German approach to disposal, the definition and categorisation of radioactive waste (i.e., its classification) must comply with the requirements of safety of an underground repository. In this respect, the effects of heat generation from radioactive waste are particularly important when designing and evaluating a repository system, since the natural thermal conditions may be significantly altered by the deposited waste. In order to meet the requirements concerning the registration and categorisation of radioactive waste from the point of view of disposal, the authorities have chosen to move away from the previously used categories such as Low Active Waste (LAW), Medium Active Waste (MAW) and High Active Waste (HAW) and opted instead for a new categorisation. Initially, waste is subdivided into:

- heat-generating radioactive waste, and
- radioactive waste with negligible heat generation.

These two subdivisions are then followed by a detailed classification according to the categorisation scheme established for this purpose. This basic subdivision into heat-generating waste and waste with negligible heat generation is applicable not only for repository considerations but also for waste packages for disposal, particularly when such packages are stored for long-terms at a surface interim storage facility prior to transportation into a repository. This waste categorisation has not only proven expedient at national level, but is also applied internationally – e. g., by the Commission of the European Union. It is also compatible with the IAEA Safety Guide for qualitative categorisation [111 G-1.1] which additionally permits a further subdivision into short-lived and long-lived waste, thus allowing waste to be assigned to either “near-surface repositories” or “underground repositories”.

#### 5.10.16 Waste disposal facilities within the country

There is no operating waste disposal facility within the country. The Morsleben repository was operational from 1971 until 1998. Short-lived low and intermediate level radioactive wastes with alpha emitter concentrations up to  $4 \times 10^8$  Bq.m<sup>-3</sup> was disposed of in the repository. The total activity from  $\beta/\gamma$  emitters was about  $1.7 \times 10^{14}$  Bq and that of  $\alpha$  emitters was  $2.6 \times 10^{11}$  Bq. As a result of a court order, the disposal of waste was stopped in September 1998. The former Konrad iron mine was investigated for the disposal of all types of waste with negligible heat generation. The licensing process for the Konrad repository was started in August 1982. The BfS received the licence on 5 June 2002. The licence was sued at court and the BfS withheld the execution of the licence. The legal proceeding may last for several years. The Gorleben site was investigated for the disposal of all types of radioactive waste, including heat generating wastes in a salt dome at a depth of 840 m and 1200 m, since 1970s. The BMU issued a memorandum for the exploratory work on October

1, 2000 for a minimum period of 3 years and maximum period of 10 years. An agreement has been reached between the German power utilities and the Federal Government that fuel elements storage facilities will be constructed at the sites of all NPPs.

### **Part III: Radiological Protection**

#### 5.10.17 Radiological protection principles and standards

The BfS (Federal Office for Radiation Protection) is the competent authority for licensing of the transport of nuclear fuel as well as for the licensing of storage of nuclear fuel outside government custody and the withdrawal or revocation of such licences. It also undertakes research in radiation protection, nuclear safety, transport of radioactive substances, radioactive waste management and disposal (website: [www.bfs.de](http://www.bfs.de) and e-mail: [info@bfs.de](mailto:info@bfs.de)).

#### 5.10.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) have been implemented in the national regulatory system.

### **Part IV: Industrial Safety**

#### 5.10.19 Regulatory body overseeing industrial safety

The regulatory body overseeing industrial safety is the Federal Ministry for Labour and Social Affairs (BMAS) (website: <http://www.bmas.bund.de/BMAS/Navigation/arbeitsschutz.html>)

#### 5.10.20 Statutory regulation controlling industrial safety

The industrial safety regulations may be found in the compendium of regulations for industrial safety at the website of the Federal Ministry for Labour and Social Affairs (BMAS) (website: <http://www.bmas.bund.de/BMAS/Navigation/Arbeitsschutz/gesetze.html>).

Some of the most important regulations are:

- Occupational Safety & Health Act (Arbeitsschutzgesetz)
- Act on the Safety of Apparatuses and Products (Geräte- und Produktsicherheitsgesetz) with 14 subsidiary ordinances
- Occupational Safety & Medicine Act (Arbeitssicherheitsgesetz)
- Act on Hazardous Substances (Chemikaliengesetz)
- Ordinance for the Safety of Construction Sites (Baustellenverordnung).

## **5.11 Greece**

The information for Greece was prepared mainly from documents available in the public domain.

### **Part I: Institutional and Legal Aspects**

#### 5.11.1 Primary legislation under which a nuclear licence is issued

Licensing regimes covering nuclear power plants, facilities for producing nuclear fuels, waste storage facilities etc. are governed by the Decree Law 854 of 15 March 1971.

Presidential Decree No. 610 of 23 August 1978, adopted in pursuant to Decree Law No. 854, lays down the conditions and procedures for the issue of site licences for nuclear installations. Licensing of laboratories for non-medical applications is done under the 1991 Radiation Protection Regulations.

5.11.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Minister for Development is the competent authority for the licensing and control of nuclear installations. In accordance with Decree Law No. 854, the licensing procedure consists of four main stages:

- Site licence
- Construction licence
- Licence for pre-operational testing, and
- Operating licence.

The licences are granted in succession by the Minister for Development following recommendations from the Greek Atomic Energy Commission (GAEC). The GAEC gives further details of licence conditions (<http://143.233.238.6/en/legislation/index.html>).

The licences of laboratories for non-medical applications are also granted by the Minister under the 1991 Radiation Protection Regulations.

5.11.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

There are no decommissioning activities in Greece. However, the general safety conditions are laid down by the joint orders of the Minister for Development and the Minister for Health and Welfare.

The Greek Atomic Energy Commission (GAEC) is the regulatory body for radiological protection.

5.11.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

There are no decommissioning activities in Greece.

5.11.5 Legal requirement for quality assurance in decommissioning

There are no decommissioning activities in Greece.

5.11.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

Greece has not disposed of radioactive wastes, medical or otherwise, and has no plans for setting up disposal facilities.

Greece has implemented the requirement for the implementation of the European Council Directive 97/11/EC of 3 March 1997. The national regulation can be found in the Radiation Protection Regulation (<http://143.233.238.6/el/legislation/regulations.pdf>).

5.11.7 National policy defining stages of decommissioning of nuclear installations

There are no decommissioning activities in Greece.



## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.11.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

This information has been given in Section 5.11.2.

- 5.11.9 Strategy specifying the approach to decommissioning

There are no decommissioning activities in Greece.

- 5.11.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

There are no decommissioning activities in Greece.

- 5.11.11 Decay periods for radioactive materials within a particular stage of decommissioning

This principle is not applicable in Greece.

- 5.11.12 Criteria for de-licensing a site

There are no decommissioning activities in Greece.

- 5.11.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Discharges are authorised by the Greek Atomic Energy Commission (GAEC) under the Radiation Protection Regulation promulgated jointly by the Ministers for the National Economy, Employment, Health and Welfare, and Development in agreement with the European BSS and EC Directive 97/42/Euratom of 30 June 1997 on the health protection of individuals against the dangers of ionising radiation in relation to medical exposure. Further details can be found in the website: <http://143.233.238.6/el/legislation/regulations.pdf>.

- 5.11.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996) are followed.

- 5.11.15 Waste categorisation scheme

From the available National Regulations (<http://143.233.238.6/el/legislation/regulations.pdf>), it is not clear whether Greece has adopted the IAEA waste categorisation scheme or not.

- 5.11.16 Waste disposal facilities within the country

A 5 MW swimming pool type reactor is in operation at the National Research Centre “Demokritos”. There is a local temporary storage facility for the spent fuel and under agreement, fuel is going to be sent to the USA.

Provisions for the safe management of radioactive wastes from medicine, industry, research and other applications of radioisotopes are included in the radiation protection regulations. An interim storage facility exists at the National Research Centre “Demokritos”.

A centralised storage facility for spent sealed sources is envisaged. At the moment the Greek AEC, the responsible authority, requires that spent sources be returned to the supplier. Spent fuel from the research reactor at “Demokritos” is returned to the supplier.

### **Part III: Radiological Protection**

#### 5.11.17 Radiological protection principles and standards

The radiological protection principles and standards in Greece are the same as those required under the European BSS.

#### 5.11.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

Greece has implemented the EC Council Directive 96/29/Euratom of 13 May 1996. See also Section 5.11.14 for additional details.

### **Part IV: Industrial Safety**

#### 5.11.19 Regulatory body overseeing industrial safety

There is no information available in the public domain regarding a regulatory body overseeing industrial safety.

#### 5.11.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety.

## **5.12 Hungary**

The information for Hungary was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.12.1 Primary legislation under which a nuclear licence is issued

On 10 December 1996, the Hungarian Parliament adopted the Atomic Energy Act, CXVI, which replaced the Atomic Energy Act of 1980. The 1996 Act, while preserving the essential elements of the 1980 Act, aims to conform to more recent international recommendations and guidelines as issued by the IAEA and the NEA/OECD. The Act came into force on 1 June 1997 (<http://www.nea.fr/html/law/nlb/60-hungary.pdf>).

The basic points of the Act are:

- defines and allocates the tasks of ministries, national authorities and bodies of competence in licensing and supervising procedures.
- declares the organisational and financial independence of the licensing and supervising authorities.
- outlines the general framework for the utilisation of human resources, education, research and development.
- defines the responsibility of the licensee for all nuclear damage, and fixes the sum of liability in accordance with the revised Vienna Convention.
- entitles the Authority to impose fines should rules be infringed.
- requires that the Government appoints - as it is in the national interest - an organization responsible for the final disposal of radioactive waste, for the interim

storage and final disposal of spent fuel, and for the decommissioning of nuclear installations.

#### 5.12.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Hungarian Atomic Energy Authority (HAEA) is the relevant authority for the regulation of atomic energy in Hungary. It regulates the licensing of nuclear facilities and coordinates the activities of other ministries and administrative bodies. The Prime Minister appoints the Director General and the Deputies of the HAEA. The Director General is the person responsible for issuing nuclear licences. The Government exercises supervision of the HAEA through the Minister of the Interior. The HAEA contains two directorates: the Nuclear Safety Directorate and the General Nuclear Directorate.

Under the Government Decree No. 108/1997, which entered into force on 25 June 1997, the Parliament's consent is required for the establishment of a new NPP or a new unit within the existing plant, as well as to acquire the ownership of an operating NPP.

At present, there is one nuclear power plant in Hungary. It is located at Paks on the Danube and has four units (VVER-440 reactors) with a total capacity of 1840 MWe.

#### 5.12.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

There are two more specific issues in Hungary defined by the Act CXVI of 1996 on Atomic Energy:

- One of them is the definition of nuclear facilities. The definition in the Act is based on that applied in the safeguards agreement between Hungary and the International Atomic Energy Agency. It states that only those facilities are classified as nuclear facilities in which the amount of nuclear material used in the facility is above a certain limit. This means that radioactive waste management facilities (e.g., repositories) are not considered as nuclear facilities.
- The other specific issue is that the Act establishes a so-called divided authority and regulatory system.

The Nuclear Safety Directorate of the HAEA issues permits for siting, construction and enlargement, commissioning, operation, modification, permanent shutdown and decommissioning of nuclear facilities. Apart from issuing standard and regulatory permits, the Directorate is also responsible for quality assurance inspections at licensees' and suppliers premises.

The General Nuclear Directorate of the HAEA, through its Department of Nuclear and Radioactive Materials, runs the accountancy (Central Registry of Radioactive Materials) and control of nuclear materials, from production to final disposal as radioactive waste.

Under the Decree No. 2414/1997, the Director General of the HAEA established the Public Agency for Radioactive Waste Management (PURAM) for the collection, treatment, storage and disposal of radioactive waste. PURAM's responsibilities cover both small scale producers in the fields of medicine, industry and research, and waste from the Paks NPP.

The Minister of Health, Social and Family Affairs is responsible for the licensing and control of ownership, use, production, storage and distribution of radioactive materials, and for the use of equipment generating ionising radiation. The Minister has the power to licence and monitor radioactive waste disposal facilities and to supervise the radiation protection services and matters related to radiation hygiene.

The Minister of Environment and Water Management is the competent authority for environmental protection, nature conservation and water quality protection.

The radiological protection issues (radiation protection of employees and the public) are dealt with by various regional competent bodies (Regional Radiological Centres) of the National Public Health and Medical Officer Service. Environmental protection is covered by the National Public Health and Medical Officer Service.

Industrial safety is generally covered by the Minister of Health, Social and Family Affairs.

With regard to the geological aspects in radioactive waste management, the Ministerial Decree 62/1997 (XI. 26.), issued by the Minister of Industry, Trade and Tourism, prescribes the methodology and the geological requirements of site selection and characterization.

5.12.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

A national regulatory policy and/or Government policy for decommissioning of nuclear facilities does not exist.

5.12.5 Legal requirement for quality assurance in decommissioning

Under the Atomic Energy Act and the Governmental Decree 89/2005 (V.5.), all nuclear facilities are required to follow an appropriate quality assurance system. The legally binding safety codes also contain prescriptions on the functioning of the licensee's safety system based on the Quality Assurance Safety Code of the International Atomic Energy Agency. All organisations contracted by the licensee and working on safety-classified structures, systems and components are obliged to maintain a quality assurance system. The licensee has the responsibility of qualifying contractors as suitable for the assigned task. The Hungarian Atomic Energy Authority is empowered by law to inspect the effectiveness of any given quality assurance system. The aspect of quality management is taken into account in the licensing process as well as in the supervision of adherence to prescriptions. The Public Agency for Radioactive Waste Management introduced a quality management system that was officially certified in accordance with ISO 9001:2000.

5.12.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

Decree No. 32/2001 of 14 February 2001 regulates in detail the environmental impact assessment. It specifically mentions compliance with the Council Directive 85/337/EEC of 27 June 1985 and 97/11/EC of 3 March 1997.

5.12.7 National policy defining stages of decommissioning of nuclear installations

This information was given in Section 5.12.3.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.12.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

For decommissioning, a multi-step licensing procedure is established, where the first step is to obtain the authorities' consent to terminate operation. A further requirement is a valid environmental protection license based on an environmental impact assessment and public hearing. In that respect, Governmental Decree 240/1997 (XII. 18) treats the establishment of the organisation designated for implementing the disposal of radioactive wastes and spent fuel, as well as decommissioning of nuclear installations, and on the financial source for performing tasks.

5.12.9 Strategy specifying the approach to decommissioning

There is no strategy specifying the approach to decommissioning.

5.12.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

A Periodic Safety Report (PSR) is required to be submitted by the licensee to the Authority, as part of the operating safety requirement. However, there is no specific time span for the PSR in the regulation, nor is it clear that a PSR is required as part of the decommissioning procedure.

5.12.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no indication of requirements for a decay period.

5.12.12 Criteria for de-licensing a site

Criteria for de-licensing a site are not mentioned in the Hungarian National Report. However, general requirements for exemption and clearance criteria for nuclear wastes have been mentioned.

5.12.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

A dose constraint came into force in 1998. The Decree 15/2001 (VI. 6) of the Minister of Environment prescribed generic isotope selective limitations derived from the dose constraint.

5.12.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

Exemption levels are regulated in accordance with the regulations of the European Union, by the Decree 23/1997 (VII 18.) of the Minister of Health. The procedure of clearance from regulatory control is regulated by the Decree 16/2000 (VI. 8) of the Minister of Health. According to this Decree, materials can be released from regulatory control if the projected annual individual dose originating from its re-use, recycling or handling as non-radioactive waste does not exceed 30 microSv of effective dose, and analysis proves that clearance is the optimum solution.

5.12.15 Waste categorisation scheme

Hungary follows its own waste categorisation scheme. The classification of the radioactive waste into low and intermediate levels, for a single radio-nuclide, is based on the activity-concentration and the exemption activity-concentration (EAC) of the radioisotope concerned, as in Table 1.

Table 1. Classification of radioactive waste for one radioisotope

<b>Radioactive waste class</b>	<b>Activity concentration (Bq/g)</b>
Low level	1 EAC – 10 <sup>3</sup> EAC
Intermediate level	> 10 <sup>3</sup> EAC

If the radioactive waste contains more than one radio-nuclide, then the classification is based on the following scheme, as shown in Table 2.

Table 2. Classification of radioactive waste for more than one radioisotope

Radioactive waste class	Activity concentration ratio
Low level	$SUM(C_i/EAC_i) \leq 10^3$
Intermediate level	$SUM(C_i/EAC_i) > 10^3$

where  $C_i$  is the activity-concentration of the  $i^{\text{th}}$  radionuclide in the radioactive waste, while the  $EAC_i$  is the exemption activity-concentration of the  $i^{\text{th}}$  radionuclide.

#### 5.12.16 Waste disposal facilities within the country

The Solymár repository which used to accept, in the absence of acceptance criteria, almost all kinds of wastes, ceased operation since 1980. Between 1979 and 1980, radioactive wastes stored up till then in a facility in Solymár were transferred for disposal to the Radioactive Waste Treatment and Disposal Facility.

### **Part III: Radiological Protection**

#### 5.12.17 Radiological protection principles and standards

The dose limits and safety standards are in accordance with the IAEA Basic Safety Standards. The State Public Health and Medical Officer's Service supervises and approves radiation protection standards submitted by the nuclear installations.

#### 5.12.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) have been implemented in the national regulatory system.

### **Part IV: Industrial Safety**

#### 5.12.19 Regulatory body overseeing industrial safety

Industrial safety is generally covered by the Ministry of Health, Social and Family Affairs. Information about the statutory regulations controlling industrial safety, was not obtained.

#### 5.12.20 Statutory regulation controlling industrial safety

Industrial safety is generally covered by the Ministry of Health, Social and Family Affairs. Information about the statutory regulations controlling industrial safety, was not obtained.

## **5.13 Ireland**

The information for Ireland was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.13.1 Primary legislation under which a nuclear licence is issued

There are no nuclear power plants or nuclear fuel cycle facilities in Ireland and consequently there are no commissioning and decommissioning licensing regimes in the country.

5.13.2 National legislative/regulatory body empowered to issue a nuclear site licence

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The Radiological Protection Institute of Ireland (RPII) has the responsibility over all matters relating to the protection of workers and public from ionising radiation in Ireland. It carries out its responsibilities under the framework of the Radiological Protection Act, 1991 (Ionising Radiation) Order 2000, Statutory Instrument No. 125 of 2000.

The Environmental Protection Agency (EPA) is an independent public body established under the Environmental Protection Agency Act, 1992. The other main instruments from which it derives its mandate are the Waste Management Act, 1996, and the Protection of the Environment Act, 2003. The EPA has a wide range of functions to protect the environment. Its primary activities include:

- Environmental licensing
- Enforcement of environmental law
- Environmental planning and guidance
- Monitoring and reporting on the environmental status – air, water, waste, noise, land and soil
- Environmental research.

The Health and Safety Authority (HSA) is the national body in Ireland with responsibility for securing health and safety at work. It is a state-sponsored body, established under the Safety, Health and Welfare at Work Act, 1989 and it reports to the Minister for Enterprise, Trade and Employment.

5.13.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.5 Legal requirement for quality assurance in decommissioning

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The EPA is responsible for the protection of the environment and the implementation of international obligations on environment. Its primary activities include:

- Environmental licensing
- Enforcement of environmental law
- Environmental planning and guidance
- Monitoring and reporting on the environmental status – air, water, waste, noise, land and soil
- Environmental research.

The Office of Environmental Enforcement (OEE) within the Environmental Protection Agency (EPA) is entrusted with the implementation and enforcement of environmental legislation in Ireland.

5.13.7 National policy defining stages of decommissioning of nuclear installations

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.13.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.9 Strategy specifying the approach to decommissioning

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.11 Decay periods for radioactive materials within a particular stage of decommissioning

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.12 Criteria for de-licensing a site

Considering there are no nuclear power plants or nuclear fuel cycle facilities in Ireland, this issue is not applicable.

5.13.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The disposal of radioactive material is regulated through the issue of a licence for such an activity. The licensing system is set out in law in the Radiological Protection Act, 1991 (Ionising Radiation) Order, 2000, Statutory Instrument No. 125 of 2000.

5.13.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The exemption criteria as defined in the European Basic Safety Standards are followed. There is no provision in the law for specific clearance criteria.

5.13.15 Waste categorisation scheme

Given the nature of the activities involving ionising radiation in Ireland, it has been convenient to define waste as either sealed or unsealed sources and then in terms of half-lives.



#### 5.13.16 Waste disposal facilities within the country

There are no radioactive waste disposal facilities within the country.

### **Part III: Radiological Protection**

#### 5.13.17 Radiological protection principles and standards

The RPII is responsible for the radiological protection within the country. In particular its main objectives are:

- To provide advice to the Government, the Minister for the Environment and Local Government and other Ministers on matters relating to radiological safety
- To provide information to the public on any matters relating to radiological safety which the Institute deems fit
- To maintain and develop a national laboratory for the measurement of levels of radioactivity in the environment, and to assess the significance of radiation levels for the Irish population.
- To provide a personnel dosimetry and instrument calibration service for those who work with ionising radiation.
- To regulate by licence the custody, use, manufacture, importation, transportation, distribution, exportation and disposal of radioactive substances, irradiating apparatus and other sources of ionising radiation.
- To assist in the development of national plans for emergencies arising from nuclear accidents and to act in support of such plans.
- To provide a radioactivity measurement and certification service.
- To prepare codes and regulations for the safe use of ionising radiation.
- To carry out or promote research in relevant fields.
- To monitor developments abroad relating to nuclear installations and radiological safety and to keep the Government informed of their implications for Ireland.
- To co-operate with the relevant authorities in other states and with appropriate international organisations.
- To represent the State on international bodies.
- To be the competent authority under international conventions on nuclear matters.

#### 5.13.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The RPII carries out all activities related to radiation protection in Ireland under the Radiological Protection Act, 1991. But it is not clear whether the safety standards are in agreement with the European or International BSS.

### **Part IV: Industrial Safety**

#### 5.13.19 Regulatory body overseeing industrial safety

The Health and Safety Authority (HAS) is the national body in Ireland with responsibility for securing health and safety at work.

### 5.13.20 Statutory regulation controlling industrial safety

The principal functions of the Health and Safety Authority as set out in its Corporate Plan 2003- 2007 are as follows:

- To monitor and enforce compliance with occupational health and safety law
- To provide information and expert advice to employers, employees and the self-employed
- To promote workplace safety, health, welfare, education and training
- To publish research on workplace hazards and risks
- To propose new regulations and Codes of Practice to the Minister.

The main Regulations and Orders made under the Safety, Health and Welfare at Work Act, 1989 are:

- Safety, Health and Welfare at Work Act, 1989 (Commencement Order, 1989), S.I. No. 236.
- Safety, Health and Welfare at Work (General Application) (Amendment No. 2) Regulations, 2003, (Amends S.I. No. 44 of 1993), S.I. No. 53.
- Safety, Health and Welfare at Work (Explosive Atmospheres) Regulations 2003, S.I. No. 258.
- Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2003 (Amends S.I.No. 481 of 2001) S.I.No. 277.

The Health and Safety Authority's inspectorate enforce legislation on occupational safety, health and welfare. In addition to rights of entry, inspection and sampling an inspector may:

- issue an Improvement Direction, to which an employer is required to respond with an Improvement Plan in relation to activities to which the inspector considers may involve risk to safety or health of persons.
- issue an Improvement Notice stating his opinion that, an employer has broken a provision of an Act or Regulation.
- issue a Prohibition Notice in relation to an activity, which the inspector is of the opinion, has been or is likely to be a risk of serious personal injury to persons at work. This might require an immediate stoppage of work.
- in certain cases recommend the initiation of prosecutions.
- give directions or instructions.

## 5.14 Italy

The information for Italy was prepared mainly from documents available in the public domain.

### **Part I: Institutional and Legal Aspects**

#### 5.14.1 Primary legislation under which a nuclear licence is issued

At present, in Italy there are no operating nuclear power plants. All the nuclear power plants (Garigliano 150 MWe BWR, Latina 150 MWe GCR, Trino 260 MWe PWR and Caorso 860 BWR) are at various stages of decommissioning.

The Law No. 1860 issued in 1962 is the Basic Act on the use of nuclear energy which was amended by the Presidential Decree No. 1704 of 1965 and then by another Presidential

Decree No. 519 of 1975. Excluded from the scope of this Law are the nuclear installations for the generation of electricity, which is governed by the Legislative Decree No. 230/95.

#### 5.14.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Ministry of Productive Activities (MAP) is the regulatory body. The APAT, created in October 2002 from the previous organisation ANPA, acts as the technical body for the MAP and it carries out technical and scientific, regulatory and inspection activities related to the protection of the environment, land resources and the water. APAT's responsibilities in the licensing process of nuclear installations include:

- Assessment of the safety cases presented by the licence applicant
- Inspection of equipment and materials during construction and operation
- Enforcement action in case of any failure to meet licence conditions and operational safety criteria.

Licences related to nuclear installations and radioactive materials are granted by the Ministry for Productive Activities (MAP) on the basis of technical recommendations of the Agency for Environmental Protection and Technical Services (APAT). The MAP consults the Ministries of the Environment, Internal Affairs, Labour and Health before issuing the licence.

#### 5.14.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The Ministry for Productive Activities (MAP) is the licensing body for nuclear decommissioning. Licensing procedures for decommissioning are regulated by articles 55, 56 and 57 of the Legislative Decree 230 of 1995. The MAP consults the Ministry of the Environment, the Ministry of Internal Affairs, the Ministry of Labour, the Ministry of Health, interested Regional Governments and, of course, the APAT before issuing a decommissioning licence. The licences may be granted for specific phases of decommissioning work. The documentation for each phase must include a status report of the plant at the beginning and at the end of the phase and licences are issued for each phase.

The APAT is responsible for the regulation and supervision of nuclear installations in matters of nuclear safety and radiation protection. The APAT supervises the decommissioning operations and carries out inspections to verify compliance with the specifications concerning safety and radiation protection. It is a public body with administrative and financial autonomy under the supervision of the Ministry of Environment.

The Ministry of the Environment is the authority responsible for the decisions in matters of environmental compatibility of nuclear projects.

The whole process of licensing of decommissioning projects covering radiological protection and environmental safety is shown in Figure 5.14.1.

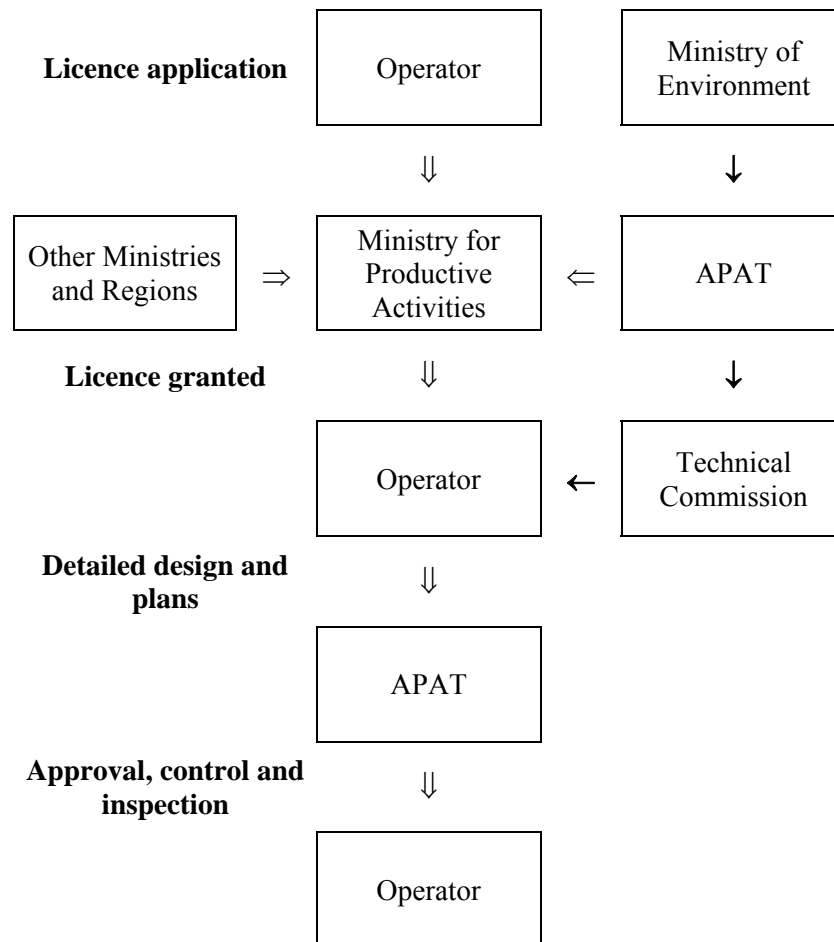
#### 5.14.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The Inter-ministerial Committee for the Economical Planning (CIPE), a Government body in charge of the strategic decisions on nuclear power plants, took the decision that all nuclear power plants in Italy must be shutdown. There were two CIPE resolutions – the first one in December 1987 to shutdown the Latina plant (Magnox) and the second resolution in July 1990 to shutdown both the Trino (PWR) and the Caorso (BWR) plants. The Garigliano BWR plant was already shutdown in 1978. At the same time, CIPE instructed the National Electric Company, ENEL, the owner and licensee of the NPPs, to start the process of decommissioning according to the 'safe closure' strategy. However, there was no common

strategy to undertake the decommissioning activities. There were no disposal sites for low and intermediate level wastes, neither were there interim storage facilities for spent fuel and high level wastes.

Under the Legislative Decree No. 79 of 16 March 1999, all ENEL's liabilities and assets (including manpower and resources) related to the nuclear power plants have been assigned to a newly created company, SO.G.I.N (Società Gestione Impianti Nucleari). SOGIN took over the licences in 2003 and has the responsibility for the decommissioning of nuclear power plants in Italy, for the disposal of low and intermediate level wastes and for the interim storage of high level wastes.

**Figure 5.14.1 Licensing process for decommissioning**



#### 5.14.5 Legal requirement for quality assurance in decommissioning

There is no statutory requirement for quality assurance. However, the decommissioning work is to be supported by a robust quality assurance programme of the company responsible for the work.

#### 5.14.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

This Directive has not yet been fully endorsed in Italy and the Authorities make direct references to this Directive when dealing with plants in decommissioning. However, the previous EC Directive, 85/337/EEC on the *assessment of the effects of certain public and private projects on the environment* had been implemented under the Law No. 349 of 8/7/1986. This Law has resulted in the following secondary legislation: DPCM 377/1988,

DPCM 27/12/1988, DPR 12/4/1996 and DPR 3/9/1999 No. 349, defining the technical procedures for the compilation of the environmental impact studies for certain work categories.

The Ministry of the Environment is the authority responsible for the decisions in matters of environmental compatibility of nuclear projects. For the decommissioning of a nuclear power plant, the implementation of an EIA is required, which includes the preparation of the environmental impact study. The EIA Commission (Commissione VIA) is the Advisory body to the Ministry of Environment and gives technical advice on the environmental compatibility of the project.

#### 5.14.7 National policy defining stages of decommissioning of nuclear installations

Decommissioning is carried out under various phases. The phases are specified by the licence applicant in the submission to the regulatory body of the Global Decommissioning Plan.

### **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

#### 5.14.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

Initially, the licence applicant is required to submit a Global Decommissioning Plan and a detailed document for the first phase. For each phase of decommissioning, the activities to be performed need to be described together with their safety, environmental and radiation protection implications as well as the initial and final state of the site and the waste management provisions. The licences may be granted for individual phases.

#### 5.14.9 Strategy specifying the approach to decommissioning

Decommissioning activities are described in the Global Decommissioning Plan where the outline of the phases of work is also shown.

As the implementation of decommissioning was hampered by the lack of disposal facilities in Italy, The Ministry of Industry in its December 1999 document outlined a strategy incorporating three main goals:

- All solid and liquid radioactive wastes stored on the site of the plants would be treated and conditioned within 10 years
- Site selection and construction of a national repository for low and intermediate level wastes would be done within 10 years
- Prompt decommissioning of nuclear plants, proceeding directly to the dismantling stage in order to release the site without radiological constraints, will be done in about 20 years. For other facilities, the time scale is 15 years.

#### 5.14.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

There is no requirement for a PSR as such. However, the licence condition for a phase requires that the documentation must include a status report at the beginning and at the end of the phase.

#### 5.14.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no decay period as the prompt decommissioning strategy is followed.

#### 5.14.12 Criteria for de-licensing a site

The general criterion for de-licensing a site in Italy is the unrestricted use of the site. Radioactive materials are unconditionally released from regulatory control if the radionuclides comply with both the concentration and half-life threshold:

- $C \leq 1 \text{ Bq.g}^{-1}$ , and
- $T_{1/2} < 75 \text{ days}$ .

#### 5.14.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

As there are no operating nuclear power plants in Italy, there is no provision for discharge authorisations from operating plants. However, for facilities associated with the decommissioning work, the discharge authorisation is issued by SOGIN.

#### 5.14.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

A general clearance criterion for unrestricted release is in force in Italy. It is based on activity concentration and activity half life. The criteria are:

- $C \leq 1 \text{ Bq.g}^{-1}$ , and
- $T_{1/2} < 75 \text{ days}$ .

If both of these conditions are not complied with, a specific authorisation is required for release on the basis of compliance with the following criteria:

- Effective dose  $\leq 10 \mu\text{Sv.y}^{-1}$ , and
- Collective effective dose  $\leq 1 \text{ man.Sv.y}^{-1}$ .

#### 5.14.15 Waste categorisation scheme

In Italy wastes are classified into three categories as per Technical Guide No. 26:

- Category I: wastes which may decay within a few months to a level below safety concerns with  $T_{1/2} < 1 \text{ y}$  (disposal according to general waste regulations)
- Category II: wastes which may decay to a radioactivity level of a few hundred  $\text{Bq.g}^{-1}$  (near surface disposal)
- Category III: Long lived wastes from reprocessing of spent fuel and alpha bearing wastes (deep geological disposal).

#### 5.14.16 Waste disposal facilities within the country

There is no waste disposal facility within the country. Most of the wastes, including spent fuel, are at present stored on site where they are generated. These facilities were not designed for long term storage. In view of this, the Government Special Commissioner has strongly emphasised the urgent construction of a national site for the disposal of low and intermediate level waste and a centralised interim storage facility for spent fuel and high level wastes.

A Working Group was established in April 2003 to identify the criteria for the siting of a final repository for low and intermediate level wastes. The main criteria are:

- Retrievability of wastes
- Long term safety
- Institutional control period no less than 300 years

- Dose limit to the public: 10  $\mu\text{Sv}\cdot\text{y}^{-1}$ .

On the basis of a technical evaluation, SOGIN had selected a site in the south of Italy (Scanzano), but because of strong public opposition, the selection has been abandoned and there is a search for a new site.

### **Part III: Radiological Protection**

#### 5.14.17 Radiological protection principles and standards

The APAT is responsible for the regulation and supervision of nuclear safety and radiation protection. The APAT supervises also decommissioning operations and carries out inspections to verify compliance with specifications concerning safety and radiation protection. The radiological standards are in agreement with the European BSS.

#### 5.14.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The Legislative Decree No. 230 of 1995 on nuclear safety and radiation protection applies to all practices involving ionising radiation covering construction, operation and decommissioning of nuclear plants. The Decree has been amended by the Legislative Decree No. 241 of 2000, which endorsed and incorporated the European Union Directive 96/29/Euratom laying down the basic safety standards for the radiation protection of workers and the public.

### **Part IV: Industrial Safety**

#### 5.14.19 Regulatory body overseeing industrial safety

There is no information available in the public domain regarding the regulatory body overseeing industrial safety in Italy.

#### 5.14.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the regulatory body overseeing industrial safety in Italy.

## **5.15 Latvia**

The information for Latvia was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.15.1 Primary legislation under which a nuclear licence is issued

The Act on Radiation Safety and Nuclear Safety was adopted on 26 October 2000 and entered into force on 21 November 2000. It governs all activities involving radioactive materials and ionising radiation sources. Under this Act, a new independent regulatory authority – Radiation Safety Centre (RDC) (Radiācijas Drošības Centrs – RDC) was set up under the Ministry of Environment. (The Ministry of Environmental Protection and Regional Development was reorganised into the Ministry of Environment in February 2003).

In Latvia, there are no nuclear power plants or nuclear fuel cycle facilities. There was a 5 MWe IRT-type research reactor at Salaspils in the Riga region, which was shut down in June 1998.

5.15.2 National legislative/regulatory body empowered to issue a nuclear site licence

There is no site licence, as such; but nuclear practices are authorised at specific site(s). The RDC is responsible for issuing licences for activities involving ionising radiation sources; organising and coordinating the training of inspectors, managers and persons involved in such activities; accounting of ionising sources and guaranteeing emergency preparedness.

5.15.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The RDC is responsible for the radiological protection of the public and the environment. The RDC is also the competent authority with respect to the transport of nuclear materials and ensuring compliance with safety regulations.

The Radioactive Waste Management Agency (RAPA) (formerly the Radon Enterprise), under the Ministry of Environment, is responsible (from 20 December 2000) for monitoring the shutdown Salaspils nuclear reactor, for the safety assessment of disposal vaults for radioactive waste and for the modernisation of technological procedures. From the beginning of the 1960s, radioactive waste has been collected and transported to the centralised storage/treatment/disposal facility at Baldone. This facility is operated by the RAPA.

Conventional environmental protection aspects are under the State Environment Service; the responsibility for the control of physical protection is shared between the RDC and the Security Police.

Industrial safety is under the responsibility of the Labour Safety Inspectorate.

5.15.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

As Latvia has only one research reactor, all main stages for decisions are taken by the Government, and the Cabinet took the decision to shut it down. The technical and safety issues are assessed and controlled by the RDC, but strategic and financial issues are under decision of the Government.

The site operator is responsible for preparing the necessary plans, for negotiating these with the RDC and the Ministry of Environment before they can be presented to the Cabinet.

5.15.5 Legal requirement for quality assurance in decommissioning

The QA aspects are included in general regulations (national BSS), and capabilities of the operator are regularly assessed during the licensing period (3 years period). There are recommendations from the Cabinet to establish QA systems in state institutions.

5.15.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The Law "On environmental impact assessment" and two further regulations - "Procedures for Strategic Environmental Impact Assessment" and "Procedures for Environmental Impact Assessment" are the national legal requirements for the implementation of an EIA. For the decommissioning of the research reactor, two EIA studies had been made: (i) for the D&D of the research reactor, and (ii) for the expansion of the radioactive waste disposal site to receive wastes from D&D (for building of new vaults). The feedback and recommendations are analysed with relevant organisations and municipalities.



5.15.7 National policy defining stages of decommissioning of nuclear installations

The Cabinet approved the D&D concept and the decommissioning plan, which included stages of decommissioning. For a single facility, the national policy for decommissioning stages was not prepared. For decommissioning planning, the IAEA recommendations are followed.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.15.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

Decommissioning work is carried out under the same operating licence, but certain conditions are to be met such as the use of safe enclosure, preparations for D&D, the use of external companies for conventional works, the use of contractors for D&D etc. The standard length of validity of a licence is 3 years.

5.15.9 Strategy specifying the approach to decommissioning

As Latvia has only one research reactor, all main stages for decisions are taken by the Government. The site operator is responsible for preparing the necessary plans, for negotiating with the RDC and the Ministry of Environment before they can be presented to the Cabinet.

5.15.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

The licence conditions and the regulations require regular progress reports to the RDC. Particularly important is the requirement for acceptance by the RDC of any safety significant activity on the site, if such practice had not been approved during the licensing process.

5.15.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no such period defined. For the low power research reactor, delay in dismantling is not justified - the dose reduction is going to be very small and the price increase would be significant. Thus, for a single facility in this particular situation, a case-by-case approach is preferred.

5.15.12 Criteria for de-licensing a site

Full de-licence could be after reaching the clearance levels.

5.15.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Discharges are regulated in accordance with the radioactive waste management regulations, "Regulations on Practices Involving Radioactive Waste and Related Materials":

- (i) Regular discharges from operating facilities are regulated by the national BSS "Regulations on Protection against Ionising Radiation", but for clearance, the waste management regulations are applied. The numerical values for clearance are from IAEA and EU recommendations.
- (ii) Authorisation for discharges are part of the licensing procedures (issued by the RDC), but for clearance, authorisation is given for a certain amount (for badges) of materials.

- 5.15.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

There are separate national criteria for clearance in the “Regulations on Practices Involving Radioactive Waste and Related Materials”.

- 5.15.15 Waste categorisation scheme

The IAEA waste categorisation scheme is followed as defined in the “Regulations on Practices Involving Radioactive Waste and Related Materials”.

- 5.15.16 Waste disposal facilities within the country

For short-lived LILW and for long-lived low level waste and spent sealed sources, a long-term storage is being built at a waste disposal site. The site is operated by the State Hazardous Waste Management Agency (BAPA). There are generic waste acceptance criteria (“Regulations on Practices Involving Radioactive Waste and Related Materials”), and technical specifications for raw waste.

### **Part III: Radiological Protection**

- 5.15.17 Radiological protection principles and standards

The ICRP 60 recommendations and international BSS provisions are followed.

- 5.15.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

This responsibility is being carried out by the RDC under the “Regulations on Protection against Ionising Radiation”.

### **Part IV: Industrial Safety**

- 5.15.19 Regulatory body overseeing industrial safety

Conventional labour safety issues are controlled by the State Labour Inspectorate.

- 5.15.20 Statutory regulation controlling industrial safety

The Labour Protection Law, Procedures for the Performance of Internal Supervision of the Working Environment, Requirements for Labour Protection in Workplaces are the relevant regulations.

## **5.16 Lithuania**

The information for Lithuania was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

- 5.16.1 Primary legislation under which a nuclear licence is issued

The Law on Nuclear Energy (1996, No.1-1613, last amended 2004) establishes the basic conditions for licensing in the field of nuclear energy. This Act specifies the main documents that need to form an application for a licence and the procedures that should be followed for a licence application to the licensing authority. This Act has been approved by the

Government Resolution No. 103, 'On Approval of Regulations of Licensing of Nuclear Power Related Activities (1998)'.

5.16.2 National legislative/regulatory body empowered to issue a nuclear site licence

The State Nuclear Power Industry Safety Inspectorate (VATESI) is empowered to issue site licences. Licenses for decommissioning as well as for the operation of nuclear facilities are issued by the VATESI after consultation with the Ministry of the Environment or its commissioned organisation and the Radiation Protection Centre (RSC).

The VATESI had approved the Ignalina Nuclear Power Plant Decommissioning General Requirements, VD-EN-01-99, (1999, last amended 2002). The main scope of this document is to specify the basic licensing requirements for decommissioning the Ignalina Nuclear Power Station and to formulate the State Nuclear Safety Inspectorate's requirements relating to the decommissioning process itself, its preparatory stages and its supervision and safety assessment, and the special requirements relating to the decommissioning project documentation.

5.16.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The State Nuclear Industry Safety Inspectorate of the Republic of Lithuania (VATESI) performs the functions of overseeing the safety of nuclear facilities (including the decommissioning phase).

The Ministry of Environment is responsible for establishing environmental pollution standards, monitoring compliance and licensing of emissions (this function is delegated to the Environmental Protection Agency).

The Ministry of Social Security and Labour is responsible for compliance with the requirements of labour, safety at work and related statutory acts.

The Ministry of Health formulates and enforces the standards of health of the workers in the nuclear industry and the public within the monitored zones of the facilities. The Radiation Protection Centre (RSC) under the Ministry of Health is responsible for radiation protection.

5.16.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The Resolution of the Seimas (Parliament) of the Republic of Lithuania on the Approval of the National Energy Strategy (2002), No. IX-1130 stated that it was understood that the European Union Member States recognized that the closure of the Ignalina NPP would constitute an exceptional burden on Lithuania, taking into account the current economic and financial capability of the country. The Resolution also supported and declared the readiness to continue the necessary Community support for the decommissioning of the Ignalina NPP, to shutdown Unit 1 before 2005 and Unit 2 in 2009. The same dates were mentioned in the protocol No. 4 of Accession to the EU. The Unit 1 of INPP has been shutdown on 31 December 2004, implementing the Resolution of the Government No. 1491, (25 November 2004).

5.16.5 Legal requirement for quality assurance in decommissioning

The QA system requirements are specified in the VATESI regulatory document 'Requirements for Quality Assurance Systems at Nuclear Power Plants and other Nuclear Facilities', VATESI VD-KS-02-99. Additionally, the VATESI also requires that the INPP has to follow the IAEA recommendations for the quality management of the decommissioning activities.

As regards the quality assurance in radiation protection, according to the Lithuanian Hygiene Standard HN 87:2002, Radiation Protection in Nuclear Facilities, the licence holder ensures that all procedures assigned for the implementation of the radiation protection programme during operation and decommissioning of a nuclear facility are performed in accordance with the requirements of the quality assurance programme of the nuclear facility.

#### 5.16.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The provisions of the European Council Directive 97/11/EC have been transposed to the Law on Environmental Impact Assessment of the Proposed Economic Activity (2000, last amended in 2005).

In Lithuania, an environmental impact assessment is performed in accordance with the following legal acts:

- The Law on Environmental Impact Assessment of the Proposed Economic Activity (2000, last amended in 2005)
- The Governmental Resolution of 2000-07-28, No. 900 on Empowering the Ministry of Environment and Subordinate Institutions
- The Order of the Minister of the Environment of the Republic of Lithuania of 2000-06-30, No. 263 on the Approval of the Methodological Guidelines on the Screening of the Proposed Economic Activity
- The Order of the Minister of the Environment of 2000-06-30, No. 262 on the Approval of the Regulations on Preparation of the Environmental Impact Assessment Programme and Report
- The Order of the Minister of the Environment of 2000-07-10, No. 277 on the Approval of the Order of Informing the Public and Public Participation in the Process of Environmental Impact Assessment
- The Order of the Minister of the Environment of the Republic of Lithuania of 2000-07-17, No. 305 on the Approval of the Guidelines on the Quality Control of the Environmental Impact Assessment of the Proposed Economic Activity
- The Order of the Minister of the Environment of 2000-08-07, No. 333 on the Approval of the Order of Investigating the Environmental Impact Assessment Documents at the Ministry of Environment and Subordinate Institutions.

#### 5.16.7 National policy defining stages of decommissioning of nuclear installations

A decommissioning phase – as a part of the decommissioning project – is selected at the discretion of the operator, which may not coincide with the IAEA defined decommissioning stage. For example, the Ignalina NPP decommissioning follows the determination of the physical status of the plant and then initial, intermediate and final phases of decommissioning.

### **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

Licenses for decommissioning as well as for the operation of nuclear facilities are issued by the VATESI after consultation with the Ministry of the Environment or its commissioned organisation and the Radiation Protection Centre (RSC).

The VATESI has approved the Ignalina Nuclear Power Plant Decommissioning General Requirements, VD-EN-01-99, (1999, last amended 2002). The main scope of this document is to specify the basic licensing requirements for the decommissioning of the Ignalina

Nuclear Power Station and to formulate the State Nuclear Safety Inspectorate's requirements relating to the decommissioning process itself, its preparatory stages and its supervision and safety assessment, and the special requirements relating to the decommissioning project documentation.

5.16.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

A decommissioning licence is required. The VATESI is authorised to issue such a licence.

A licence has two annexes:

1. the licence conditions, and
2. a list of documents, which formed the basis to issue the licence.

After the final shutdown of the reactor (Unit 1 of the INPP) and following de-fuelling, the operational licence is modified and a decommissioning licence is issued.

5.16.9 Strategy specifying the approach to decommissioning

The Resolution of the Government No. 1848 (26 Nov. 2002) established that the State Enterprise Ignalina NPP should plan and implement the decommissioning of Unit 1 in accordance with the immediate dismantling strategy. To help making decisions on the strategy, a supporting document was produced to provide the Government with the technical and financial considerations required to select the dismantling strategy. Based on the immediate dismantling strategy, Ignalina NPP has prepared the Final Decommissioning Plan for Ignalina NPP Units 1 and 2, which was coordinated by the regulatory authorities and approved by the Ministry of Economy.

5.16.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

The Ignalina Nuclear Power Plant Decommissioning General Requirements, VD-EN-01-99, require that decommissioning will be preceded by an exhaustive, systematic safety assessment. The assessment must be firmly supported by documentation, which should be continually updated in the light of the decommissioning experience and new significant safety information. The time period for this safety assessment update has not been specified.

5.16.11 Decay periods for radioactive materials within a particular stage of decommissioning

There are no decay periods for radioactive materials considered within a particular stage of decommissioning.

5.16.12 Criteria for de-licensing a site

In order to get the site de-licensed by the VATESI, the INPP must submit a Final Decommissioning Report. The radiological criteria for site release shall not be exceeded, i.e., individual dose  $< 10 \mu\text{Sv}$  and collective dose for the critical group of the population  $< 1 \text{ man.Sv}$ . Also the operator, carrying out the decommissioning, shall ensure that the annual dose constraint for the critical group of the population is not exceeded (0.2 mSv).

5.16.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The Lithuanian document LAND 42-2001 "Limitation of Radioactive Discharges from Nuclear Facilities, on the Permitting of Discharges and on the Radiological Monitoring" (2000), was adopted by the Minister of Environment.

The Requirements of the document LAND 42–2001 are applied in order to protect human beings, other living organisms, natural resources (the land, forest, water) and other environmental entities from harmful effects of ionising radiation and contamination by radio-nuclides from nuclear installations. The requirements of this document are obligatory for nuclear facilities when designing, constructing and operating them as well as during decommissioning.

The Ministry of Environment is authorised to issue discharge authorisations.

#### 5.16.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The basic radiation protection standards (including exemption criteria), safety requirements in practices and management of radioactive wastes are set in the Lithuanian Hygiene Standard HN 73:2001, "Basic Standards of Radiation Protection" (first issue – in 1997, last amendment – in 2002), which is in compliance with the requirements of Safety Series No. 115, International Basic Safety Standards for Protection against Ionizing Radiation, and the Council Directive 96/29/EURATOM of 13 May 1996, Basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation.

Clearance criteria are defined in the normative document LAND 34-2000, 'Clearance Levels of Radio-nuclides, Conditions of Reuse of Materials and Disposal of Waste' (2000). The requirements of this document do not apply to:

1. Construction materials and products, where maximum permissible concentrations of natural radio-nuclides and  $^{137}\text{Cs}$  are determined by the Lithuanian Hygiene Norm HN 85:2003, "Natural Exposure. Radiation Protection Standards"
2. Foodstuff and raw materials for foodstuff, where maximum permissible concentrations of contaminants and radio-nuclides are determined by the Order of the Minister of Health No. V-489 (2004), "On Approval of Maximum Permissible Levels of Activities of Caesium Isotopes, Applicable to Agricultural Products following the Chernobyl Nuclear Power Plant Accident"
3. Packages and vehicles contaminated during transportation of radioactive substances, the decontamination of which is determined by the European Treaty on Road Transportation of Dangerous Materials (ADR) and the protocol of its signing and the IAEA Regulations for the Safe Transportation of Radioactive Material.

#### 5.16.15 Waste categorisation scheme

According to the radiological characteristics, wastes are classified into three classes of short lived LILW and two classes of long lived LILW. HLW includes radioactive liquids containing most of the fission products and actinides present in spent nuclear fuel – which forms the residue from the first solvent extraction cycle in reprocessing. At present, at the Ignalina NPP, the classification of radioactive wastes complies with the old regulations of the USSR (SP AS-88). The new classification compliant with VD-RA-01-2001 (VATESI) shall be adopted after the modernization of the radioactive waste management system at the Ignalina NPP and after the New Waste Management Facility became operational. In fact, all waste will be classified (and existing waste reclassified) according to the new classification. See Table 5.16.1.

**Table 5.16.1 Solid waste classification**

Waste classes	Definition	Abbreviation	Surface dose rate mSv/h	Conditioning	Disposal method
<i>Short lived low and intermediate level waste*</i>					
A	Very low level waste	VLLW	≤ 0.5	Not required	Very low level waste repository
B	Low level waste	LLW-SL	0.5 - 2	Required	Near surface repository
C	Intermediate level waste	ILW-SL	> 2	Required	Near surface repository
<i>Long lived low and intermediate level waste**</i>					
D	Low level waste	LLW-LL	≤ 10	Required	Near surface repository (cavities at intermediate depth)
E	Intermediate level waste	LW-LL	> 10	Required	Deep geological repository
<i>Spent sealed sources</i>					
F	Disused sealed sources	DSRS		Required	Near surface or deep geological repository***

\* Containing beta/gamma emitting radio-nuclides with half-lives less than 30 years, including Cs<sup>137</sup>, and long lived alpha emitting radio-nuclides with measured or calculated activity concentrations less than 4'000 Bq/g in individual waste packages but with an overall average activity concentration of long lived alpha emitting radio-nuclides less than 400 Bq/g per waste package.

\*\* Containing beta/gamma emitting radio-nuclides with half-lives more than 30 years, not including Cs<sup>137</sup>, and long lived alpha emitting radio-nuclides with measured or calculated activity concentration more than 4'000 Bq/g in individual waste packages but with an overall average activity concentration of long lived alpha emitting radio-nuclides in excess of 400 Bq/g per waste package.

\*\*\* Depending on the waste acceptance criteria for disused sealed sources.

#### 5.16.16 Waste disposal facilities within the country

Only one industrial waste disposal facility (for Radon sources), called Maisiagala radioactive waste disposal facility (closed in 1989), existed in Lithuania. Initially, it was designed as a disposal facility only for institutional radioactive waste.

### **Part III: Radiological Protection**

#### 5.16.17 Radiological protection principles and standards

The Radiation Protection Centre (RSC) of the Ministry of Health is responsible for radiation protection of the workers and the public. The RSC derives its authority under Article 7 of the Law on Radiation Protection No. VIII-1019 (adopted on 12 January 1999, last amended 2004) which states that this regulatory body is responsible for coordinating the activities of the executive and other bodies of the public administration and local government in the field of radiation protection, monitoring and expert examination of public exposure (<http://www.rsc.lt>).

#### 5.16.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

There are no differences or discrepancies between the national radiological protection standards and the European BSS. The Lithuanian Hygiene Standard is HN 73:2001, "Basic Standards of Radiation Protection". See also Section 5.16.15.

## **Part IV: Industrial Safety**

### 5.16.19 Regulatory body overseeing industrial safety

The Ministry of Social Security and Labour is responsible for compliance with the requirements of labour, safety at work and related statutory acts.

### 5.16.20 Statutory regulation controlling industrial safety

The Law on Safety and Health at Work, Official Gazette (Žin., 2003, Nr. 70-3170) provides legal provisions and requirements to protect workers from occupational hazards.

The Law on The State Labour Inspectorate of the Republic of Lithuania, Official Gazette (Žin., 2003, Nr. 102-4585) stipulates that the main objectives of the Labour Inspectorate shall be as to carry out the public job safety policy ensuring the prevention of job safety violations, occupational accidents and diseases; and to control the implementation of laws on labour and job safety, and other standard acts regulating these issues.

The Law on Chemical Substances and Preparations, Official Gazette (Žin., 2000, Nr. 36-987) lays down provisions relating to the classification, packaging, labelling, notification of new chemical substances.

The Regulation on Risk Assessment at Work, Official Gazette (Žin., 2003, Nr. 100-4504) has the aim to control risks at work. The employer at each workplace has a general duty to ensure the safety and health of workers in every aspect related to work. The purpose of carrying out a risk assessment is to enable the employer to effectively take the measures necessary for safety and health protection of the workers.

## **5.17 Luxembourg**

The information for Luxembourg was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.17.1 Primary legislation under which a nuclear licence is issued

In Luxembourg, the regulation of radiological protection and nuclear energy is based on the Law of 25 March 1963 concerning the protection of the population against the danger arising from ionising radiation (Loi modifiée du 25 mars 1963 concernant la protection de la population contre les dangers résultant des radiations ionisantes). The last amendment to the regulation was put into force on 14 December 2000 (Règlement grand-ducal du 14 décembre 2000 concernant la protection de la population contre les dangers résultant des rayonnements ionisants).

#### 5.17.2 National legislative/regulatory body empowered to issue a nuclear site licence

As Luxembourg has never operated any nuclear facility/installation or is planning to do so in the future, the question of site licensing does not arise. Consequently, there is no nuclear site licensing provision. For the protection of the public from the hazards of ionising radiation, the Division of Radiation Protection (Division de la Radioprotection) is the national legislative body.

However, there are requirements for licences of radioactive waste storage facilities. Dependent on the amount of stored activity, the facilities are placed in four different categories requiring different licensing procedures:



- **Category I** defines facilities of the nuclear fuel cycle, their decommissioning, radioactive waste management facilities and facilities for the final disposal of radioactive waste. Currently no undertaking of Category I exists in Luxembourg.
- **Category II** is dedicated to facilities using or holding radioactive substances exceeding by a factor of thousand the exemption limits as fixed by the Council Directive 96/29/EURATOM of 13 May 1996, or conditioning, respectively having an interim storage of radioactive waste.
- **Category III** includes facilities using or holding radioactive substances above the exemption limits fixed by the Council Directive 96/29/EURATOM of 13 May 1996, but not exceeding these levels by a thousand fold.
- **Category IV** includes facilities using or holding radioactive substances staying below the exemption limits fixed by the Council Directive 96/29/EURATOM of 13 May 1996 but exceeding 1/100 of these limits.

The regulation lays down separate licensing conditions for each category of installation, notably in relation to the technical information to be supplied, public information and participation in the licensing procedure. A prior license from the competent authorities is required for Categories I-III. Declaration is sufficient for Category IV.

The Council of the Government for Category I, the Minister of Health for Category II and the Health Directorate for Categories III and IV are the competent bodies in authorizing facilities of the respective categories. The Minister of Health may suspend or withdraw a licence when the licensee contravenes the regulation in force or the conditions of the license.

#### 5.17.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The question of decommissioning does not apply to Luxembourg. For radiological protection and industrial safety, the technical authority is the Division of Radiation Protection which performs its tasks with the help of international experts and other ministries.

The legislative and executive competence in the field of radiological safety and radiation protection lie with the Division of Radiation Protection of the Ministry of Health. The Minister of Health is responsible for enforcing radiation protection legislation.

#### 5.17.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The question of decommissioning does not apply to Luxembourg. See Section 5.17.3.

#### 5.17.5 Legal requirement for quality assurance in decommissioning

The question of decommissioning does not apply to Luxembourg. As Luxembourg has no operating nuclear facility or waste management facility, no specific quality assurance programme exists. However, in the field of operational radiation protection and survey of radioactive sources, a QA programme does exist.

#### 5.17.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

This issue is not applicable in Luxembourg.

#### 5.17.7 National policy defining stages of decommissioning of nuclear installations

The question of decommissioning does not apply to Luxembourg. See Section 5.17.3.

## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.17.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning
- A separate licence, as distinct from an operational licence, will be necessary to carry out decommissioning if required.
- The whole Government is authorised to issue such a licence.
- Special licensing conditions will be prescribed concerning safety.
- 5.17.9 Strategy specifying the approach to decommissioning
- As Luxembourg has no nuclear installations, the question of a decommissioning strategy does not arise.
- 5.17.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses
- If any need for decommissioning arises in the future (at the moment there is no nuclear installation in Luxembourg), rules and standards of one of the neighbouring countries, for instance of Germany, will be adopted.
- 5.17.11 Decay periods for radioactive materials within a particular stage of decommissioning
- The question of decommissioning does not apply to Luxembourg.
- 5.17.12 Criteria for de-licensing a site
- The criteria do not apply in Luxembourg.
- 5.17.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases
- The Regulation of 14 December 2000 concerning the protection of the population against the dangers arising from ionising radiation is the relevant legislation. The Government is the authority. This regulation applies to the production, manufacture, possession, sale, transit, transport, import, export, use for commercial, industrial, medical, scientific or other purposes, recycling and re-use of equipment or substances capable of emitting ionizing radiation. This also applies to the treatment, handling, storage, elimination and disposal of radioactive substances or waste and to any other activity involving a risk arising from ionizing radiation.
- 5.17.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)
- The Regulation of 14 December 2000 is in agreement with the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996).
- 5.17.15 Waste categorisation scheme
- The IAEA waste categorisation scheme is followed.
- 5.17.16 Waste disposal facilities within the country
- In Luxembourg, radioactive waste only arises from the use of radioactive sources in industry, medicine and, to some extent, from the use in education and research. Its activity and its

volume being very low, the Luxembourg Government takes the position that the option of a national management facility and of a final disposal facility would be unrealistic. Therefore all disused sealed sources have to be returned to the country of origin and if this turns out to be impossible, deal will be made with a foreign waste management facility.

### **Part III: Radiological Protection**

#### 5.17.17 Radiological protection principles and standards

The radiological standards are in agreement with the European BSS.

#### 5.17.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

In Luxembourg, the regulation of radiological protection and nuclear energy is based on the Law of 25 March 1963 on the Protection of the Public Against the Hazards of Ionising Radiation, which established general principles. These principles formed the basis for executive regulations, which were regularly amended in conformity with the EU directives on radiation protection. The last amendment of the regulation was put into force on 14 December 2000. This regulation was adopted to implement the Council Directive 96/29/Euratom of 13 May 1996.

### **Part IV: Industrial Safety**

#### 5.17.19 Regulatory body overseeing industrial safety

The Division of Radiation Protection is the regulatory body. If required, the country would hire international experts and the German TUV to perform the task.

#### 5.17.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety in Luxembourg.

### **5.18 Malta**

The information for Malta was prepared mainly from documents available in the public domain.

Malta has no nuclear power plants, no research reactors nor any other nuclear facility. As a result, no decommissioning activities have to be considered.

### **5.19 The Netherlands**

The information for The Netherlands was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.19.1 Primary legislation under which a nuclear licence is issued

The basic legislation governing nuclear activities in the Netherlands is contained in the Nuclear Energy Act (Bulletin of Acts, Orders and Decrees, 82, 1963, as amended 2004).

The other main laws in the Netherlands to which nuclear installations are subject:

- the Environmental Protection Act (1979, as amended 2002)
- the General Administrative Law Act (1992, as amended 2003).

#### 5.19.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Dutch national regulatory body for the safety of Dutch nuclear installations is the Nuclear Safety Service (KFD) of the Ministry of Housing, Spatial Planning and the Environment (VI: VROM Inspectorate). The Directorate for Chemicals, Waste, Radiation Protection (SAS – “Stoffen, Afvalstoffen en Straling”) of the Ministry of Housing, Spatial Planning and Environment is responsible for the licensing of nuclear installations and nuclear transports in general (all procedural aspects), as well as for all aspects of radiation protection and external safety.

#### 5.19.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The regulatory body for decommissioning as well as for radiation protection is the Directorate for Chemicals, Waste, Radiation Protection (SAS – “Stoffen, Afvalstoffen en Straling”) of the Ministry of Housing, Spatial Planning and Environment. The responsibility of the Directorate is the development of the policy and its implementation in the field of radiation protection and nuclear safety.

#### 5.19.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The general policy of the Government is that D&D operations should be carried out as soon as possible. However, it is up to the operator of the NPP to identify the preferred option as identified in the decommissioning plan.

#### 5.19.5 Legal requirement for quality assurance in decommissioning

The Dutch Nuclear Energy Act (Article 21.1) provides the basis for a system of more detailed safety regulations concerning the design, operation and quality assurance of nuclear power plants. These regulations are collectively referred to as the Nuclear Safety Rules and developed under the responsibility of the Minister of Housing, Spatial Planning and the Environment, and the Minister of Social Affairs and Employment.

#### 5.19.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The Environmental Protection Act (1979, as amended, 2002) implements the EC Directive 07/11/EC of 3 March 1997.

#### 5.19.7 National policy defining stages of decommissioning of nuclear installations

The stages of decommissioning are identified by the operator of the facility on the basis of a study about the possible options.

## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.19.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

The Nuclear Energy Act states that licenses are required for building, commissioning, operating, modifying or decommissioning nuclear installations (Section 15b), as well as for nuclear driven ships (Section 15c). To date, the latter category has not been of any practical significance.

The authorising body is the Directorate for Chemicals, Waste, Radiation Protection (SAS – “Stoffen, Afvalstoffen en Straling”) of the Ministry of Housing, Spatial Planning and Environment.

- 5.19.9 Strategy specifying the approach to decommissioning

There is no defined strategy. The operator follows the most cost effective and acceptable option from those specified in the Decommissioning Plan.

- 5.19.10 Requirement for a Periodic Safety Report as decommissioning progresses

There is no requirement for a Periodic Safety Report as decommissioning progresses.

- 5.19.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no specified decay period between the stages of decommissioning. The implementation of decommissioning operations is carried out on a case-by-case basis.

- 5.19.12 Criteria for de-licensing a site

Criteria for de-licensing have not been mentioned explicitly in the Dutch National Report.

- 5.19.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Solid radioactive waste is managed by the COVRA. In the operating license of the COVRA, both atmospheric and liquid discharges of radio-nuclides are restricted by requirements. For the derivation of the authorized discharge limits, the annual dose limits for the population are the determining factor. Discharges in air are regulated by the Minister of Agriculture, Nature Management and Fisheries (LNV), whereas discharges in water are regulated by the Minister of Transport, Public Works and Water Management (V&W).

As prescribed in the operating licence of spent fuel management facilities, all discharges of radioactive effluents must be monitored, quantified and documented. The licensee must report the relevant data on discharges and radiological exposure to the regulatory body. On behalf of the regulatory body, the National Institute for Public Health and the Environment (RIVM) regularly checks the measurements of the quantities and the composition of discharges. The licensee is also required to set up and maintain an adequate off-site monitoring programme. This programme normally includes measurements of radiological exposures and possible contamination of grass and milk in the vicinity of the installation. The results are reported to - and regularly checked by - the regulatory body. Under Article 36 of the Euratom treaty, the discharge data must be submitted to the European Commission each year.

5.19.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The use of radioactive material exceeding exemption limits is subject to a licence under the Radiation Protection Decree.

5.19.15 Waste categorisation scheme

In the Netherlands there are three waste categories: LILW, HLW (non heat producing) and HLW (heat producing). No distinction is made between short lived and long lived LILW as defined by the IAEA waste categorisation scheme. The reason for this is that shallow land burial is not applicable for the Netherlands. All categories of waste will be disposed of in a deep geologic repository in the future.

5.19.16 Waste disposal facilities within the country

At present, there are no plans for the construction of a disposal facility in the Netherlands.

Except for radioactive wastes with a half-life time less than 100 days, which is allowed to decay at the sites where it is being generated, all radioactive wastes produced in the Netherlands are managed by the COVRA, the Central Organisation for Radioactive Waste. The COVRA operates a facility at the industrial area Vlissingen-Oost in the south-west of the country. The table below gives an overview of the surface storage facilities in the Netherlands.

Location	Spent fuel storage facility	Features
<i>Borssele</i>	Dry storage in vaults	COVRA facility for treatment and storage of HLW and SF (HABOG)
	Fuel storage pond	Pond associated with the nuclear power station where spent fuel is stored temporarily before shipment to La Hague for reprocessing
<i>Petten</i>	Fuel storage pond	Belongs to the HFR research reactor; fuel is stored temporarily awaiting shipment to USA or to the COVRA
	Dry storage in drums	NRG Waste Storage Facility; spent fuel samples from HFR irradiation experiments; stored in concrete-lined vaults
<i>Delft</i>	Fuel storage pond	Belongs to HOR research reactor

Location	Radioactive waste storage facility	Features
<i>Borssele</i>	Dry storage in vaults	COVRA facility for treatment and storage of HLW and SF (HABOG)
	Dry storage of LILW in conditioned form in drums	COVRA facility for treatment and storage of LILW
	Dry storage of NORM and TENORM-waste in containers	COVRA container storage facility
	Dry storage of small containers of depleted uranium oxide	COVRA facility for storage of U <sub>3</sub> O <sub>8</sub> ; this waste may be retrieved and converted when uranium prices increase
<i>Petten</i>	Dry storage of unconditioned waste in drums	NRG Waste Storage Facility; partly HLW from irradiation experiments; to be transferred to the COVRA

### **Part III: Radiological Protection**

#### 5.19.17 Radiological protection principles and standards

The EC Directive 96/29/Euratom of 13 May 1966 (BSS) is incorporated in the relevant Dutch regulations of the Nuclear Energy Act.

#### 5.19.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The EC Directive 96/29/Euratom of 13 May 1966 (BSS) is incorporated in the relevant Dutch regulations of the Nuclear Energy Act.

Since 1 March 2004 the national body for supervision of the Dutch nuclear installations is the Nuclear Safety Service (KFD) of the Inspectorate of the Ministry of Housing, Spatial Planning and the Environment (VI: VROM Inspectorate). At the same ministry, the Chemicals, Waste and Radiation Protection Directorate (SAS) is responsible for assessing whether the radiological safety objectives have been met and then issuing a licence.

### **Part IV: Industrial Safety**

#### 5.19.19 Regulatory body overseeing industrial safety

Industrial Safety is under the umbrella of the Ministry of Housing, Spatial Planning and the Environment (VI: VROM Inspectorate).

#### 5.19.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety.

## **5.20 Poland**

The information for Poland was prepared mainly from documents available in the public domain.

### **Part I: Institutional and Legal Aspects**

#### 5.20.1 Primary legislation under which a nuclear licence is issued

The Atomic Energy Act of 10 April 1986 is the primary legislation in Poland. It was revised by the Atomic Energy Act of 29 November 2000 (hereinafter referred to as 'the Act') which entered into force on 1 January 2002 and is now the framework act governing all nuclear activities in Poland. It establishes the licensing system which applies to:

- Nuclear installations (from site selection to decommissioning)
- Manufacture, use and trade in nuclear materials
- Manufacture and use of ionising radiation sources
- Radioactive waste and spent nuclear fuel
- Transport of nuclear materials, radioactive waste
- Nuclear third party liability
- Construction and operation of waste repositories.

At present, there are no nuclear power plants in Poland and hence licensing/de-licensing requirements for nuclear power plants do not arise. There are, however, two research reactors in Poland including the EWA reactor which is undergoing decommissioning from February 1995.

5.20.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Atomic Energy Act of 29 November 2000 provides that a licence from the competent nuclear safety and radiation protection authority is required to carry out activities related to the application of atomic energy. Amongst the activities listed are the production, conversion, storage or use of nuclear materials.

The National Atomic Energy Agency (NAEA) which was set under the Act is the main executive and supervisory body. It is a government body under the authority of the Minister of the Environment. The NAEA is headed by its president who is appointed by the Prime Minister on the recommendation of the Minister of the Environment. The president is empowered to issue licences, with the exception of licences to manufacture, purchase, install and use of X-ray machines emitting energy less than or equal to 300 keV, which are granted by the local sanitary inspector.

5.20.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The NAEA is the only regulatory body covering all the areas in the nuclear field.

5.20.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

There is no information available in the public domain regarding the national regulatory policy and/or Government policy for decommissioning of nuclear facilities in Poland.

5.20.5 Legal requirement for quality assurance in decommissioning

There are no explicit requirements for maintaining quality assurance standards.

5.20.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

There is no reference to the compliance with the EIADR.

5.20.7 National policy defining stages of decommissioning of nuclear installations

There is no information available in the public domain regarding the national policy defining stages of decommissioning of nuclear installations in Poland.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.20.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

The nuclear safety, radiological protection and physical protection of a nuclear facility all apply together during various stages of the lifetime of a nuclear installation. The president of the NAEA is responsible for the safe conduct of these activities.



5.20.9 Strategy specifying the approach to decommissioning

There is no information available in the public domain regarding the strategy specifying the approach to decommissioning in Poland.

5.20.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

There is no information available in the public domain regarding the requirement for a Periodic Safety Report (PSR) as decommissioning progresses in Poland.

5.20.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no information available in the public domain regarding decay periods for radioactive materials within a particular stage of decommissioning in Poland.

5.20.12 Criteria for de-licensing a site

There is no information available in the public domain regarding the criteria for de-licensing a site in Poland.

5.20.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

There is no specific discharge authorisation regime. However, discharges are controlled on the basis of assessed dose uptake by the public.

5.20.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

There is no explicit directive requiring nuclear activities to comply with the European BSS of 96/29/Euratom of 13 May 1996. But there is a reference to comply with the IAEA standards entitled 'International Basic Safety Standards for Protection against Ionising Radiation and for the Safety of Radiation Sources' (FAO, IAEA, ILO, OECD/NEA, PAHO and WHO), IAEA Safety Series No. 115, Vienna, 1996.

5.20.15 Waste categorisation scheme

The IAEA waste categorisation scheme is not followed.

5.20.16 Waste disposal facilities within the country

There is no information available in the public domain regarding the waste disposal facilities within the country.

**Part III: Radiological Protection**

5.20.17 Radiological protection principles and standards

The radiological safety standards are the same as the International BSS.

5.20.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

There is no mention of compliance with the European BSS, although the International BSS are being followed.

## **Part IV: Industrial Safety**

### 5.20.19 Regulatory body overseeing industrial safety

There is no information available in the public domain regarding a regulatory body overseeing industrial safety.

### 5.20.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety.

## **5.21 Portugal**

The information for Portugal was prepared mainly from documents available in the public domain.

### **Part I: Institutional and Legal Aspects**

#### 5.21.1 Primary legislation under which a nuclear licence is issued

At the moment, there are no nuclear power plants in Portugal. But there are fuel cycle facilities for which there are licensing provisions in place. The Decree-Law No. 487 of 5 December 1972 (Section 1) states that a nuclear power plant or a nuclear facility must comply with the licensing procedures.

#### 5.21.2 National legislative/regulatory body empowered to issue a nuclear site licence

The General Directorate for Geology and Energy (DGGE) under the Ministry for Economic Affairs, and the Environment Institute (IA) under the Ministry for Urban Affairs, Territorial Planning and Environment, are the competent authorities for licensing activities related to the nuclear fuel cycle. The General Directorate of Health is responsible for issuing licences for installations and equipment producing ionising radiation. The licensing procedure takes place in three stages by granting preliminary licences: (i) site approval, (ii) construction, and (iii) operation.

#### 5.21.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The Department of Radiological Protection and Nuclear Safety (DPRSN) is responsible for the radiological protection, including the management of radioactive waste. DPRSN carries out the licensing of all activities involving sealed sources for the industrial, the research and the medical sector, in collaboration with the Ministry of Health and the Ministry of Environment.

The Environment Institute (IA) under the Ministry for Urban Affairs, Territorial Planning and Environment is responsible for the protection of the environment (D.L. No. 38/90 of 27 November 1990). It is the competent authority in charge of environmental impact studies that are required prior to any licence being granted to nuclear facilities.

#### 5.21.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

There are no facilities in decommissioning in the country. However, the Minister for Economic Affairs is responsible for the nuclear policy in Portugal. He makes proposals in

respect of the industrial and technological policy and is responsible for its implementation within the general policy determined by the Government.

5.21.5 Legal requirement for quality assurance in decommissioning

There is no information available in the public domain regarding the legal requirement for quality assurance in decommissioning.

5.21.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

There is a national statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning.

5.21.7 National policy defining stages of decommissioning of nuclear installations

A national policy defining stages of decommissioning of nuclear installations is not an issue in Portugal.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.21.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

The requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning is not an issue in Portugal.

5.21.9 Strategy specifying the approach to decommissioning

A strategy specifying the approach to decommissioning is not an issue in Portugal.

5.21.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

The requirement for a Periodic Safety Report (PSR) as decommissioning progresses is not an issue in Portugal.

5.21.11 Decay periods for radioactive materials within a particular stage of decommissioning

Decay periods for radioactive materials within a particular stage of decommissioning are not an issue in Portugal.

5.21.12 Criteria for de-licensing a site

Criteria for de-licensing a site are not an issue in Portugal.

5.21.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

There is no information available in the public domain regarding the discharges of radioactive materials in solid, liquid and gaseous phases in Portugal.

5.21.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The Ministry of Health under the D.L. 165/02 of 17 July, 2002 implements part of the Council Directive 96/29/Euratom.

#### 5.21.15 Waste categorisation scheme

The European waste classification scheme is followed.

#### 5.21.16 Waste disposal facilities within the country

Sealed and unsealed sources are collected, segregated and stored at the Radioactive Waste Interim Storage Facility at the Nuclear and Technological Institute (ITN) located in Sacavém.

### **Part III: Radiological Protection**

#### 5.21.17 Radiological protection principles and standards

The Regional Health Authorities conduct inspection and control of radiological installations. It incorporates the principles of justification, optimisation (ALARA) and dose limitation.

#### 5.21.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The Ministry of Health under the D.L. 165/02 of 17 July, 2002 implements part of the Council Directive 96/29/Euratom for the protection of workers and the general public.

### **Part IV: Industrial Safety**

#### 5.21.19 Regulatory body overseeing industrial safety

No information about a regulatory body overseeing industrial safety has been obtained.

#### 5.21.20 Statutory regulation controlling industrial safety

No information about the statutory regulation controlling industrial safety has been obtained.

## **5.22 Romania**

The information for Romania was prepared mainly from documents available in the public domain.

### **Part I: Institutional and Legal Aspects**

#### 5.22.1 Primary legislation under which a nuclear licence is issued

Romania had laws governing the regulation of nuclear activities since 1974. They remained in force until 1996, when a new legislation was issued – Law 111/1996. Several amendments have been made to this Law – the latest being the Law No. 193 of 13 May 2003, published in the Official Gazette (Monitural Oficial, Part 1, No. 343) on 20 May 2003. The purposes of these amendments were to bring the Romanian nuclear activities to comply with the European Union's safety standards and international conventions.

Romania has one nuclear power plant at Cernavoda, made up of two CANDU-type reactor units, each of 706 MWe capacity. There are two research reactors: one in operation, the 14 MWe TRIGA-type Material Testing Reactor at the Pitesti Branch of Nuclear Research, and the other which is shutdown, a 2 MWe VVR-S type research reactor at the Bucharest-Magurele National Institute for Physics and Nuclear Engineering (IFIN).

5.22.2 National legislative/regulatory body empowered to issue a nuclear site licence

The National Commission for Nuclear Activities Control (CNCAN) is the national regulatory body who, under the authority of the Law 111/1996 and its amendments, is authorised to issue licences to nuclear installations. Since December 2000, the CNCAN has become an independent governmental body reporting only administratively to the Ministry of Waters and Environmental Protection. In fact, the president of the CNCAN is a Secretary of State and hence the Minister can not interfere in the CNCAN president's decision.

5.22.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The CNCAN is responsible for all issues of nuclear safety relating to siting, construction, operation and decommissioning of nuclear installations in Romania. It is also responsible for quality assurance, radiation safety, radiation protection, radioactive waste management, emergency preparedness, import and export of nuclear materials.

The Ministry of Agriculture, Forests, Water and Environment is responsible for developing the environmental protection legislation and the environmental protection licensing process.

The National Agency for Radioactive Waste (ANDRAD) was established by Governmental Ordinance No. 11/2003 on the Safe Management of Spent Nuclear Fuel and Radioactive Waste, including final disposal.

The Ministry of Health is responsible for the use of radioactive materials for medical and industrial purposes.

5.22.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

There is no information available in the public domain regarding the national regulatory policy and/or Government policy for decommissioning of nuclear facilities in Romania.

5.22.5 Legal requirement for quality assurance in decommissioning

There is a legal requirement for quality assurance in decommissioning in Romania. The CNCAN is responsible for its implementation.

5.22.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning has been implemented in the Romanian regulation (see Section 5.22.1).

5.22.7 National policy defining stages of decommissioning of nuclear installations

There is no information available in the public domain regarding a national policy defining stages of decommissioning of nuclear installations in Romania.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.22.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

There is no information available in the public domain regarding a requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning in Romania.

5.22.9 Strategy specifying the approach to decommissioning

There is no information available in the public domain regarding the strategy specifying the approach to decommissioning in Romania.

5.22.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

There is no information available in the public domain regarding the requirement for a Periodic Safety Report (PSR) as decommissioning progresses in Romania.

5.22.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no information available in the public domain regarding decay periods for radioactive materials within a particular stage of decommissioning in Romania.

5.22.12 Strategy specifying the approach to decommissioning

There is no information available in the public domain regarding the criteria for de-licensing a site in Romania.

5.22.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

There is no information available in the public domain regarding discharges of radioactive materials in solid, liquid and gaseous phases in Romania.

5.22.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

Romania follows the exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996). The CNCAN is responsible under the Law No. 193/2003.

5.22.15 Waste categorisation scheme

There is no information available in the public domain regarding the waste categorisation scheme in Romania.

5.22.16 Waste disposal facilities within the country

There is no information available in the public domain regarding the waste disposal facilities within the country.

**Part III: Radiological Protection**

5.22.17 Radiological protection principles and standards

Radiological protection standards are in agreement with the European BSS.

5.22.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The transposition of this Directive was completed through the adoption by the Minister of Health and Family under Order No. 944 of 28 December 2001.

## **Part IV: Industrial Safety**

### 5.22.19 Regulatory body overseeing industrial safety

There is no information available in the public domain regarding a regulatory body overseeing industrial safety in Romania.

### 5.22.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety in Romania.

## **5.23 Slovak Republic**

The information for Slovak Republic was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.23.1 Primary legislation under which a nuclear licence is issued

The Atomic Act (Act No. 541/2004 Coll. on Peaceful Use of Nuclear Energy), which was prepared by the ÚJD (Úrad Jadrového Dozoru, Nuclear Regulatory Authority) of the Slovak Republic, was adopted by the National Council of the Slovak Republic on September 9, 2004 and came into force on 1 December 2004.

The Slovak Republic has two nuclear power stations located at the Bohunice and at the Mochovce site:

- Bohunice A1: HWGC, one reactor under decommissioning
- Bohunice V1: VVER, model V230, 1<sup>st</sup> reactor was shutdown in December 2006; 2<sup>nd</sup> reactor will be shutdown in December 2008
- Bohunice V2: VVER, model V213, 2 reactor units
- Mochovce 1, 2: VVER model V213 reactor units are operational.

#### 5.23.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Nuclear Regulatory Authority (Úrad Jadrového Dozoru – ÚJD) of the Slovak Republic is the successor of the former Czechoslovak Atomic Energy Commission. It was established on 1 January 1993 by the Act No. 2/1993, which defined its responsibilities and tasks and granted its autonomy in nuclear safety matters. This Act was replaced by the Act No. 575/2001 (as amended) which came into force on 1 January 2002. The ÚJD acts as the regulatory body responsible for issuing (and withdrawing) licences for the construction, operation and decommissioning of nuclear installations, except for site licences which are issued by regional environment offices on the basis of the Act 50/1976 Coll. on Territorial Planning and Construction Rules (Building Act) and on the decisions of the ÚJD. It is headed by a chairperson appointed by the Government. The website for ÚJD is <http://www.ujd.gov.sk>.

The ÚJD has two departments – one for inspection activities, based at Trnava and the other for safety policy and international cooperation, located at ÚJD headquarters in Bratislava.

The site licence is issued by the Regional Building Office after environmental impact assessment and after the permissions of the main regulatory bodies (nuclear safety, radiation protection and industrial safety).

5.23.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The ÚJD is responsible for the safety of nuclear installations, radioactive waste management, safeguards, control of nuclear materials, in short for the whole of the nuclear fuel cycle, as well as for the quality assurance programme in the nuclear industry. The UJD Regulation No. 53/2006 Coll. on Nuclear Material Management, Radioactive Waste Management and Spent Fuel Management gives requirements for all phases of management involving radioactive waste and spent fuel. The UJD Regulation No. 50/2006 Coll. on Requirements on Safety of Nuclear Installations for siting, design, construction, commissioning, operation, decommissioning of nuclear installations and closure of a repository requires the relevant documentation to be submitted to the ÚJD SR.

The Ministry of Economy is responsible for issuing licences, subject to the agreement of the ÚJD, for the use, import and export of nuclear material, equipment and technology. This Ministry is also responsible for the promotion of the nuclear power programme and for preparing related legislation.

The Public Health Authority (PHA) of the Slovak Republic (<http://www.uvzsr.sk>) under the Ministry of Health is responsible for radiation protection under the Act 126/2006 Coll. (Public Health Service Act).

An environmental impact assessment on commissioning, decommissioning and basic changes of nuclear installations according to the Act 24/2005 Coll. (Environmental Impact Assessment Act) has to be submitted by the license owner to the Ministry of the Environment. An EIA has also to be elaborated on strategic documents as the Concept and the National Programme on Radioactive Waste and Spent Nuclear Fuel Management, and submitted to the Ministry by the legal body which has issued these strategic documents.

The National Labour Inspectorate (<http://www.safework.gov.sk>) under the Ministry of Labour is responsible for industrial safety.

5.23.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The decommissioning policy is defined in the Atomic Act (541/2004 Coll.). The main provisions of the Act are:

- The operation licence holder is responsible for ensuring the decommissioning after the cessation of operation.
- The licence holder for the relevant stage of decommissioning is responsible for the decommissioning
- Before a planned termination of operation, the operation licence holder is responsible for submitting the relevant documentation which meets the scope of the conceptual decommissioning plan.
- The Nuclear Decommissioning Authority decides on the exemption of a nuclear facility from the effect of the Atomic Act on the basis of submitted documentation.

The National Nuclear Fund (NNF) for the decommissioning of nuclear installations and spent nuclear fuel and radioactive waste management administers and manages the finances on decommissioning, according to the Act 238/2006 Coll. (National Nuclear Fund Act) and its amendment i.e. the Act 528/2006 Coll. The NNF submits to the Ministry of Economy a proposal for a back-end nuclear energy strategy and its update on a 5-year basis for approval by the Government.



5.23.5 Legal requirement for quality assurance in decommissioning

The Quality assurance requirements are defined in the ÚJD Regulation 56/2006 Coll. (Requirements on the Licence Owner's QA, QA of Nuclear Installations and QA of Classified Equipment).

5.23.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The Environmental Impact Assessment Act (Act 24/2005 Coll.) defines provisions for the whole of the EIA process.

5.23.7 National policy defining stages of decommissioning of nuclear installations

The national policy in the area of decommissioning does not define decommissioning stages.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.23.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

For decommissioning, a new licence is required by the legislation. This licence for decommissioning is issued by the Nuclear Regulatory Authority. The licensee is required to submit the documentation according to the Atomic Act giving limits and conditions, the quality assurance system, the emergency planning, the physical protection, the radioactive waste management, the decommissioning programme, the financial assurance and so on. See also section 5.23.3.

5.23.9 Strategy specifying the approach to decommissioning

The decommissioning strategy is set down in the documentation to be submitted in connection with the request for siting, construction, operation, decommissioning and site release. At all stages of the nuclear facility lifetime there are requirements for the decommissioning process (initial decommissioning strategy, preliminary decommissioning plan, decommissioning plan, documentation for the decommissioning phase, and documentation for site release).

5.23.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

The time period for the amendment of the decommissioning plan for a defined decommissioning phase is 5 years. The relevant regulation is Regulation No. 49/2006 Coll. on periodic nuclear safety review.

5.23.11 Decay periods for radioactive materials within a particular stage of decommissioning

No particular period of decay is considered in the present legislation. A case-by-case system is followed.

5.23.12 Criteria for de-licensing a site

The criteria for the exemption of a nuclear facility from the scope of the Atomic Act are described in this Act and they are mainly the results of a final control of the radiation situation confirmed by an independent organization. The standpoint of the radiation protection authority is also required.

#### 5.23.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Discharges of radioactive materials in solid, liquid and gaseous phases are regulated by the Government Decree 345/2006 Coll. on EU BSS.

The approach is based on maximum effective individual dose for the critical member of the public from the release of radioactive material into the environment:

- individual dose of 50  $\mu\text{Sv}/\text{year}$  from material released in the workplace;
- individual dose of 250  $\mu\text{Sv}/\text{year}$  from gaseous and liquid discharges from nuclear installations in the area;
- individual dose of 10  $\mu\text{Sv}/\text{year}$  and collective dose of 1 man.Sv/year for unconditional release.

The discharge is regulated by the regulatory body responsible for radiation protection which is the Public Health Authority under the Ministry of Health. This regulatory body issues discharge authorisations.

#### 5.23.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The Slovak Republic follows the exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996).

#### 5.23.15 Waste categorisation scheme

Primarily, the IAEA waste categorisation scheme is followed, but with a slight variation. Radioactive waste is classified into three classes, as follows:

- a) Transition radioactive waste: the waste which would decay within the period of temporary storage and then may be cleared
- b) Low and Intermediate Level Waste (LILW): similar to the IAEA LILW category
- c) High Level Waste (HLW): similar to the IAEA HLW.

#### 5.23.16 Waste disposal facilities within the country

There are three radioactive waste treatment facilities, an interim spent fuel storage facility and a radioactive waste disposal facility at Mochovce. The near surface disposal facility situated at Mochovce accepts low and intermediate level short-lived radioactive waste. A programme for the development of a deep geological repository in Slovakia was started in 1996 when 15 potential sites were identified. Subsequently, the number has been reduced to 4 sites in two possible host rocks. Further research is followed by ÚJD SR to identify a final deep repository.

### **Part III: Radiological Protection**

#### 5.23.17 Radiological protection principles and standards

The radiological protection standards are in agreement with the European BSS.

#### 5.23.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

These provisions are implemented in:

- Act 126/2006 Coll. (Public Health Service Act)
- Act 355/2007 Coll. (Public Health Protection, Support and Growth Act)
- Governmental Decree 345/2006 Coll. on the Basic Safety Requirements on Radiation Protection of Staff and Public.

#### **Part IV: Industrial Safety**

##### 5.23.19 Regulatory body overseeing industrial safety

The National Labour Inspectorate is the regulatory body for industrial safety. Its website address is: <http://www.safework.gov.sk>.

##### 5.23.20 Statutory regulation controlling industrial safety

The statutory regulation controlling industrial safety includes:

- Act No. 124/2006 (Health and Safety Act)
- Act No. 125/2006 Coll. and amendments on Labour Inspection
- Act No. 479/2007 Coll. (Labour Codex)
- Act No. 261/2002 Coll. and amendments on Prevention of Serious Industrial Accidents.

There are also several other acts and decrees dealing with specific areas of industrial safety (health and safety in general, electricity, fire, explosives and toxic materials, noise, dust etc).

## **5.24 Slovenia**

The information for Slovenia was prepared mainly from documents available in the public domain.

#### **Part I: Institutional and Legal Aspects**

##### 5.24.1 Primary legislation under which a nuclear licence is issued

The Act on Protection against Ionising Radiation and Nuclear Safety was adopted by the Parliament of the Republic of Slovenia on 11 July 2002 (Off. Gaz. RS 67/2002 – hereinafter referred to as ‘2002 Act’) and entered into force on 1 October 2002. It repeals and replaces the Act on Radiation Protection and the Safe Use of Nuclear Energy adopted on 21 November 1984 and the Act on Protection against Ionising Radiation and Measures for the Safety of Nuclear Facilities and Equipment of 5 November 1980.

Slovenia has one nuclear power plant in operation (a PWR – 664 model of 632 MWe, Westinghouse two-loop PWR) at Krško in southern Slovenia, which commenced operations in 1981. The plant is jointly owned by Slovenia and Croatia on a 50/50 basis and supplies output to these two countries equally.

##### 5.24.2 National legislative/regulatory body empowered to issue a nuclear site licence

In 1991, the Slovene Nuclear Safety Administration (SNSA) was reorganised and placed under the Ministry of Environment, Spatial Planning and Energy. The SNSA is managed by a Director who is appointed for a period of five years by the Minister. The SNSA is responsible for:

- Nuclear safety – The Division of Nuclear Safety. This Division is divided into two sections. The first deals with licences, and the second produces and reviews safety analyses to support such licences.
- Radiation safety – The Division of Radiation Safety. It deals with radiation safety with the exception of medical and veterinary applications, radiation dosimetry and radiation monitoring.
- The Division of Nuclear and Radioactive Materials deals with trade, transport and treatment of such materials.
- The Division of Inspection and Control overviews compliance of safety requirements.
- The Division of Legal and International Cooperation Services.

5.24.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The SNSA is responsible for nuclear safety, radiological protection, nuclear operation and decommissioning activities.

On 27 February 2003, the Slovenian Radiation Protection Administration (SRPA) was established as a regulatory body within the Ministry of Health. The SRPA is responsible for medical and veterinary applications, protection of the population, monitoring of radioactive contamination of foodstuff and drinking water etc.

The Agency for Radioactive Waste Management (ARAO) which was established in 1991 is responsible for the final disposal of all types of radioactive waste.

5.24.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The national safety policy is to reduce detrimental effects on health from nuclear activities to the workforce and to the public as early as possible following decommissioning. The 2002 Act gives a clear definition of the responsibilities of the licensees, and follows principles such as the polluter pays principle, and justification and optimisation procedures.

Amendments to the 2002 Act were adopted on 29 April 2004 to reflect the provisions of the EU legal requirements as Slovenia became a full Member of the EU from 1 May 2004.

The energy policy of the government is outlined in the National Energy Programme which specifies sustainability, ecological acceptability and reliability of supplies as the main principles.

5.24.5 Legal requirement for quality assurance in decommissioning

The Slovenian Government developed the quality system in accordance with the standard ISO 9000:2000. Also the requirements defined in the IAEA document IAEA-TECDOC-1090, Quality Assurance within the Regulatory Bodies, and the IAEA Safety Series No. 50-C/SG-Q were implemented.

5.24.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

There is no information available in the public domain regarding a national statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning.

5.24.7 National policy defining stages of decommissioning of nuclear installations

There is no information available in the public domain regarding a national policy defining stages of decommissioning of nuclear installations.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.24.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

Information on a requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning is not known. The uranium mine of Žirovski Vrh was closed in 1990 for economic reasons and its decommissioning is now taking place.

5.24.9 Strategy specifying the approach to decommissioning

There is no information available in the public domain regarding the strategy specifying the approach to decommissioning.

5.24.10 Requirement for a Periodic Safety Report (PSR) as decommissioning progresses

There is a requirement for a Periodic Safety Report (PSR) as decommissioning progresses.

5.24.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no information available in the public domain regarding decay periods for radioactive materials within a particular stage of decommissioning.

5.24.12 Criteria for de-licensing a site

There is no information available in the public domain regarding the criteria for de-licensing a site.

5.24.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The authorised discharge limit to the general public living outside a 500 metre radius, from normal operations of the Krško nuclear plant is 50  $\mu\text{Sv}$  per year when all exposure pathways are taken into account. Additionally, there is an exposure limit of 200  $\mu\text{Sv}$  per year to the public from external sources of radiation. These dose limits dictate the discharge authorisation. Environmental surveillance of nuclear installations is defined in detail in the Regulations on Mode, Extent, and Frequencies of Monitoring of Radioactive Contamination in the Surroundings of Nuclear Facilities, Official Gazette SFRY, 51/86, based on the 1984 Act.

5.24.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

There is no information available in the public domain whether the country follows the exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996).

5.24.15 Waste categorisation scheme

There is no information available in the public domain whether the IAEA waste categorisation scheme is followed.

#### 5.24.16 Waste disposal facilities within the country

There are no waste disposal facilities for Spent Fuel (SF) or for LILW in Slovenia. There is, however, a storage facility at the Krško NPP site where all operational LILW waste is stored. There is also an interim storage facility at the Josef Stefan Institute (where a TRIGA Mark II research reactor, 250 kW is situated) at Podgorica near Ljubljana for LILW originating from all other producers.

The Agency for Radioactive Waste Management (ARAO) is evaluating potential sites for a LILW repository. According to the 2002 Act, the dates for siting and final disposal of LILW are 2008 and 2013 respectively.

### **Part III: Radiological Protection**

#### 5.24.17 Radiological protection principles and standards

The standards for radiological protection follow the IAEA Standards Series No. 115 (Off. Gaz. No. 49/04). The limit for the effective dose to the workers is 20 mSv per year and to the apprentices and students 6 mSv per year. The annual dose limit to the members of the public is 1 mSv per year.

#### 5.24.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

There is no evidence that this Directive has been transposed to the national legislative framework. However, standards and principles applicable within the country are in compliance with this Directive, as the IAEA Safety Standards Series No. 115 is followed.

### **Part IV: Industrial Safety**

#### 5.24.19 Regulatory body overseeing industrial safety

There is no information available in the public domain regarding a regulatory body overseeing industrial safety.

#### 5.24.20 Statutory regulation controlling industrial safety

There is no information available in the public domain regarding the statutory regulation controlling industrial safety.

## **5.25 Spain**

The information for Spain was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.25.1 Primary legislation under which a nuclear licence is issued

The primary legislation for the regulation of nuclear energy and radioactive substances is the Nuclear Energy Law L 25/1964 which established the responsibilities and the regulatory framework for the licensing of nuclear and radioactive installations, as well as for the protection of workers and the public from ionising radiation. The Nuclear Energy Law has been modified and developed subsequently by other Laws, Royal Decrees and Ministerial Orders.

At present, the legislation under which a licence is issued is a Royal Decree (RD) defined as “Nuclear Installations Regulations”, issued on December 3, 1999. This RD regulates the totality of administrative procedures for nuclear facilities/installations from the authorisation to decommissioning. It includes a chapter specifically dealing with decommissioning of nuclear installations. The full title of this decree is: “Real Decreto 1836/1999 de 3 de diciembre. Reglamento de instalaciones nucleares y radiactivas.” (<http://www6.mityc.es/energia/nuclear/archivos/RINR.pdf>, only available in Spanish).

#### 5.25.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Ministry of Industry, Tourism and Trade is responsible for ensuring compliance with the nuclear legislation and issuing operating licences, subject to a binding assessment report by the Nuclear Safety Council (CSN) (<http://www6.mityc.es/energia/nuclear>, only available in Spanish).

The Nuclear Safety Council (CSN) was set up under the Law L 15/1980 of 22 April, as the sole competent body for nuclear safety and radiation protection. It is totally independent from the government and from the rest of the Administration and it reports directly to the Parliament. It is responsible for regulating and supervising nuclear installations (<http://www.csn.es>, only available in Spanish).

The Ministry of the Environment participates in the licensing process, in collaboration with the CSN, for approval of the environmental impact report - a process which also includes the participation of the regional and local authorities in areas falling within their respective areas of competence (<http://www.mma.es/en/index.htm>, only available in Spanish).

#### 5.25.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The regulatory bodies are:

- The Ministry of Industry, Tourism and Trade (see Section 5.25.2, above)
- The Nuclear Safety Council (CSN) (see Section 5.25.2, above)
- The Ministry of the Environment (see Section 5.25.2, above).

A state owned company, called ENRESA, was set up in 1984 under the Royal Decree 1522/1884 to undertake decommissioning of nuclear installations and manage radioactive wastes. The costs of radioactive waste management and decommissioning are financed by the producers of such wastes. The financing of these responsibilities is by way of a fund set up for this purpose under the Royal Decree 1349/2003.

ENRESA operates as a management company and develops radioactive waste management programmes in accordance with the policy and the strategy approved by the Spanish Government. On successful completion of the environmental impact assessment by the Ministry of Environment, the site is temporarily transferred from the owner to ENRESA, as the organisation responsible for conducting decommissioning work. Such a transfer lasts until the completion of the decommissioning work when the site is returned to the original owner (<http://www.enresa.es/>).

#### 5.25.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The Royal Decree specifies the Government Policy and the administrative procedure for nuclear and radioactive waste management (see Section 5.25.1).

5.25.5 Legal requirement for quality assurance in decommissioning

A Quality Assurance Manual is one of the documents required for the decommissioning licence which is issued under the “Nuclear Installations Regulation”, 1999 (<http://www6.mityc.es/energia/nuclear/archivos/RINR.pdf>, only available in Spanish).

5.25.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The Spanish EIA legislation is based on Royal Legislative Decrees RLD 1306/1986 of 26 June and RLD 9/2000 of 7 October 2000. These RLDs incorporate the EU Directives 85/337/EC and 97/11/EC respectively (<http://www.enresa.es/>, “Institutional Reports” area, only available in Spanish).

Besides, there are several pieces of EIA legislation in the 17 different Autonomous Communities. Environmental competences are transferred to the autonomous regions (see the Spanish site at [www.penelope.uni-bremen.de](http://www.penelope.uni-bremen.de)).

5.25.7 National policy defining stages of decommissioning of nuclear installations

There are no defined stages of decommissioning. However, decommissioning has to start within three years after the removal of spent fuel from the reactor.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.25.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

There is no requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning.

5.25.9 Strategy specifying the approach to decommissioning

The Spanish standards define a technical-administrative procedure for approval of the Decommissioning Plan, proposed by ENRESA, by the CSN and the Ministry of Industry, Tourism and Trade. Subsequent to this, a positive evaluation is required from the Ministry of the Environment on the Environmental Impact Statement following a period of public consultation. It is at this point that the site is temporarily transferred from the owner company to ENRESA as the organisation responsible for carrying out decommissioning work. Such transfer lasts until the decommissioning operations are completed and then the site is returned to the original owner.

For the purposes of planning of operational nuclear power plants, decommissioning is to be taken to total dismantling (IAEA phase 3). This work is to be initiated three years after shutdown of the reactor and following removal of the spent fuel from their pools. This strategy has been confirmed for the case of José Cabrera Nuclear Power Plant and decommissioning plans are being prepared for the alternative of prompt dismantling (<http://www.enresa.es/>, “Institutional Reports” area, available in English).

5.25.10 Requirement for a Periodic Safety Report as decommissioning progresses

It is required to report regularly to the CSN on safety issues. This period is normally taken as one year.



5.25.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no specified period of decay. As mentioned in Section 5.25.9, decommissioning and dismantling is to be initiated three years after the shutdown and following the removal of spent fuels.

5.25.12 Criteria for de-licensing a site

The Ministry of Industry, Tourism and Trade is responsible for ensuring compliance with the nuclear legislation and for de-licensing a site, subject to a binding assessment report by the Nuclear Safety Council (CSN) on a case-by-case basis.

5.25.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The Nuclear Safety Council is responsible for ensuring that discharges are below those limits defined and approved on a case-by-case basis. European guidelines and recommendations are used as standards of reference.

5.25.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The criteria in the BSS are used as standards of reference but have to be approved on a case-by-case basis by the Nuclear Safety Council.

As for example, three levels of clearance had been approved by the CSN for the Vandellós 1 nuclear power plant and these are:

Levels	Materials classification	Materials management
> Specific conditional clearance N3	Contaminated and/or Activated	Radioactive Waste Radioactive waste management
> Generic conditional clearance N2		Clearance for specific practices Case-by-case management
> Unconditional clearance N1		Clearance for generic practices Streams management with controlled destination
< Unconditional clearance N1 Site Background	Not Contaminated	Conventional materials management

- Unconditional Clearance; which allows for the unrestricted reuse of materials having a radioactive content of less than N1 Levels These materials are managed as Conventional Materials. The N1 levels can be Global Total Specific Activity (N1g) or Isotopic Specific Activity (N1i), derived from the document TECDOC-855 (IAEA 1996).
- Generic Conditional Clearance; which allows for the reuse of materials with previously established restrictions, when materials have a radioactive content between N1 levels and N2 levels. For generic conditional clearance of materials and metallic equipment, the levels adopted are those specified in the document Radiation Protection 89, “Recommended Radiological Protection Criteria for the recycling of metals from dismantling of nuclear installations”. For generic conditional clearance of residual concrete materials from dismantling, the adopted levels and criteria are those specified in the document Radiation Protection 113, “Recommended radiological protection criteria for the clearance of building rubble from dismantling of nuclear installation”.

- Specific Conditional Clearance, which allows for the reuse of materials having a radioactive content below a third given level, with restrictions to be established and authorised on a case-by-case basis.

#### 5.25.15 Waste categorisation scheme

Those materials, which fail to satisfy the above defined clearance criteria are considered as wastes. They are classified according to their specific activity levels into one of the following categories:

- Very Low (Activity) Level Waste (VLLW): Those materials with activity below the limits proposed for the planned Spanish Very Low Activity Level Repository.
- Low and Intermediate (Activity) Level Waste (LILW): Those materials with activity above VLLW limits, while meeting the El Cabril Storage Unit acceptance criteria for specific activity.
- Intermediate Long Lived Waste (ILLW): Those materials exceeding the most restrictive specific activity limits for the El Cabril Storage Unit, requiring interim storage and final disposal similar to that of spent fuel and other high level wastes.

LILW may be subdivided, for operational reasons into two sub-levels: Level 1 for less radioactive wastes to be placed in the outer parts of the storage units, and Level 2 for more radioactive ones to be placed deep inside the storage units.

On the other hand, those residual materials that do not have radiological consequences, or that have been unconditionally cleared will be classified as follows:

- Conventional Waste: Those materials that do not contain radiological effects and do not present any hazardous or toxic character, and that may be managed without any restriction and disposed of in conventional urban or industrial waste dumps.
- Toxic and Hazardous Waste: Those materials which, although not containing radiological effects, must be managed by an authorised agent, and disposed of in specific sites because of their toxic or hazardous character, i.e., oils, asbestos, mercury, lead batteries, lead-containing paints, etc.

#### 5.25.16 Waste disposal facilities within the country

The Ministerial Order of October 5<sup>th</sup> 2001 granted a new operating permit to the El Cabril facility (Córdoba-Spain) for the disposal of low and intermediate level radioactive wastes (<http://www.enresa.es/>, “Activities” area, available in English).

With the local Council Authorisation in January 2003, a new facility for the treatment and conditioning of aggregate wastes (Very Low Level Wastes) arising from contamination incidents at installations not covered by the Regulation on Nuclear and Radioactive Facilities, has been licensed at El Cabril.

### **Part III: Radiological Protection**

#### 5.25.17 Radiological protection principles and standards

The Nuclear Safety Council (CSN) is the sole competent organisation in the field of nuclear safety and radiological protection and in general is responsible for regulating and supervising nuclear installations (<http://www.csn.es>, only available in Spanish).

5.25.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The European BSS are included in the Spanish Regulatory System through:

- The Royal Decree 1836/1999 of December 3 defined as “Nuclear Installations Regulations”(Reglamento de instalaciones nucleares y radiactivas), which regulates the complete administrative procedure for nuclear and radioactive installations from the authorisation to the decommissioning activities (<http://www6.mityc.es/energia/nuclear/archivos/RINR.pdf>, only available in Spanish).
- The Royal Decree 783/2001 of July 6 defined as “Sanitary Protection Regulation against Ionizing Radiation” (Reglamento de protección sanitaria contra las radiaciones ionizantes), which considers the radiation protection regulation of workers and public (<http://www.mtas.es/insht/legislation/RD/radiaciones.htm>, only available in Spanish).

#### **Part IV: Industrial Safety**

5.25.19 Regulatory body overseeing industrial safety

The Ministry of Labour and Social Affairs is the sole responsible for ensuring compliance with the industrial safety legislation (<http://www.mtas.es/>, only available in Spanish).

5.25.20 Statutory regulation controlling industrial safety

The Spanish Industrial Safety legislation is based on Law 31/1995 of November 8 on “Prevention of Labour Risks” (Prevención de Riesgos Laborales), which complies with Directive 89/391/CEE (<http://www.mtas.es/Guia2005/leyes/L3195.html>, only available in Spanish).

This Law has been actualised in Law 54/2003 of December 12 on “Legislative Framework Revision on Prevention of Labour Risks” (Reforma del Marco Normativo de la Prevención de Riesgos Laborales) (<http://www.mtas.es/Guia2005/leyes/L5403.htm>, only available in Spanish).

### **5.26 Sweden**

The information for Sweden was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

#### **Part I: Institutional and Legal Aspects**

5.26.1 Primary legislation under which a nuclear licence is issued

The Act on Nuclear Activities (SFS 1984:3) defines the licensing requirements for the construction and operation of nuclear facilities.

5.26.2 National legislative/regulatory body empowered to issue a nuclear site licence

The mechanism for issuing licences for nuclear activities is indicated in Figure 5.26.1 below.

5.26.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The regulatory body for nuclear safety is the Swedish Nuclear Power Inspectorate (SKI) which exercises its authority under the Act on Nuclear Activities.

For radiation protection, the Swedish Radiation Protection Authority (SSI) is responsible and the relevant Act is the Radiation Protection Act (1988:220).

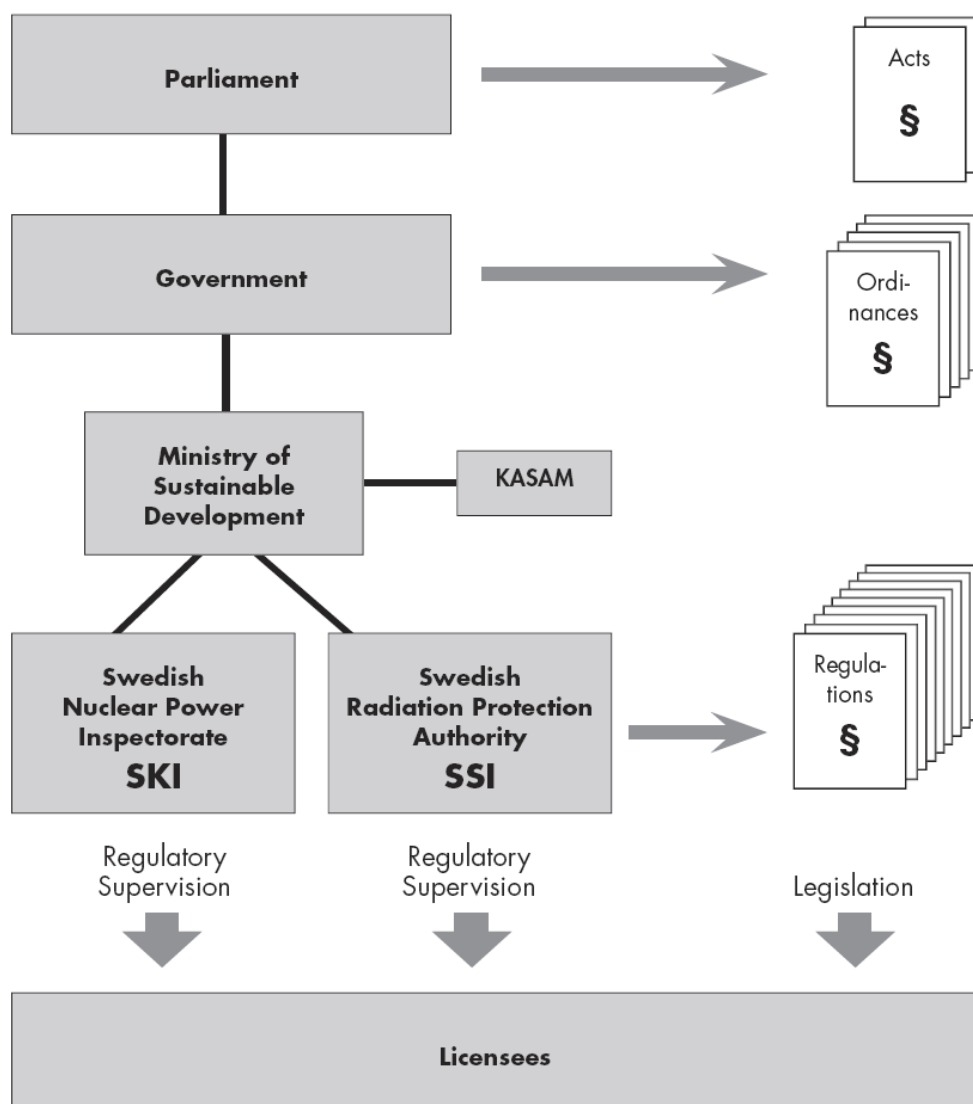
Both SKI and SSI are central administrative authorities reporting to the Minister of the Environment at the Ministry of Sustainable Development.

The Act on the Financing of Future Expenses for Spent Nuclear Fuel etc. (1992:1537) deals with the main financial aspects, and defines the responsibilities pertaining to the management and disposal of spent nuclear fuel and radioactive waste.

Environmental protection: Swedish Environmental Protection Agency and the Act is the Environmental Code (1998:808).

Industrial safety: Swedish Work Environment Authority.

Figure 5.26.1 Organisational structure for nuclear safety and radiation protection regulatory control



- 5.26.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

There is no information available in the public domain regarding the national regulatory policy and/or Government policy for decommissioning of nuclear facilities in Sweden.

- 5.26.5 Legal requirement for quality assurance in decommissioning

The requirements for quality assurance in decommissioning are defined according to regulations issued by SSI and SKI.

- 5.26.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The national statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning is stated in the Ordinance on Environmental Impact Assessments (SFS 1998:905).

- 5.26.7 National policy defining stages of decommissioning of nuclear installations

No such policy exists on a national level. However, the national policy on decommissioning is regulated under the SSI FS 2002:4, Regulations on the Planning Before and During Decommissioning of Nuclear Facilities. These regulations contain provisions concerning the planning of the decommissioning of nuclear facilities in matters of importance from a radiation protection point of view. Requirements are put on decommissioning planning and other administrative measures such as documentation before and during decommissioning and reporting to the SSI at different stages of a facility's life cycle.

## **Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

- 5.26.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

A specific licence for decommissioning and dismantling operations is needed according to the Environmental Code (1998:808). The licence is issued by a regional environmental court. No such license has yet been issued in Sweden, but a license will be subject to certain conditions.

The existing licence for nuclear activities continues. The preliminary decommissioning plan for a facility shall be updated and incorporated in the revised safety report. The safety report shall be reviewed and approved by the Swedish Nuclear Power Inspectorate.

- 5.26.9 Strategy specifying the approach to decommissioning

According to the regulations of the SSI and the SKI, respectively, the licensee shall make plans for future decommissioning. The plans shall be more detailed when the facility has been shut down and before actual dismantling. This is regulated in SSI FS 2002:4 and SKI FS 2004:1. The latter also prescribes that, if there are several facilities located on one site, the decommissioning plan for each facility should be based on a general decommissioning plan or decommissioning strategy for the entire site.

5.26.10 Requirement for a Periodic Safety Report as decommissioning processes

Not a formal PSR is required, but the preliminary decommissioning plan shall be updated and the safety report shall be revised. The revised safety report shall be reviewed and approved by the Swedish Nuclear Power Inspectorate.

5.26.11 Decay periods for radioactive materials within a particular stage of decommissioning

No such periods are defined on a national level. It depends on the strategy selected by the licensee.

5.26.12 Criteria for de-licensing a site

No criteria have yet been established.

5.26.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

Discharges are regulated by the SSI (SSI FS 2000:12, Regulations on the Protection of Human Health and the Environment from Discharges of Radioactive Substances from certain Nuclear Facilities). There are regulations for clearance of goods and oil (SSI FS 1996:2). The regulations of discharges to air and sea do not cover dismantling, but this can be covered on the basis of case-by-case decisions by the SSI.

5.26.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

Exemption criteria are defined as in the European BSS. The clearance criteria are: 500 Bq/kg for beta and gamma emitters and 100 Bq/kg for alpha emitters. However, these are under revision to make them compatible with the EU recommendations.

5.26.15 Waste categorisation scheme

Waste categorization is based upon criteria for the available disposal facilities.

5.26.16 Waste disposal facilities within the country

SFR-1 at the Forsmark site is a repository for low and intermediate level operational waste (up to 500 mSv/h).

Shallow land disposal facilities for low level waste (up to 0.5 mSv/h) are at the Forsmark, Oskarshamn, Ringhals and Studsvik sites.

**Part III: Radiological Protection**

5.26.17 Radiological protection principles and standards

According to the SSI regulations (SSI FS 1998:4), the dose limit for members of the public is 1 mSv per year from all contributing artificial radiation sources. This limit is also in accordance with the EU BSS.

5.26.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) have been implemented in the national regulatory system.

## **Part IV: Industrial Safety**

### 5.26.19 Regulatory body overseeing industrial safety

The regulatory body overseeing industrial safety is the Swedish Work Environment Authority.

### 5.26.20 Statutory regulation controlling industrial safety

The statutory regulation controlling industrial safety is the Swedish Work Environment Act (SFS 1977:1160).

## **5.27 United Kingdom**

The information for the United Kingdom was prepared mainly from the response to the questionnaire sent to the contact person listed in Annex 3.

### **Part I: Institutional and Legal Aspects**

#### 5.27.1 Primary legislation under which a nuclear licence is issued

The original legislation under which a nuclear site licence is issued was the Nuclear Installations (Licensing and Insurance) Act 1959. That Act was subsequently amended as the Nuclear Installations Act 1965 (as amended) (NIA 65).

#### 5.27.2 National legislative/regulatory body empowered to issue a nuclear site licence

The Health and Safety Executive (HSE) of the Health and Safety Commission (HSC) is responsible for issuing a nuclear site licence. The Nuclear Directorate with the operating arm of the Nuclear Installations Inspectorate (NII) is responsible for issuing licences for nuclear installations under the NIA 65 (as amended). The NII carries out this responsibility by evaluating the safety case, submitted by the licence applicant, prior to issuing the licence. The Chief Inspector of the NII is empowered to issue a site licence. But before issuing a licence, NII consults the environmental regulatory bodies (EA and SEPA) about environmental issues.

#### 5.27.3 Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety

The Department for Business, Enterprise and Regulatory Reform (DBERR) (previously, Department of Trade and Industry (DTI)) has the policy responsibility for decommissioning and nuclear site security. The Nuclear Decommissioning Authority (NDA) which oversees legacy nuclear problems (decommissioning) is functionally responsible to the DBERR.

The Department for Environment, Food and Rural Affairs (DEFRA) has policy responsibility for health and safety laws and standards. The HSC is appointed by and reports to the secretary of state for the DEFRA. The secretary of DEFRA is also responsible for radioactive waste management. The Radioactive Substances Division of DEFRA is the relevant organisation for waste management.

The Department of Transport, Local Government and Regions (DTLR) has responsibility for the regulation of radioactive material/waste transport. The Radioactive Materials Transport Division (RMTD) of DTLR is the relevant department.

5.27.4 National regulatory policy and/or Government policy for decommissioning of nuclear facilities

The Government Policy on decommissioning of nuclear installations is set out in the Government publication 'Review of Radioactive Waste Management Policy – Final Conclusions', Cm 2919, July 1995. The major elements of the policy are:

- (i) the process of decommissioning should be carried out as soon as possible, taking account of all relevant factors
- (ii) it is the responsibility of the operator to draw up a decommissioning strategy for regulatory approval
- (iii) regulatory approval by HSE/NII is given on a case-by-case basis
- (iv) hazards associated with decommissioning should be reduced in a systematic and progressive way.

5.27.5 Legal requirement for quality assurance in decommissioning

It is a legal requirement that the licensee/contractor would establish a programme in compliance with ISO 9001 and/or ISO 14001 for all activities affecting the safety case.

5.27.6 National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning

The requirements of this Directive have been incorporated into the UK law through the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR 99). The EIADR 99 regulations require that an Environmental Impact Assessment (EIA) be carried out by the licensee before HSE considers granting consent for the decommissioning project of a nuclear reactor to commence. The HSE consults Environment Agencies and the public on the Environmental Statement provided by the licensee and attach conditions to the consent to the project.

5.27.7 National policy defining stages of decommissioning of nuclear installations

There are no nationally defined stages of decommissioning, although accounts are taken of the IAEA defined three stages of decommissioning. The principle is to decommission a facility as early as possible taking safety, security, social and economic factors into account.

**Part II: Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan**

5.27.8 Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning

In the UK, the operational licence is carried through to the decommissioning of the facility. It is the responsibility of the licensee to prepare a programme for decommissioning of the facility. Licence Condition 35 gives HM NII the power to direct the licensee to commence decommissioning of a facility to prevent it being left in a dangerous condition or to ensure decommissioning takes place as per national strategy.

5.27.9 Strategy specifying the approach to decommissioning

An outline strategy for decommissioning is given at the design stage. During the operational period, the decommissioning strategy is revised and upgraded in the periodic safety review documents. Before the cessation of operation, a decommissioning plan is produced and that defines the decommissioning programme.



#### 5.27.10 Requirement for a Periodic Safety Report as decommissioning progresses

Although there are no legal requirements for periodic safety reports during decommissioning, periodic reports (yearly and three-yearly) are produced giving details of progress, safety aspects and financial positions etc.

#### 5.27.11 Decay periods for radioactive materials within a particular stage of decommissioning

There is no defined period of decay. Any decay period is implemented on a case-by-case basis.

#### 5.27.12 Criteria for de-licensing a site

A site is de-licensed on an unconditional basis (green field site) if there is no longer any danger from ionising radiation. If there are some residual risks, the site may not be released as green field site, but may qualify to be released conditionally as 'brown field' site.

#### 5.27.13 Regulation of discharges of radioactive materials in solid, liquid and gaseous phases

The primary legislation for the regulation of disposal and dispersal radioactive wastes (solid, liquid and gaseous) is the Radioactive Substances Act, 1993. This Act is in agreement, both in principle and in implementation strategy, with the Environmental Protection Act, 1990.

The Radioactive Substances Division (RAS) of the Department for Environment, Food and Rural Affairs (DEFRA) is responsible for DEFRA's environmental interests in radioactive matters including radioactive discharges, contaminated land, response to overseas radiological emergencies etc. The RAS works closely with the Environment Agencies which deal with the control of radioactive wastes and discharges and Health and Safety Executive which deals with workers' safety in UK nuclear sites.

In England and Wales, control under the RSA 93 is exercised by the Chief Inspector of the Environment Agency (EA). In Scotland, control under the Act is exercised by the Scottish Environmental Protection Agency (SEPA). These bodies are responsible for issuing discharge authorisations.

#### 5.27.14 Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)

The principles of exemption and clearance criteria of the BSS are in general followed within the country. The basis radiological criterion for exemption is that the dose from exempt practice or source should not exceed  $10 \mu\text{Sv.y}^{-1}$ .

#### 5.27.15 Waste categorisation scheme

Waste is categorised mainly on activity concentrations. Four levels of waste are specified:

- (i) Very Low Level Waste (VLLW): activity concentration between  $0.4$  to  $4 \text{ Bq.g}^{-1}$   $\beta/\gamma$  or  $40 \text{ kBq}$  of  $\beta/\gamma$  per single item,  $\alpha$  activity is not generally allowed
- (ii) Low Level Waste (LLW): activity concentration higher than  $4 \text{ Bq.g}^{-1}$  but less than  $4 \text{ kBq.g}^{-1}$  of  $\alpha$  or  $12 \text{ kBq.g}^{-1}$  of  $\beta/\gamma$
- (iii) Intermediate Level Waste (ILW): activity concentration higher than LLW but less than HLW
- (iv) High Level Waste: waste of very high concentration or heat generating capacity.

5.27.16 Waste disposal facilities within the country

There is one low level waste disposal facility at Drigg in Cumbria. There are no intermediate level and high level waste disposal facilities in the country.

**Part III: Radiological Protection**

5.27.17 Radiological protection principles and standards

The radiological protection provisions of the European BSS have been incorporated in the Ionising Radiations Regulations, 1999 (IRRs 99) and this is the regulatory document for radiological protection over whole of the UK.

5.27.18 Implementation of the provisions of the BSS (EC Directive 96/29/Euratom of 13 May 1996) in the national regulatory system

The HSE/NII is the regulatory body overseeing radiological protection of the workers and the public from licensed nuclear sites. The EA in England and Wales and the SEPA in Scotland oversee effects from discharges from licensed sites and activities involving radioactivity in unlicensed sites.

**Part IV: Industrial Safety**

5.27.19 Regulatory body overseeing industrial safety

The Health and Safety Executive (HSE) is responsible for industrial safety under the HSWA 74.

5.27.20 Statutory regulation controlling industrial safety

The primary legislation dealing with the safety in industrial installations is the Health and Safety at Work etc. Act, 1974.

## 6. Conclusions and recommendations

The European Union with 27 Member States of diverse socio-political and economic background represents a very wide spectrum of nuclear achievements, aspirations and views. The views and aspirations amongst the Member States can be identified into three distinct strands:

- Member States such as Cyprus and Malta which do not have nuclear activities of any significance and consequently are not keen to support or undertake nuclear activities;
- Member States such as Austria, Denmark, Greece and Ireland who do have some nuclear activities, but are not favourably disposed towards nuclear activities or their expansion due to a variety of reasons;
- Member States such as Bulgaria, France, Slovakia, United Kingdom and so forth are active proponents of nuclear expansion in order to meet their national energy demands and create a diversity of energy sources.

With such a diversity of opinions at the national levels as well as by the public, the nuclear activities amongst Member States vary enormously. Needless to say, with the national opinion goes the legal and regulatory activity of a country.

It may, however, be pointed out that nuclear decommissioning and the management of radioactive wastes are relevant only to Member States which had nuclear activities for a long period of time and now some facilities have come to the end of their operational life spans. Those Member States have developed nuclear industries, skilled workforce and high safety standards. On the other hand, some of the Member States, though keen to embrace or expand activities in the nuclear field, inherit safety standards which do not necessarily comply with the Western European standards (WENRA requirements) or best European practice. This divergence in safety standards is significant and needs addressing.

Over the years, the European Commission had produced a multiplicity of Directives, Regulations and Guidelines dealing with various aspects of nuclear safety for the protection of the public and the environment. All Member States benefit from such EC promulgations, especially those States with less developed nuclear programmes. Almost all the Member States are aware of such promulgations and obligations, but the process of consolidation within the State could be quite challenging and time consuming.

In view of this problem and other associated socio-political framework of a country, the following recommendations can be made in order to harmonise the safety standards across the whole of the European Union:

1. The European Commission should be more focussed in producing promulgations (Directives, Regulations and Guidelines etc) so that the Member States can easily assimilate them into their national legislative bodies
2. Technical assistance should be provided by the European Commission to those Member States who would face difficulty in consolidating or transposing these promulgations into their legislative bodies and implementing them properly. This technical assistance may take the form of offering expertise to those countries, helping them to formalise these promulgations into legislative framework.
3. Another way of offering technical assistance may be the setting up of workshops, training programmes etc for the technical experts, stakeholders, regulators as well as for interested members of the public bodies dealing with the issues in question.
4. The European Commission should also establish a mechanism to monitor the progress of assimilating and enforcing these promulgations within individual Member States.

## **7. References**

- [1] European Commission Council Directive 96/29/Euratom of 13 May 1996, laying down basic safety standards for the protection of the health of workers and the general public against the dangers from ionising radiation, OJ L 159, Vol. 39, 29.6.96.
- [2] European Commission Council Directive 97/11/EC of 3 March 1997 amending Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment, OJ L 073, 14.3.97 amending OJ L 175 5.7.85.
- [3] European Commission Directive 2001/42/EC of the Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, OJ L 197 21.7.01.
- [4] European Commission Recommendation of 15 September 1999 on a classification system for solid radioactive waste, 1999/669/EC, Euratom, OJ L 265 13.10.99.

## Annex 1

### Questionnaire related to Institutional, Legal and Regulatory Aspects; Licensing and Decommissioning Plan; Radiological Protection and Industrial Safety

#### Part I Institutional and Legal Aspects

- 1 What is the primary legislation under which a nuclear licence is issued?
- 2 Is there a national legislative/regulatory body empowered to issue a nuclear site licence?
- 3 Are there different legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety?
- 4 Is there a defined national regulatory policy and/or Government policy for decommissioning of nuclear facilities?
- 5 Is there a legal requirement for quality assurance in decommissioning work?
- 6 Is there a national statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on Environmental Impact Assessment (EIA) for decommissioning work?
- 7 Is there a national policy defining stages of decommissioning of nuclear installations?

#### Part II Regulatory Aspects - Licensing and De-licensing including Decommissioning Plan

- 8 Is there a requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning work?
  - (i) If so, who is authorised to issue such a licence?
  - (ii) Are there any conditions attached to the new licence?
  - (iii) If not, does the existing site licence continue without modifications or are there provisions for modifications for decommissioning work to progress?
- 9 Is there a defined strategy specifying approach to decommissioning work?
- 10 Is there a requirement for a Periodic Safety Report as decommissioning work progresses?
- 11 Are there defined decay periods for radioactive materials within a particular stage of decommissioning?
- 12 What are the criteria for de-licensing a site?
- 13 How are discharges of radioactive materials in solid, liquid and gaseous phases regulated?
  - (i) If there is a primary legislation for discharges, please give the full reference of this legislation.
  - (ii) Please describe the salient points briefly.
  - (iii) Who is authorised to issue discharge authorisation?
- 14 Does the country follow exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)?
- 15 Is the IAEA waste categorisation scheme followed?

16 Are there waste disposal facilities within the country?

(i) If so, please name those facilities and describe briefly their waste acceptance criteria.

**Part III Radiological Protection**

17 What are the radiological protection principles and standards?

18 Are the provisions of BSS (EC Directive 96/29/Euratom of 13 May 1996) already implemented in the national regulatory system?

**Part IV Industrial Safety**

19 Is there a regulatory body overseeing industrial safety?

20 What is the statutory regulation controlling industrial safety? Please provide the reference of the regulatory document and describe the main points briefly?

## Annex 2

### Overview of Decommissioning Regulatory Issues in Selected EU Member States

Issue	Austria	Belgium	Bulgaria	Czech Republic	Denmark
Primary legislation under which a nuclear site licence is issued	Radiation Protection Act of 11 June, 1969 (Federal Law Gazette No. 227/1969) (as amended).	The Royal Decree of 28 February 1963 gives general regulations. Under the Royal Decree of July 20, 2001, the King gives authorization for Class I facilities.	'Act on the safe use of nuclear energy', promulgated in the State Gazette No. 63 of June 28, 2002.	Atomic Act – Act No. 18/1997 Coll. and Act No. 13/2002 Coll.	The Nuclear Installation Act No. 170 of 16 May 1962.
National legislative/regulatory body empowered to issue a nuclear site licence	Federal Minister for Agriculture, Forestry, Environment and Water Management (BMLFUW).	Federal Agency for Nuclear Control (FANC/AFCN).	The Nuclear Regulatory Agency (NRA).	The State Office for Nuclear Safety (SÚJB).	The Ministry of Interior for all three permits - site approval, construction and operations.
Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety	Provisions for licensing, inspection and regulation of nuclear facilities are delegated to different public authorities at federal, provincial and communal levels.	FANC/AFCN is responsible for licensing, de-licensing and radiological protection. Regional authorities are responsible for EIA. The Federal Ministry of Employment and Labour is responsible for industrial safety.	NRA is the nuclear regulatory body. The Ministry of Environment and Waters is responsible for EIA. The General Labour Inspectorate oversees industrial safety regulatory aspects.	The SÚJB is responsible for all nuclear issues including radiological protection. The Ministry of Environment is responsible for environmental issues. The State Labour Office is responsible for industrial safety.	Nuclear Regulatory Authorities – the Nuclear Office under the Danish Management Agency and the National Institute of Radiation Hygiene under the National Board of Health.
National regulatory policy and/or Government policy for the decommissioning of nuclear facilities	No national or Government policy is in existence, as nuclear decommissioning is non-existent in Austria.	No overall Government policy, except for Belgian Phase Out Act (31 January 2003) and the revision of funding for decommissioning.	The national regulatory policy consists of authorisation of decommissioning of a facility as per legislative requirements and maintenance of financial resources.	No national or Government policy on decommissioning exists. However, decommissioning sites can only be used for commercial activities, when the control under the Atomic Act is rescinded.	Government policy, as per Parliamentary decision in March 2003, is to decommission all nuclear facilities at Risø as soon as possible within a timeframe of 20 years. There is no NPP in Denmark.
Legal requirement for quality assurance in decommissioning	Radiation Protection Act – Article 5 to 7.	No legal requirement for quality assurance in decommissioning.	ASUNE Regulation.	Decree of the SÚJB No. 132/2008 Coll.	Based on the Nordic NARS system and the general quality assurance of DS/EN ISO 9001, version 2000.
National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on EIA for decommissioning	Environmental Impact Assessment Act, Federal Law Gazette No. 697/1993, as amended in 1997 and 2002.	The Royal Decree of July 20, 2001, C-2001/ 00726 enforces the EC Directive.	The Act on Environmental Protection' came into force in September 2002. It was last amended in January 2005.	Act No. 100/2001 Coll. is the EIA Act.	EC Directive 97/11/EC of 3 March 1997 on EIA on decommissioning is implemented although such a requirement is not enshrined in the legislative framework.
National policy defining stages of decommissioning of nuclear installations	The IAEA defined stages of decommissioning are followed.	Approval is given on a case-by-case basis.	There are no nationally defined stages of decommissioning. The Decommissioning Plan specifies the stages.	Generally, IAEA 3-stage decommissioning is followed.	IAEA three stages of decommissioning are followed.
Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning	If EIA is deemed necessary, a separate decommissioning licence is required. The Provincial Governor issues a licence, as per Federal Law Gazette No. 697/1993 as amended.	Article 17 of the Royal Decree of July 20, 2001. The licence period is specified in the licence.	A decommissioning permit from the NRA Chairman is required. A permit for each stage with terms and conditions applies.	Licences for individual decommissioning stages are required.	With the Danish Decommissioning under the Ministry of Science, Technology and Innovation.

Issue	Austria	Belgium	Bulgaria	Czech Republic	Denmark
Strategy specifying the approach to decommissioning	Radiation Protection Act – Articles 5 to 7 – defines requirements for a decommissioning plan.	A decommissioning plan describes the strategy including the implementation procedures.	ASUNE requirements and State Gazette No. 73, 2004.	Atomic Act 18/1997 Coll. requires a decommissioning plan to contain a strategy for decommissioning for licence submission to the SÚJB.	To decommission all facilities at Risø within 20 years. LILW will be stored at Risø in concrete containers in a storage hall.
Requirement for a Periodic Safety Report (PSR) as decommissioning progresses	PSR forms part of the licensing requirements.	For Class I facilities, a PSR is required for every 5 years.	No requirement for a PSR. But an updated safety report on completion of each stage of decommissioning is required.	No specific requirement for a PSR. It forms a part of the licensing requirements.	No requirement for a PSR.
Decay periods for radioactive materials within a particular stage of decommissioning	Dependent on the individual facility.	A decay period is based on case-by-case considerations.	A case-by-case approach is followed.	A case-by-case consideration is given.	A decay period is dependent on the type of waste.
Criteria for de-licensing a site	De-licensing based on exemption and clearance criteria follows the German Radiation Protection Ordinance.	A free release certificate based on clearance levels is required.	No de-licensing provision exists. However, radiological criterion of $10 \mu\text{Sv.y}^{-1}$ public dose applies.	Criteria are based on clearance levels.	Criteria are based on clearance criteria under the Health Order No. 192 of 2 April 2002.
Regulation of discharges of radioactive materials in solid, liquid and gaseous phases	Article 74 of Radiation Protection Ordinance, Federal Law Gazette II No. 191/2005.	Royal Decree of 20 July 2001.	EC Directive 96/29/Euratom is followed and limits and conditions are attached in the licensing process.	Atomic Act 18/1997 and the Decree No. 307/2002 Coll. as amended by Decree No. 499/2005 Coll.	Promulgations by the Nuclear Regulatory Authorities following best international practices.
Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)	As per German Radiation Protection Ordinance.	Royal Decree of 20 July 2001.	The EU recommendations on clearance criteria are followed.	The EU Directive is followed.	Clearance is regulated by the Ministry of Interior under the Health Order No. 192 of 2 April 2002.
Waste categorisation scheme	The IAEA waste categorisation scheme is followed.	For long term management (>30 y), the IAEA scheme is followed.	The IAEA waste categorisation scheme is followed.	The IAEA waste categorisation scheme is followed.	Primarily the EC recommendation (1999/669/ EC, Euratom) is followed.
Waste disposal facilities within the country	A central waste processing and storage facility is in Seibersdorf, which is under the responsibility of NES.	No waste disposal facility in the country. However, there are two temporary storage facilities – one at Dessel and the other in Mol.	No waste disposal facility is available within the country. The Novi Han facility (1960s to 1994) is now closed.	Repository Richard (for institutional RAW), repository Bratrstvi (for natural radio-nuclides) and repository Dukovany (for RAW from NPPs) are in operation.	No disposal facility is available at present.
Radiological protection principles and standards	Federal Minister for Agriculture, Forestry, Environment and Water Management (BMLFUW).	Same as European BSS, under Royal Decree of 20 July 2001.	The Nuclear Regulatory Agency (NRA).	The State Office for Nuclear Safety (SÚJB).	Based on the European BSS.
Implementation of EC Directive 96/29/Euratom of 13 May 1996 on the BSS	Radiation Protection – EU Adaptation Act (BGBl No. 146/2002), August 2002.	The Royal Decree of July 20, 2001.	‘Regulation for the basic norms for radiation protection’, promulgated in State Gazette No. 73, 2004.	Decree No. 307/2002 Coll. as amended by Decree No. 499/2005 coll. covers the European BSS.	National Board of Health Order No. 823 of 31 October 1997.
Regulatory body overseeing industrial safety	Austrian Labour Inspectorate.	The Federal Ministry of Employment and Labour.	General Labour Inspectorate of the Executive Agency.	The State Labour Inspection Office.	Danish Working Environment Authority under the Ministry of Employment.
Statutory regulation controlling industrial safety	Federal Gazette No. 27/1993 and Federal Gazette No. 450/1994.	Act of 4 August 1996.	State Gazette No. 124/1997 on ‘Law on Health and Safe Working Conditions’.	Act No. 174/1968 Coll. on work safety and Act No. 258/2000 Coll. on public health.	Danish Working Environment Act, 1999 and subsequent Executive Orders.



## Annex 2

### Overview of Decommissioning Regulatory Issues in Selected EU Member States (Contd.)

Issue	Estonia	Finland	France	Germany	Greece
Primary legislation under which a nuclear site licence is issued	The Radiation Act of 8 May 1997.	The Nuclear Energy Act of 11 December 1987 (as amended).	Law 61-842 of 2 August 1961 on atmospheric pollution and its application Decree 63-1228 of 11 December 1963 are the primary legislation.	Atomic Energy Act of 23 Dec 1959, amended on 27 April 2002, prohibits any further issue of licence for nuclear power generation.	Decree Law 854 of 15 March 1971 and Presidential Decree No. 610 of 23 August 1978.
National legislative/regulatory body empowered to issue a nuclear site licence	The Estonian Radiation Protection Centre (ERPC), under the Ministry of Environment, is responsible for issuing a licence.	The Ministry of Trade and Industry (MTI)/Radiation and Nuclear Safety Authority (STUK).	French Nuclear Safety Authority, ASN ( <i>Autorité de Sureté Nucléaire</i> ).	BMU (Federal Agency) is the regulatory body. The Länder (Federal States) are empowered to execute administrative duties (licensing and supervision).	The Ministry for Development is the licensing authority following recommendations from the GAEC.
Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety	ERPC is responsible for radiation protection and environmental issues.	MTI is the main responsible body. The STUK is the body for the regulatory control of radiation and nuclear safety. The Ministry of Environment is responsible for waste management.	ASN is responsible for nuclear safety and radiological protection.	BMU is responsible for nuclear safety and radiation protection. BFS is responsible for licensing of transport of nuclear fuel as well as storage of nuclear fuel. The Länder authority implements the government environment policy.	The Greek Atomic Energy Commission is the regulatory body for radiological protection.
National regulatory policy and/or Government policy for the decommissioning of nuclear facilities	No information is available in the public domain.	Government decision in 1983 and supported by MTI that a decommissioning plan be prepared by the licensee and updated every five years.	The policy is to ensure protection of individuals and the environment. Waste producers are to dispose of waste in a suitable manner.	The amendment to the Atomic Energy Act requires phasing out of nuclear power plants after generating a pre-defined amount of energy. Following decommissioning, the strategy is to dismantle at the earliest opportunity.	There are no decommissioning activities in Greece.
Legal requirement for quality assurance in decommissioning	No information is available in the public domain.	Section 35 and 36 of the Nuclear Energy Decree.	There is a legal requirement for quality assurance.	The QA programme follows the Länder (Federal States) requirements.	There are no decommissioning activities in Greece.
National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on EIA for decommissioning	Environmental Impact Assessment and Environmental Auditing Act of 1 January 2001.	The particular Directive has not been implemented, although EIA requirements are available.	EC Directive 97/11/EC of 3 March 1997 on EIA on decommissioning is implemented.	The EIA Act of Sept 2001 requires implementation of the EC Directive.	The Radiation Protection Regulation implements the EC Directive.
National policy defining stages of decommissioning of nuclear installations	No information is available in the public domain.	Government decision in 1983 and supported by MTI that a decommissioning plan be prepared by the licensee and updated every five years.	Three stages of decommissioning are followed without any delay time between the stages.	The operator decides either immediate or deferred dismantling on a case-by-case basis.	There are no decommissioning activities in Greece.

<b>Issue</b>	<b>Estonia</b>	<b>Finland</b>	<b>France</b>	<b>Germany</b>	<b>Greece</b>
Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning	No information is available in the public domain.	Operating licences (for 10 - 20 years) (which are renewable) are considered adequate for decommissioning work.	A new administrative note dated 17 <sup>th</sup> Feb 2003 requires a separate licence.	A separate licence for decommissioning is required. The Länder regulatory body issues the decommissioning licence.	There are no decommissioning activities in Greece.
Strategy specifying the approach to decommissioning	No information is available in the public domain.	Strategy is based on case-by-case considerations.	Cessation of operation is to be communicated to the DGSNR by the licensee and the safety case is to be produced.	Following cessation of operational licence (and fuel removal), decommissioning starts and the strategy is based on practical considerations.	There are no decommissioning activities in Greece.
Requirement for a Periodic Safety Report (PSR) as decommissioning progresses	No information is available in the public domain.	A PSR is required to be submitted to STUK.	DGSNR requires a PSR.	The Länder authority requires safety reports at regular intervals.	There are no decommissioning activities in Greece.
Decay periods for radioactive materials within a particular stage of decommissioning	No information is available in the public domain.	A decay period is given on a case-by-case assessment.	The decay period is dependent on the type of waste.	Delay and a consequent decay period is enforced due to the lack of a disposal facility.	There are no decommissioning activities in Greece.
Criteria for de-licensing a site	No information is available in the public domain.	Not applicable as no de-licensing is foreseen at the moment.	De-licensing is done on a case-by-case basis, but there are no exemption and clearance criteria in France.	The Radiation Protection Ordinance (RPO) of July 2001 defines clearance levels for de-licensing.	There are no decommissioning activities in Greece.
Regulation of discharges of radioactive materials in solid, liquid and gaseous phases	The Radiation Protection Act encompassing the EU BSS.	STUK Guide ST 6.2 of 1 July 1999.	A Government decree specifies the release authorisation.	Discharge of radioactive material is controlled by the Länder authority.	The GAEC authorises discharge under the Radiation Protection Regulation.
Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)	Government Decree of 30 January 1998.	STUK ST Guide complies with the European BSS.	There are no exemption and clearance levels and criteria in France.	The Radiation Protection Ordinance of July 2001 implements the European BSS.	The European BSS are followed in matters of exemption and clearance criteria.
Waste categorisation scheme	To a large extent the IAEA waste categorisation is followed.	A national waste categorisation scheme is followed (see Figure 5.8.1).	The IAEA waste categorisation scheme is primarily followed, but there is no exempt waste category in France.	The IAEA waste categorisation scheme is primarily followed, but there are minor variations.	It is not clear whether the country follows the IAEA waste categorisation scheme or not.
Waste disposal facilities within the country	The Paldiski site contains two partly decommissioned research reactors. The Sillamäe site contains uranium milling and mining waste. The Tammiku repository for LILW is now closed.	FPH and TVO have on-site interim storage facilities and cavern-type repositories for LILW.	The Centre de la Manche for LILW was closed in 1994. The Centre de l'Aube is in operation since 1993.	There is no operating waste disposal facility in the country. Spent fuels are stored on site.	An interim storage facility exists at the National Research Centre 'Demokritos'. Spent fuel from a research reactor is to be returned to the supplier.
Radiological protection principles and standards	The Radiation Act follows international best practice.	Section 2 of the Radiation Act meets the EC Directive 96/29/Euratom.	ASN draws on the expertise of DGSNR.	The BFS (Federal Office for Radiation Protection) implements on behalf of the BMU.	Same as the European BSS.
Implementation of EC Directive 96/29/Euratom of 13 May 1996 on the BSS	The Radiation Act implements the EC Directive.	The provisions have been implemented since 1999.	EC Directive 96/29/Euratom of 13 May 1996 on the BSS is followed.	The Radiation Protection Ordinance (RPO) of July 2001 implements the BSS.	Same as the European BSS.

<b>Issue</b>	<b>Estonia</b>	<b>Finland</b>	<b>France</b>	<b>Germany</b>	<b>Greece</b>
Regulatory body overseeing industrial safety	No information is available in the public domain.	Jointly by MTI, Energy Department, and Energy Management and Nuclear Energy Department.	No information is available.	The Federal Ministry for Labour and Social Affairs (BMAS).	No information is available.
Statutory regulation controlling industrial safety	No information is available in the public domain.	No information is available in the public domain.	No information is available.	Some of the important regulations are: * Occupational safety and health act; * Act of hazardous substances; * Ordinance for the safety of construction sites.	No information is available.

## Annex 2

### Overview of Decommissioning Regulatory Issues in Selected EU Member States (Contd.)

Issue	Hungary	Ireland	Italy	Latvia	Lithuania
Primary legislation under which a nuclear site licence is issued	Atomic Energy Act, CXVI, dated 10 December 1996 which came into force on 1 June 1997.	No legislation for issuing a site licence exists.	Law No. 1860 of 1962, amended by the Presidential Decree No. 519 of 1975. NPPs are governed by the Legislative Decree No. 230/95.	Act on Radiation Safety and Nuclear Safety of 26 October 2000.	The Law on Nuclear Energy (1996, No.1-1613, last amended 2004) and the Government Resolution No. 103.
National legislative/regulatory body empowered to issue a nuclear site licence	Hungarian Atomic Energy Authority (HAEA).	No regulatory body or licensing regime exists as there are no nuclear power plants or fuel cycle facilities in the country.	Ministry of Productive Activities (MAP) in consultation with APAT issues operational and decommissioning licences.	RDC under the Ministry of Environment is empowered to issue a licence. However, there are no nuclear power plants in Latvia.	The State Nuclear Power Industry Safety Inspectorate (VATESI) is empowered to issue a site licence.
Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety	The Nuclear Safety Directorate of the HAEA issues permits for commissioning, operation and decommissioning. Regional Protection Centres are responsible for radiation protection. Industrial safety is covered by the Ministry of Health, Social and Family Affairs.	RPPI under the Radiological Protection Act, 1991 has the responsibility on all matters of radiation safety. The EPA under the Environmental Protection Agency Act, 1992 is responsible for environmental licensing.	MAP issues licences for specific phases of decommissioning. APAT is responsible for nuclear safety and radiation protection. The Ministry of Environment is the environmental authority.	RDC is responsible for the radiological protection of the public and the environment. RAPA is responsible for shutdown reactor and disposal facilities. The Labour Safety Inspectorate is responsible for industrial safety.	VATESI is the nuclear safety regulatory body. The Ministry of Environment is responsible for environmental standards. The Ministry of Social Security and Labour is responsible for industrial safety.
National regulatory policy and/or Government policy for the decommissioning of nuclear facilities	No national policy for decommissioning exists.	Not applicable as there are no nuclear facilities in operation or undergoing decommissioning.	Under the Government policy to shutdown nuclear power plants, all plants have been shutdown and are now undergoing decommissioning.	The Government took the decision to shutdown the only research reactor (5 MWe IRT-type) and takes all major decisions.	No such policy exists.
Legal requirement for quality assurance in decommissioning	The Atomic Energy Act and the Government Decree 89/2005 (V.5) require a QA system.	Not applicable as there are no nuclear facilities undergoing decommissioning.	No statutory requirement for QA in decommissioning.	QA systems are being setup now.	The VATESI VD-KS-02-99 regulation applies. Also IAEA recommendations are followed.
National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on EIA for decommissioning	EC Directive 97/11/EC of 3 March 1997 on EIA on decommissioning is implemented under Decree No. 32/2001 of 14 February 2001.	The Office of Environmental Enforcement (OEE) of the EPA implements the EC Directive.	The Ministry of Environment uses the EC Directive directly with the advice of the EIA Commission.	The Law on Environmental Impact Assessment, Procedures for Strategic Environmental Impact Assessment and Procedures for Environmental Impact Assessment.	The Law on Environmental Impact Assessment of the Proposed Economic Activity (2000, last amended in 2005) implements the EC EIA.
National policy defining stages of decommissioning of nuclear installations	No such defined stages are available from the Nuclear Safety Directorate of the HAEA.	Not applicable as there are no decommissioning activities within the country.	Decommissioning is carried out under various phases, as defined in the decommissioning plan.	The IAEA decommissioning recommendations are followed.	The operator chooses on a case-by-case basis, which may not agree with the IAEA stages.
Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning	A multi-step licensing procedure is in place in Hungary.	Not applicable as there are no decommissioning activities within the country.	The licences are granted for specific phases of work by the MAP and regulated by the APAT.	The same operational licence is carried through for decommissioning. The standard length of licence validity is 3 years.	VATESI in consultation with the Ministry of Environment (RSC) issues the licence.
Strategy specifying the approach to decommissioning	No such strategy exists.	Not applicable as there are no decommissioning activities within the country.	Phases of decommissioning are dictated by the availability of a disposal facility.	The Government takes all major decisions for the only research reactor.	The immediate dismantling strategy in decommissioning is followed.

<b>Issue</b>	<b>Hungary</b>	<b>Ireland</b>	<b>Italy</b>	<b>Latvia</b>	<b>Lithuania</b>
Requirement for a Periodic Safety Report (PSR) as decommissioning progresses	A PSR is required for operation, but it is not clear whether it is needed for decommissioning.	Not applicable as there are no decommissioning activities within the country.	No requirement for a PSR.	A PSR is not a requirement, but regular progress reports to the RDC are required.	A PSR is not specified, but safety documentation is required.
Decay periods for radioactive materials within a particular stage of decommissioning	No information is available on this issue.	Not applicable as there are no decommissioning activities within the country.	No decay period is required, as the prompt decommissioning strategy is followed.	No defined decay period; a case-by-case evaluation is preferred.	No decay period is applicable.
Criteria for de-licensing a site	Not mentioned specifically in the Hungarian National Report, but exemption and clearance criteria are available.	Not applicable as there are no decommissioning activities within the country.	De-licensing requires compliance with clearance criteria.	De-licensing is achieved only after reaching the clearance level.	Primarily radiological protection (<10 µSv individual and <1 man.Sv collective dose for the critical group).
Regulation of discharges of radioactive materials in solid, liquid and gaseous phases	The Decree 15/2001 (VI.6) of the Minister of Environment is based on dose constraint.	The disposal of radioactive waste is regulated by the licence under Radiological Protection Act, 1991 (ionising Radiation) Order 2000.	No discharge authorisation from an operational plant is applicable. The discharge from decommissioning work is authorised by SOGIN.	'Regulations on Practices Involving Radioactive Waste and Related Materials' regulate discharges.	The Lithuanian document LAND 42-2001 applies. The Ministry of Environment issues discharge authorisations.
Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)	The European BSS is followed.	The European BSS is implemented.	National clearance criteria are followed.	'Regulations on Practices Involving Radioactive Waste and Related Materials' are the relevant regulations.	The Lithuanian Hygiene Standard HN:2001 incorporates the European BSS.
Waste categorisation scheme	Hungary follows its own waste categorisation scheme.	Ireland follows its own scheme – sealed or unsealed sources.	Technical Guide No. 26 is followed.	The IAEA waste categorisation scheme is followed.	The IAEA waste categorisation scheme is followed with some variation.
Waste disposal facilities within the country	No information is available.	There are no radioactive waste disposal facilities in Ireland.	No disposal facility exists at the moment.	A centralised waste storage/ treatment/disposal facility is at Baldone, operated by RAPA.	The Maisiagala radioactive waste facility was closed in 1989.
Radiological protection principles and standards	The IAEA BSS is followed.	RPII implements the European BSS.	APAT is responsible for the regulation and supervision of nuclear safety and radiation protection.	The IAEA BSS are followed.	The Radiation Protection Centre (RSC) of the Ministry of Health is responsible for radiation protection of workers and the public.
Implementation of EC Directive 96/29/Euratom of 13 May 1996 on the BSS	The EC Directive 96/29/Euratom of 13 May 1996 on the BSS is followed.	RPII implements the European BSS.	The Legislative Decree No. 241 of 2000 implements the BSS.	RDC under the 'Regulations on Protection against Ionising Radiation' carries out this task.	The Lithuanian Hygiene Standard is HN 73:2001 "Basic Standards of Radiation Protection".
Regulatory body overseeing industrial safety	The Ministry of Health, Social and Family Affairs.	The Health and Safety Authority (HSA) is responsible for health and safety at work.	No information is available.	The State Labour Inspectorate.	The Ministry of Social Security and Labour.
Statutory regulation controlling industrial safety	Statutory regulations are not known.	The Safety, Health and Welfare at Work Act, 1989.	No information is available.	The Labour Protection Law, Procedures for the Performance of Internal Supervision of the Working Environment, etc.	There are a number of regulations that apply.

## Annex 2

### Overview of Decommissioning Regulatory Issues in Selected EU Member States (Contd.)

Issue	Luxembourg	Netherlands	Poland	Portugal	Romania
Primary legislation under which a nuclear site licence is issued	The Law of 25 March 1964 specifies details of regulation of radiological protection and nuclear energy.	Nuclear Energy Act: Bulletin of Acts, Orders and Decrees, 82, 1963, as amended 2004.	The Atomic Act of 29 November 2000, superseding that of 10 April 1986. There are no nuclear power plants in Poland.	Decree Law No. 487 of 5 December is the primary legislation.	Law 111/1996 and its amendment, Law 193/2003.
National legislative/regulatory body empowered to issue a nuclear site licence	Site licensing is not applicable in Luxembourg as there has never been any nuclear power plant. However, a site licence is required for a waste storage facility.	The Directorate for Chemicals, Waste, Radiation Protection (SAS) of the Ministry of Housing, Spatial Planning and the Environment is the licensing authority.	The National Atomic Energy Agency (NAEA) under the Ministry of Environment.	DGGE of the Ministry for Economic Affairs and the IA of the Ministry of Urban Affairs, Territorial Planning and Environment are competent authorities.	The National Commission for Nuclear Activities Control (CNCAN) is the national regulatory body.
Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety	Decommissioning is non-existent. The Division of Radiation Protection within the Ministry of Health is the regulatory body for radiation protection and industrial safety.	SAS of the Ministry of Housing, Spatial Planning and the Environment is the regulatory body.	NAEA is the regulatory body covering all aspects of nuclear activities.	DPRSN is responsible for radiological protection, IA for environmental protection.	CNCAN is responsible for all aspects of nuclear safety in operation and decommissioning. The Ministry of Agriculture, Forests, Water and Environment is responsible for environment.
National regulatory policy and/or Government policy for the decommissioning of nuclear facilities	Decommissioning is non-existent.	The Government policy is to decommission as soon as possible. But implementation is based on a case-by-case basis.	No information is available in the public domain.	There are no decommissioning facilities in the country. The Minister for Economic Affairs formulates the nuclear policy.	No information is available in the public domain.
Legal requirement for quality assurance in decommissioning	No specific QA system is applicable.	The Dutch Nuclear Energy Act (Article 21.1).	No explicit requirement for a QA process.	There is no information available in the public domain.	No legal requirement for QA. CNCAN is responsible.
National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on EIA for decommissioning	Not applicable in Luxembourg.	EC Directive 97/11/EC of 3 March 1997 on EIA on decommissioning is implemented in the Environmental Protection Act (1979, as amended 2002).	No reference of compliance with the EIADR.	There is no statutory requirement for EIADR.	The EC Directive 97/11/EC of 3 March 1997 on EIA on decommissioning is implemented.
National policy defining stages of decommissioning of nuclear installations	Decommissioning is non-existent.	The operator identifies the stages on a case-by-case basis.	No information is available in the public domain.	Not applicable as there is no decommissioning activity in the country.	No information is available in the public domain.
Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning	Licences for radioactive waste facilities are required.	The Nuclear Energy Act (Section 15b) defines licence requirements.	A single licence covers all the stages of the lifetime of a nuclear installation.	Not applicable as there is no decommissioning activity in the country.	No information is available in the public domain.
Strategy specifying the approach to decommissioning	Decommissioning is non-existent.	There is no defined strategy.	No information is available in the public domain.	Not applicable as there is no decommissioning activity in the country.	No information is available in the public domain.
Requirement for a Periodic Safety Report (PSR) as decommissioning progresses	Decommissioning is non-existent.	There is no requirement for a PSR.	No information is available in the public domain.	Not applicable as there is no decommissioning activity in the country.	No information is available in the public domain.

<b>Issue</b>	<b>Luxembourg</b>	<b>Netherlands</b>	<b>Poland</b>	<b>Portugal</b>	<b>Romania</b>
Decay periods for radioactive materials within a particular stage of decommissioning	Decommissioning is non-existent.	There is no specified decay period.	No information is available in the public domain.	Not applicable as there is no decommissioning activity in the country.	No information is available in the public domain.
Criteria for de-licensing a site	Not applicable.	Criteria are not explicit in the Dutch National Report.	No information is available in the public domain.	Not applicable as there is no decommissioning activity in the country.	No information is available in the public domain.
Regulation of discharges of radioactive materials in solid, liquid and gaseous phases	The Regulation of 14 December 2000 is the relevant regulation.	The Solid waste is managed by COVRA. Liquid discharge by V&W and aerial discharge by LNV.	No specific discharge authorisation scheme is available.	Not applicable as there is no decommissioning activity in the country.	No information is available in the public domain.
Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)	The Regulation of 14 December 2000 enforces the European BSS.	National exemption and clearance criteria apply.	In matters of exemption and clearance, there is no explicit compliance with the European BSS, but compliance with the IAEA BSS.	The Ministry of Health under the DL 165/02 of 17, 2002 implements part of the EC Directive.	Exemption and clearance criteria are in keeping with the EC BSS.
Waste categorisation scheme	The IAEA waste categorisation scheme is followed, but a different waste disposal licence scheme is followed.	The Netherlands has its own categorisation scheme.	The IAEA waste categorisation scheme is not followed.	The European waste categorisation scheme is followed.	No information is available in the public domain.
Waste disposal facilities within the country	No waste disposal facility exists.	No disposal facility. The COVRA manages storage facilities.	No information is available in the public domain.	ITN at Sacavem is the interim storage facility for sealed and unsealed sources.	No information is available in the public domain.
Radiological protection principles and standards	The European BSS are applicable.	The EU Directive is implemented.	Compliance with the IAEA BSS.	The EU standards are followed.	The National Commission for Nuclear Activities Control (CNCAN).
Implementation of EC Directive 96/29/Euratom of 13 May 1996 on the BSS	The Regulation of 14 December 2000 is applicable.	The Nuclear Safety Service (KFD) of the Ministry of Housing, Spatial Planning and the Environment (VI: VROM Inspectorate) implements it.	The International BSS are followed and consequently the European BSS are inherently complied with.	The Ministry of Health implements the EC Directive.	The EC Directive on BSS is adopted by the Minister of Health and Family under Order No. 944 of 28 December 2001.
Regulatory body overseeing industrial safety	Division of Radiation Protection of the Ministry of Health.	The Ministry of Housing, Spatial Planning and the Environment.	No information is available in the public domain.	No information is available in the public domain.	No information is available in the public domain.
Statutory regulation controlling industrial safety	No information is available.	No information is available.	No information is available in the public domain.	No information is available in the public domain.	No information is available in the public domain.

## Annex 2

### Overview of Decommissioning Regulatory Issues in Selected EU Member States (Contd.)

Issue	Slovak Republic	Slovenia	Spain	Sweden	United Kingdom
Primary legislation under which a nuclear site licence is issued	The Original Act 50/1976 Coll. was replaced by Act No. 541/2004 Coll. ('Atomic Act').	The Act on Protection against Ionising Radiation and Nuclear Safety of 11 July 2002 (The 2002 Act).	The Nuclear Energy Law L 25/1964 and the Royal Decree as 'Nuclear Installations Regulations' issued in Dec 1999.	The Act on Nuclear Activities (SFS 1984:3).	The Nuclear Installations Act 1965 (as amended) (NIA 65).
National legislative/regulatory body empowered to issue a nuclear site licence	The Nuclear Regulatory Authority of the Slovak Republic (NRA SR) (ÚJD SR) is the regulatory/licensing body.	The Slovenian Nuclear Safety Administration (SNSA) under the Ministry of Environment, Spatial Planning and Energy.	The Ministry of Industry, Tourism and Trade issues licences on the basis of an assessment by the Nuclear Safety Council (CSN).	Precise legislation passed by the Parliament to issue nuclear site licences is not known.	The Health and Safety Executive (HSE)/ND/Nuclear Installations Inspectorate (NII) is responsible for nuclear site licences.
Legislative/regulatory bodies overseeing decommissioning of nuclear installations, radiological protection, environmental protection and industrial safety	ÚJD is responsible for safety of nuclear installations and radioactive waste management, the PHA for radiation protection and the National Labour Inspectorate for industrial safety.	The SNSA is responsible for nuclear safety, radiological protection and decommissioning activities. The ARAO is responsible for radioactive waste disposal.	The Ministry of Industry, Tourism and Trade for licences; the CSN for safety assessment; the Ministry of Environment for EIA. The ENRESA, set up under Royal Decree 1522/1884, in 1984 is responsible for decommissioning and waste management.	SKI is responsible for nuclear safety. SSI is responsible for radiation protection. Both SKI and SSI report to the Minister of the Environment. The Swedish Environmental Protection Agency and the Swedish Work Environment Authority are the relevant regulatory bodies.	The NDA under the DBERR is responsible for decommissioning of legacy nuclear sites. The HSE/ND under DEFRA is responsible for all issues of nuclear safety and security. The EA/SEPA under DEFRA are responsible for environmental protection.
National regulatory policy and/or Government policy for the decommissioning of nuclear facilities	The decommissioning policy is defined in Atomic Act 541/2004 Coll.	The national policy on decommissioning is to reduce risks as early as possible within the EU regulations.	A Royal Decree specifies the Government Policy.	No national policy on decommissioning is present.	Review of Radioactive Waste Management Policy – Final Conclusions, Cm 2919, 1995 specifies the national policy.
Legal requirement for quality assurance in decommissioning	The ÚJD regulation 56/2006 Coll. QA requirement.	The national QA system conforms with ISO 9000:2000 and the IAEA Safety Series No. 50-C/SG-Q.	A QA Manual is a requirement for a decommissioning licence.	QA requirements are defined by SKI and SSI.	Compliance with ISO 9001 and ISO 14001 are legal requirements.
National statutory requirement for the implementation of EC Directive 97/11/EC of 3 March 1997 on EIA for decommissioning	The EC Directive 97/11/EC of 3 March 1997 on EIA on decommissioning is implemented.	Information not available in the public domain.	Implemented by the Royal Legislative Decrees RLD 1306/1986 of 26 June and RLD 9/2000 of 7 Oct 2000 incorporating EU Directives.	Ordinance on Environmental Assessment, SFS 1998:905 implements the EIADR.	Under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999.
National policy defining stages of decommissioning of nuclear installations	There are no defined decommissioning stages.	Information not available in the public domain.	There are no defined stages of decommissioning.	SSI FS 2002:4 defines the activities during decommissioning.	There are no nationally defined stages of decommissioning.
Requirement for a separate licence, as distinct from an operational licence, to carry out decommissioning	There is a requirement for a separate licence for decommissioning work.	Information not available in the public domain.	There is no requirement for a separate licence for decommissioning work.	Although provision for a separate licence for D&D operations exists, the licence for nuclear activities continues.	The operational licence is carried through to decommissioning operations.
Strategy specifying the approach to decommissioning	The strategy is described in the safety documentation.	Information not available in the public domain.	Decommissioning and dismantling is to be initiated three years after shutdown following the removal of spent fuel.	SSI and SKI define the strategy on a case-by-case basis.	An outline strategy is given at the design stage and subsequently PSR and DP give further details.



<b>Issue</b>	<b>Slovak Republic</b>	<b>Slovenia</b>	<b>Spain</b>	<b>Sweden</b>	<b>United Kingdom</b>
Requirement for a Periodic Safety Report (PSR) as decommissioning progresses	Regulation 49/2006 Coll. requires a PSR for every 5 years.	A PSR is required.	Regular reporting (every year) on safety issues is required, although a PSR is not strictly required.	No formal PSR is required, but regular safety reports are needed.	A PSR as decommissioning progresses is considered as best practice.
Decay periods for radioactive materials within a particular stage of decommissioning	No decay period is specified.	Information not available in the public domain.	No specified decay period.	No defined decay periods exist. It depends on the selected strategy.	A decay period is based on case-by-case considerations.
Criteria for de-licensing a site	Based on the clearance criteria of the European BSS.	Information not available in the public domain.	The CSN defines criteria on a case-by-case basis and the Ministry of Industry, Tourism and Trade de-licenses the site.	No criteria have been established.	The criterion is based on 'there is no longer any danger from ionising radiation, generally dose < 10 $\mu\text{Sv}\cdot\text{y}^{-1}$ '.
Regulation of discharges of radioactive materials in solid, liquid and gaseous phases	The Government Decree 345/2006 Coll. implements the EU BSS.	A discharge authorisation is based on specific values of public exposure.	The CSN specifies discharge limits in order to comply with European guidelines and recommendations.	Discharges are regulated by SSI FS 2000:12.	The RSA, 1993 and the Environmental Protection Act, 1990 are the relevant regulations.
Exemption and clearance criteria as defined in the European Basic Safety Standards (BSS) (EC Directive 96/29/Euratom of 13 May 1996)	These criteria are adhered to.	Information not available in the public domain.	The European BSS are used as reference for exemption and clearance criteria.	Exemption criteria are as per European BSS, but clearance criteria are nationally defined.	Generally in agreement. The radiological criterion is 10 $\mu\text{Sv}/\text{y}$ .
Waste categorisation scheme	The IAEA waste categorisation scheme is mainly followed, but there are slight variations.	Information not available in the public domain.	Spain has its own categorisation scheme.	Based on waste acceptance criteria of the disposal facility.	The United Kingdom has its own waste categorisation scheme.
Waste disposal facilities within the country	The interim fuel storage facility for LILW is at Mochovce.	No waste disposal facility for SF, there is a storage facility at Krško NPP site for operational LILW.	El Cabril facility (Cordoba) for disposal of LILW.	Forsmark is the LILW repository. Oskarshamn, Ringhals and Studsvik sites are for low level wastes.	A low level waste disposal facility is at Drigg in Cumbria. No intermediate or high level waste disposal facilities are available.
Radiological protection principles and standards	The EC Directive 96/29/Euratom of 13 May 1996 on the BSS is followed.	The IAEA standards are followed.	Standards are in keeping with the European BSS.	Follows the European BSS.	The Ionising Radiations Regulations (IRR99) specify the principles and standards required by law.
Implementation of EC Directive 96/29/Euratom of 13 May 1996 on the BSS	The State Faculty Health Institute under the Ministry of Health (Act 126/2006, Decree 345/2006).	No evidence, but the IAEA Safety Standards Series No. 115 is followed.	The Royal Decree 1836/1999 of December 3 implements the European BSS.	The European BSS have been implemented.	The HSE/NII is the national regulatory body. EA and SEPA are the environmental agencies.
Regulatory body overseeing industrial safety	The National Labour Inspectorate under the Ministry of Labour, Social Affairs and Family.	Information not available in the public domain.	The Ministry of Labour and Social Affairs is responsible for industrial safety.	The Swedish Work Environment Authority.	The Health and Safety Executive (HSE) under the HSWA 74.
Statutory regulation controlling industrial safety	Act 124/2006, 125/2006, 479/2007 and several others.	Information not available in the public domain.	Law 54/2003 of December 12 on 'Legislative Framework Revision on Prevention of Labour Risks'.	The Swedish Work Environment Act, SFS 1977:1160 applies.	The Health and Safety at Work etc Act, 1974 and subsequent subservient legislation.

## **Annex 3**

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## **Annex 4**

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#### **Draft Report**

Rahman, Anisur, Nuvia Limited, Warrington, United Kingdom: 26 March 2008

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#### **Expert Review Meeting**

Warrington, United Kingdom: 28–29 April 2008

Organised by Nuvia Limited

#### **Revised Report**

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#### **Quality Review**

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