Luxembourg

National Report on the measures taken by Luxembourg to fulfill the obligations laid down in the:

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

2009

Table of Contents

Section A : Introduction

General introductory remarks

Luxembourg has signed the Joint Convention on 1st October 1997 and is a Party thereof since 19 November 2001. The Convention entered into force on 21 June 2001.

Luxembourg has no nuclear power plant, no other fuel-cycle facility, no research reactor and no other facility generating radioactive substances. Thus many requirements of the Joint Convention do not apply to Luxembourg. It further has no spent nuclear fuel and no high level radioactive waste on its territory.

There are other reasons which explain, why the actual total amount of radioactive waste, in form of disused sealed sources of low activity, is marginal:

- small size of the country;
- import license for a radioactive sealed source is only granted by the competent authority under the condition that the foreign supplier certifies taking back the disused radioactive source;
- import and installation of radioactive smoke detectors and of radioactive lightning conductors has been forbidden for many years;
- most of the old “historical” radioactive sealed sources have been returned to the country of origin or to a foreign waste management facility.

In Luxembourg radioactive wastes are only arising from the use of radioactive sources in industry, medicine and to a small 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, because not at all commensurate. Therefore all disused sealed sources have to be returned to the country of origin and if this turns out to be impossible, to a foreign waste management facility.

Since 1967, Luxembourg has a legislation and a regulation on radiation protection, which cover all relevant nuclear and radiological safety issues. This regulation is revised periodically in order to be in conformity with the provisions of the Directives of the European Union of which Luxembourg is a Member State. The last amendment of the regulation was put into force on 21 July 2006 with the transposition of the Council Directive 2003/122/Euratom of 22 December 2003

The legal framework relates to the protection of the general population, to the protection of workers and to the protection of the environment from damage that may be caused by radioactive sources or radioactive waste.

The aim of this report is to demonstrate that Luxembourg meets its obligations of the Joint Convention. This demonstration is mainly based on the Luxembourg legislation and policy framework concerning the management, the control and the inspection of radioactive sources and radioactive waste held in the country.

The report is structured in conformity with the "Guidelines regarding the form and structure of national reports" issued by the IAEA on 19 July 2006 (INFCIRC/604/Rev.1). The section concerning the safety of spent fuel management covering articles 4-10 of the Joint Convention are not applicable to Luxembourg.

The situation with regard to the obligations of the Convention has practically not changed since the previous Review Meeting. For this reason and with the objective to produce a stand-alone document many paragraphs have remained unchanged. New developments that have occurred since the last review meeting are clearly assigned throughout the document by underlining the first words of a sentence. Section H completely differs from the previous report, which is a result of the discussion during the last review meeting.

By the following the report includes a section addressing observations and comments to Luxembourg during the last review session in 2006.

Observations and comments from the 2nd review meeting

Short-term management of disused sources, including an active encouragement by the regulator to replace radioactive sources with non-radioactive alternatives, a legal requirement that disused sealed sources must be returned to the supplier and a special arrangement with Belgium for treatment and disposal of small quantities of radioactive wastes was seen as main highlights.

The national inventory operated by the regulator and tracking each radioactive source from the moment of importing up to its return to the supplier and the clear procedures, including financial provisions, for managing sources of unknown origin have been considered as a good practice.

Luxembourg was then asked to declare the national interim storage facility under the joint convention and to report on the safeguards calibration sources hold by EURATOM in Luxembourg. The present report addresses these challenges in section H and section E, respectively.

The planned measure to improve the control of shipments and transits of radioactive material and how they have been implemented over the past 3 years are highlighted in section I.

Section B: Policies and practices (Article 32.1)

Radioactive waste management policy

The Luxembourg policy of the radioactive waste management is dictated by the practical needs of the country. The low activity and volume of radioactive waste produced in the country are not justifying the implementation of a national final waste depository on the territory.

From the very beginning on (1967), the Luxembourg policy aimed to avoid the production of radioactive waste. This policy is mainly based on the following provisions:

- return of disused sealed sources to the foreign supplier;
- replacement of radioactive sources by non-radioactive alternatives if available;
- minimization of the production of waste by the user;
- storage of transition radioactive waste on the user's premises until decay;

This policy is translated into national legislation. Concerning the small quantities of radioactive waste arising in Luxembourg, the Belgian government has exceptionally, and due to the small quantities, accepted to treat the waste coming from the Grand Duchy of Luxembourg, in Belgium.

The following table gives an overview over the national radioactive waste management policy according to the matrix introduced during of the last review meeting.

Type of Liability	Long-term management policy	Funding of Liabilities	Current practice / facilities	Planned facilities
Non-power wastes	• Export to Belgium	• Licensee • State budget	• Decay • Interim storage	• None
Disused Sealed Sources	• Return to supplier • Export to Belgium	• Licensee • State budget	• Interim storage • Return to supplier • Export to Belgium	• None

Radioactive waste management practices

As defined by legislation all facilities using radioactive substances exceeding the exemption levels must be licensed in advance by the competent authority, according to the licensing system as reported under Article 19. Theses facilities are fully responsible for the safety and the security of the radioactive sources they use and for the management of the radioactive waste resulting from this use.

Radioactive waste is classified by the half-life of the corresponding nuclides and whether the disused sources are sealed or unsealed. A classification system as recommended by the European Commission (Commission Recommendation 1999/669/EC, Euratom) is not used, as it presents no practical advantage for Luxembourg.

Luxembourg further implemented the clearance levels for unconditional release as recommended by the German "Strahlenschutzkommission" (Commission on Radiological Protection) in the document "Clearance of Materials, Buildings and Sites with Negligible Radioactivity from Practices subject to Reporting or Authorisation" published 1998.

Management practices of the different types of wastes, namely disused sealed sources, unsealed sources and wastes from non-authorized practices are separately reported on in the following paragraphs.

Management of disused sealed sources

All radioactive sealed sources have to be imported from other countries, mainly from other European member States. In line with the regulation in force, each import and installation of a sealed source is submitted to a licensing procedure. As part of this licensing procedure, the applicant must have a written commitment from the foreign supplier, where the latter agrees to take back the source if disused. If it turns out that the supplier is unable to respect his commitment, e.g. in case of bankruptcy, the user or holder is obliged to take all necessary administrative steps to send his disused source to any other supplier of radioactive sources or foreign waste management facility. This also applies to older sources not yet covered by these new regulatory provisions. Before the shipment is scheduled is sources are stored on the users premises. A list of all these sources is given in annex I.

Management of wastes from unsealed sources

Unsealed sources are only used in nuclear medicine, radiotherapy or in biomedical laboratories, e.g. Ga-67, Sr-89, Y-90, Tc-99m, I-125, I-131, Gd-153, etc. Several research laboratories, mainly in the field of biomedical research also use small quantities of H-3, C-14, P-32, S-35 and I-125. The license, authorizing these practices, specifies the procedures for adequately handling, controlling and minimizing the releases of these radioactive substances.

Waste resulting from these practices and containing short-lived radionuclides are stored on the user's premises until decay or until the activity of the waste decreased below the clearance levels as fixed by regulation for the unconditional release. Wastes containing small specific activities below clearance level and not exceeding a total weight of 1000 kg may be treated the same way as conventional hospital waste. Clearance of very low activity wastes above these levels has to be licensed by the Minister of Health.

With the objective of minimizing releases, the national iodine-131 therapy center is equipped since mid of 2005 with a special retention system for all wastewaters from this department. It consists of three different tanks, each one capable to store up to 6 months of wastewater. These waters can only be released after taking a sample and measuring its remaining activity in the laboratory of the DRP.

Concerning liquid radioactive substances with longer half-lives, such as C-14 and H-3, most licensees work with almost marginal activities. Thus the resulting liquid wastes and contaminated solid wastes remain below the clearance levels. However a hospital has over the last years collected all liquid wastes from tritiated thymidine. The specific activity is about a

factor of 15 above the clearance levels for unconditioned release and 180 liters with a total activity below 2 GBq have been accumulated. The licensee has entered into consultation process with the DRP, in order to find a best possible solution to evacuate these wastes.

Management of orphan sources

All steel an aluminum recycling plants are equipped with fixed portal monitoring systems to detect radioactive materials inside vehicles transporting scrap by road or by rail. In all cases these portal monitors consist of two large plastic scintillation detectors. On the only harbor in Luxembourg a commercially available crane monitoring system is used for the unloading of scrap from ships.

End of 2007 the national waste recycling plant installed portal monitoring systems at the entrance to its site.

All operators of detection gates have worked out clear procedures together with the DRP for adequately reacting when radioactive substances are detected. Agreements exist with Belgium and with France for the return of the truck or the train under certain conditions and following defined procedures. In all other cases the load has to be separated in Luxembourg. The radioactive sources are then either returned immediately or stored in Luxembourg until a safe return to the country of origin can be organized. A specialized company from Germany generally performs the separation.

Either the operator of the monitoring systems or the responsible supplier has to cover the costs for the safe management of these orphan sources. If this turns out to be impossible, a specially labeled credit of the state budget covers all associated costs.

Since January 2006, the regulatory body has been informed of 10 alerts in the steel recycling plants, 5 in the aluminum industry and 4 at the waste recycling plant. In one of these cases it turned out to be a false alarm, NORM was detected 14 times and in 4 cases artificial radioactive sources were separated.

Management of disused consumer goods containing small amounts of radioactive substances

To minimize radioactive waste produced in Luxembourg, the use and installation of the below listed goods containing radioactive substances has consequently been prohibited over the years:

- The installation of new ionizing chamber smoke detectors (ICSD) has been prohibited in 1994.
- In 1995, the DRP has started a program to withdraw all radioactive lightning conductors in use. These radioactive lightning conductors were installed in the 60s and 70s without the required licenses. The DRP again contacted early 2008 all responsible actors to encourage the removal of the remaining 5 lightning conductors.
- The production and import of thorium incandescent gas mantles are forbidden, since gas mantles without any radioactive substances are available with similar properties.
- Consumer goods as watches, compasses, fishing floats, etc, containing radio-luminescent paintings or other consumer goods containing radioactive substances, as technical porcelain, optical glasses are collected by the DRP.

The waste arising from these products is either returned to the supplier or collected at the national interim waste storage for being shipped to a foreign waste management facility.

Section C: Scope of application (Article 3)

The present report applies to the safety of the management of radioactive waste resulting from civilian applications and containing artificial radionuclide exceeding the regulatory clearance levels for the unconditional release.

The present report also applies to waste that contains naturally occurring substances exceeding the regulatory clearance levels for the unconditional release. It does not apply to waste that contains naturally occurring substances that, at the time of production, were not considered by law as radioactive waste.

As Luxembourg has no nuclear fuel cycle, the present report does not apply to the safety of spent fuel management.

Section D: Inventories and lists (Article 32.2)

The inventories of the radioactive wastes stored on 1 September 2008 at the national radioactive waste interim storage facility and on the user's premises are listed in Annex I.

The relevant regulation further attributes the responsibility to the DRP for maintaining a national database of all radioactive sources above exemption level. This includes radioactive wastes. Licensees have to notify the DRP of any modification of their inventory. The database contains information about the type, activity and registration number of the source its localization and a reference to the corresponding license.

Section E: Legislative and regulatory system

Article 18: Implementing measures

In 1963, a framework law was enacted on the Protection of the Public Against the Hazards of Ionizing Radiation, which established general principles and attributes competence to the Minister of Health.

The law of 21 November 1980 concerning the organization of the Directorate of Health (DS) defines a department of radiation protection (DRP), charged with questions concerning the protection against hazards of ionizing and non-ionizing radiation, as well as nuclear safety.

These principles formed the basis for executive regulations, which were regularly amended in conformity with the EU directives on radiation protection and to govern the various aspects of nuclear safety. The current regulation implements Council Directive 96/29/Euratom of 13 May 1996 laying down basic standards for the health protection of the general public and workers against the dangers of ionizing radiation. The last amendment of

the regulation was put into force on 21 July 2006 with the transposition of the Council Directive 2003/122/Euratom of 22 December 2003.

The current regulations apply 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. They also apply to the treatment, handling, storage, elimination and disposal of radioactive substances or waste and to any other activity involving a risk arising from ionizing radiation.

The various laws and regulations, building a solid legal framework, are listed in Annex II.

Article 19: Legislative and regulatory framework

Radiation Protection

The provisions relating to dose limits for the public and workers take into consideration the ALARA principle (As Low As Reasonably Achievable). Thus, the exposure of the public and workers to ionizing radiation and the number of persons and workers exposed to radiation must be kept as low as reasonably possible.

The limit of the annual effective dose for exposed workers (including women of child-bearing age, apprentices and adult students) is fixed to 10 mSv. The working conditions for pregnant women have to guarantee, that the equivalent dose to the unborn child will not exceed 1 mSv. Nursing women are not allowed to work in conditions bearing high risks of contamination. For apprentices and students aged between 16 and 18 years who are obliged to use radioactive sources, the annual effective dose is fixed to 3 mSv. For members of the public and for apprentices and students below the age of 16 years, the maximum annual effective dose is fixed to 1 mSv.

The current regulation describes the operational rules to protect workers, outside workers, apprentices and students exposed to radiation. In particular, working areas are divided into “controlled areas” and “supervised areas” and workers are categorized. The regulations further impose a certain number of obligations, including the implementation of radiological monitoring of workers and workplace, as well as medical supervision, procedures regulating access to different areas, appropriate information of workers and training in the field of radiation protection.

The system of licensing and prohibition

Facilities are ranged in four different categories:

- 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.

- In Category III are ranged all 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.
- In category IV are classified all 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, issued by the Government in Council (category I), the Minister of Health (category II) and the Health Directorate (categories III) is required for categories I-III. Declaration to the DRP is sufficient for category IV. The Minister of Health may suspend or withdraw a license when the licensee contravenes the regulation in force or the conditions of the license. Radioactive releases above clearance levels are submitted to prior licensing by the Minister of Health.

Control, enforcement and responsibilities

Licensed facilities are monitored and inspected at regular intervals by inspectors of the DRP. Theses periodic inspections focus on the radiological protection of the workers and the physical protection of the radioactive substances. The licensee has to demonstrate that internal procedures concerning the management of radioactive substances exist, are adequate and correctly applied.

The inspectors of the DRP are enabled to impose appropriate measures to in order to avoid potential incidents or accidents with implications on workers, public and environment. Agents of the DRP are further attributed with the legal power of police officers. In 2007, Inspections were conducted at least once in all nuclear medicine and radiotherapy centers, in 15 of the 28 industrial facilities licensed to use radioactive sources and in one of the 7 research laboratories working with radioactive substances. No significant irregularities were revealed during these inspections. Nevertheless, one industrial licensee reported the loss of a Kr-85 source in 2007.

Following an Irish initiative the DRP has started end of 2007 an inter-comparison of the regulatory activities with focus on the implementation of Council Directive 96/29/Euratom with the Radiological Protection Institute of Ireland. This valuable process between both regulatory bodies is expected to be finalized end of 2008.

Regulatory approach with regard to EURATOM

At the second review meeting, Luxembourg was asked to include the EURATOM safeguards calibration sources in the following national report. Luxembourg's legislative and regulatory framework applies in the same way to EURATOM than to any other user of radioactive substances. Thus the general regulatory overview that had been reported on during the second review meeting covered all licensees in Luxembourg, including EURATOM.

In order to correctly address the challenges the following gives a regulatory overview on the example of EURATOM:

In January 2001, representatives of the European Commission contacted the DRP in order to prepare for the licensing procedure. During the following two and a half years, an independent safety assessment had been conducted by a French Institute (IRSN), followed by more than 10 formal exchanges between the Commission and the DRP.

1) Licensing procedure

1st October 2003:	*The Commission's Directorate-General for Energy and Transport (DG-TREN) introduces a complete application for a license, including a description of the activities, a procedure on the elimination of the waste waters from the laboratory, a safety report (identification of principle risks, evaluation of radiological consequences, probabilistic analyze of an airplane crash, technical measures) and an emergency plan;*
15 October 2003:	*Opinion of the Labor Inspectorate (Inspection du travail et des mines)*
24 November 2003:	*Opinion of the City of Luxembourg, based on public consultation.*
16 December 2003:	*Delivery of the "Class II" license by the Minister of Health for storing and using low-activity sealed radioactive sources with defined activity limits per nuclide.*

2) Internal procedures by the licensee

The license contains conditions, such as the obligation to implement a series of internal written procedures on the following issues:

- *Access control to locations where radioactive sources are stored and used.*
- *Handling of radioactive sources, including regular leak-testing.*
- *Management and storage of radioactive substances (inventories, record keeping, transfer licensing, notifications to DRP, declarations to the IAEA of safeguards relevant sources)*
- *Dosimetric monitoring and designation of a radiation protection officer (Responsable du contrôle physique).*
- *Management of waste and discharges (examples: release after control of the waste waters in the retention storages, control and exchange of the HEPA filters)*
- *Management of incidents and accidents*

3) Past, current and planned activities

After reception by inspectors of the DRP in January 2005, all radioactive sources hold by DG-TREN were transferred to the new installation. The former storage location was then formally decommissioned in January 2007 and liberated for other uses. Regular contacts between the designed radiation protection officer and the DRP, have permitted to ensure a high level of radiation and physical protection. Present projects are:

- *reduce of the radioactive substances inventory and modify the license accordingly.*
- *update of the procedure on "Management of waste and discharges", particularly with regard to potential contaminations on equipment used during inspections in nuclear installations, respectively contaminated waste waters in the retention tanks.*
- *certification according to ISO 17025 is under preparation.*

Article 20: Regulatory body

The legislative and executive competence in the field of radiological safety and radiation protection is attributed to the Minister of Health. The Minister of Health is responsible for enforcing radiation protection legislation. The DRP, placed under the authority of the Health Directorate of the Ministry of Health, is the designated regulatory body. Similarly to a number of other small countries, the DRP centralizes as a single department all expertise of radiation safety.

All activities and projects of the DRP are financed via state budget, allocating predefined credits on a yearly basis. Some of these credits are non-limited to allow covering important non-predicable costs. This applies for example to expenses from accidents and incidents, and also to the management of radioactive waste at the national radioactive waste interim storage.

The DRP is composed of 7 agents of higher education, specialized in radiation protection (1), medical physics (2), nuclear engineering (1), geology (1), biology (1) and chemistry (1). For regulatory purposes, they rely on the lawyers of the Ministry of Health. One technical engineer, 2 technicians, 2 laboratory assistances and one secretary complete the department.

Section F: Other general safety provisions

Article 21: Responsibilities of the license holder

According to grand-ducal regulation of 14 December 2000 concerning the protection of the population against the dangers arising from ionizing radiation, the license holder is fully responsible for the respect of all regulatory provisions.

Article 22: Human and financial resources

By legislation, facilities using or holding radioactive sources or radioactive waste are bound to provide adequate human and financial resources to guarantee the safety and security of their sources and waste.

All licensees have to designate a qualified radiation protection officer who is responsible to implement the obligations of the licensee. They must further contract a special insurance covering the reparation of radiological damage to third persons in case of an accident.

Since the transposition of the Council Directive 2003/122/Euratom in 2006, holders of high activity sources have to conclude a contract with the supplier, where the latter agrees to take back the source after use, even when the licensee is unable to cover the associated costs.

Article 23: Quality assurance

The designated radiation protection officer is responsible to establish and implement a quality assurance program with regard to the implementation of internal procedures, such as regular verifications and calibrations of the used radiation measurement equipment.

Article 24: Operational radiation protection

The licensee is fully responsible to implement internal radiation protection following the principles described under article 19 and the control of actual or potential discharges according to the national policies described under section B.

Article 25: Emergency preparedness

As facilities are fully responsible for the safety of their radioactive sources and waste, they have to take the necessary steps to cope with radiological emergencies. Depending of the quantities of radioactive substances, they have to draw up internal emergency response plans taking into account the most probable accidents. Periodic review of the plans and training of the staff by organizing regular exercises are part of the conditions set in the license.

In case of an emergency, the license holder is obliged to notify immediately DRP, ASS and ITM to evaluate the possible radiological consequences for the populations at risk, to take the necessary steps to avoid or to stop the release of radioactivity in the environment and limiting by that the exposure of individuals and to respect the legal provisions in case of emergency exposures.

The Government has set up a national emergency response plan to alert and to protect the population in case of a radiological emergency. The Minister of Health and the Minister of Interior are responsible for the off-site emergency planning. The plan is activated and regularly tested by the DRP and by the ASS, in national, bilateral and international exercises. Emergency teams have been formed to assist in the event of a nuclear disaster, and refresher courses are held periodically.

Bilateral agreements on mutual assistance have been concluded with Germany, France and Belgium. These general agreements also cover radiological and nuclear emergencies. A bilateral agreement on mutual early information has been concluded with France and Belgium.

Article 26: Decommissioning

Prior to licensing all users of high activity sources have to introduce a safety report. This report includes precautions for avoiding accidents and provisions for the management of incidents and accidents, such as potential contaminations necessitating cleanup and decommissioning. These reports are regularly up-dated by the licensee and submitted to all involved actors, including the DRP.

Section H: Safety of Radioactive Waste Management

Article 11: General safety requirements

As highlighted in section B only marginal amounts of radioactive wastes exist in Luxembourg and effective measures are in place to keep their amounts and the duration of interim storage very low. Thus many provisions of article 11 do not apply. Facilities that store such radioactive wastes have to comply with the safety provisions of category II facilities.

Article 12: Existing facilities and past practices

The radioactive wastes resulting from practices highlighted in section B and for which exist no license holder are collected by the DRP for a short interim storage at the national radioactive waste interim storage facility, operated and controlled by that department and situated at the CHL, 4, rue Barblé, Luxembourg. A detailed inventory of all the radioactive waste presently stored at this location is given in annex I.

At regular intervals, the Belgian Waste Management Agency (ONDRAF/NIRAS) picks up this radioactive waste in Luxembourg and transfers it to the Belgian storage facility.

Articles 13, 14 and 15: Siting, design, construction and assessment

Any hypothetic project to build a radioactive waste management facility or a facility for the final disposal of radioactive waste is subject to prior authorization by the Government in council according to the procedures defined for category I facilities. Each applicant would have to demonstrate full compliance with articles 13, 14 and 15.

Article 16: Operation of facilities

As stated under article 12, Luxembourg only operates a single waste interim storage facility. The wastes are segregated according to the acceptance criteria established by the Belgian Waste Management Agency (ONDRAF/NIRAS). In order to guarantee a safe storage, the DRP regularly asks the Belgian authorized inspection organization AV Controlatom for segregation and packing of the collected wastes.

The inspectors of the DRP further verify radiation level within the storage room and absence of radioactive contamination on a yearly bases.

Article 17: Institutional measures after closure

The interim storage facility will not be contaminated. Thus no specific measures, except of a final contamination verification will be needed after closure.

Section I: Transboundary Movement (Article 27)

In Luxembourg, transport of radioactive material is under control of the competent authorities. The provisions of the ADR (European Agreement Concerning the International Carriage of Dangerous Goods by Roads) and of RID (Regulation Concerning the International Carriage of Dangerous Goods by Rail) apply. Also the technical instructions of the ICAO and the Dangerous Goods Regulations of the International Air Transport Association (IATA) are applicable.

Only licensed carriers are allowed to transport radioactive materials in quantities above exemption level. The authorization may be limited to a single transport operation or valid for a limited period of five years at maximum.

For the transfer of radioactive sources, the EU Council Regulation of 8 June 1993 on shipments of radioactive substances between Member States is applicable. The transfer of

radioactive waste is regulated by the grand-ducal regulation of 16 April 1994 concerning transboundary shipments of radioactive wastes. This regulation is presently amended in order to transpose Council Directive 2006/117/EURATOM of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel.

Since the last amendment on 21 July 2006 of the grand-ducal regulation of 14 December 2000 concerning the protection of the population against the dangers arising from ionizing radiation, transits of radiation sources through Luxembourg have to be prior notified to the DRP. All these information of transfers, imports, exports and transits are collected by the DRP and entered to a database.

Luxembourg further wrote in 2007 to the Director General that it fully supports and endorses the IAEA's efforts to enhance the safety and security of radioactive sources, and applies the guidance on the Import and Export of Radioactive Sources contained in the IAEA Code of Conduct on the Safety and Security of Radioactive Sources.

Section J: Disused sealed sources

Practices and policies with regard to disused sealed sources are reported in sections B, under radioactive waste management practices.

Section K: Planned activities to improve safety

Given the size of the country, Luxembourg does not know significant modifications from review meeting to review meeting. However Luxembourg is determined to constantly consolidate, up-date and improve its dispositions with regard to safety of radioactive substances. This is a constant process. Planned activities are as follows:

- Updating of the information to the public concerning regulatory procedures on the new homepage of the Ministry of Health (2008)
- Transposition of Council Directive 2006/117/EURATOM of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel (End of 2008).
- Using the questionnaires set by IAEA-TECDOC-1526 "Inspection of Radiation Sources and Regulatory Enforcement" during inspections (from 2009 on).
- Accreditation according to ISO 17025 of the Laboratory of the DRP (2011).

Annex I - Inventory

Interim storage of radioactive waste stored on 1st September 2008 on the users premises. Very short-lived radioisotopes are not taken into account:

Radionuclide	Physical state	Volume	Total activity (GBq)
H-3	Liquid	180 Liters	< 2 GBq

Inventory of disused radioactive sealed sources stored on 1st September 2008 on the users premises.

Radionuclide	Number of sources	Total activity (GBq)
Am-241	11	283
Kr-85	8	16.65
Sr-90	2	1.48
Co-60	1	0.05
H-3	1	7.4
Cs-137	4	2.27
Total:	**25**	**306.48**

Inventory of disused radioactive sealed sources stored on 1st September 2008 on the authority's premises. Divers radioactive salts and minerals containing NORM are not included.

Source type	Radionuclide	Number of sources	Total activity (GBq)
Lightening conductors	Am-241	60	0.67
Lightening conductors	Ra-226	8	0.25
ICSD's	Am-241	3229	0.91
ICSD's	Ra-226	884	0.024
Gaseous light sources	H-3	3	486
Industrial sources	Ni-63	3	1.036
Calibration sources	C-14	10	0.002
Calibration sources	Co-60	7	0.007
Calibration sources	Sr-90	8	1.184
Demonstration source	Ra-226/Be	1	0.111

Annex II - Legislative

Law of 25 March 1963 concerning the protection of the population against the dangers arising from ionizing radiation.

Law of 21 November 1980 concerning the organization of the Directorate of Health.

Law of 28 March 1984 concerning the approbation of the agreement between the government of the Grand Duchy of Luxembourg and the government of the French Republic concerning the information exchange in case of an incident or accident which might have radiological consequences, signed in Luxembourg on 11 April 1983.

Law of 11 april 1995 concerning the approbation of the Convention on the Physical Protection of Nuclear Material, opened for signature in Vienna and New York on 3 march 1980.

Law of 19 March 1997 concerning the approbation of the Convention on Nuclear Safety, adopted in Vienna on 20 September 1994.

Law of 28 July 2000 concerning the approbation of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, adopted in Vienna on 26 September 1986.

Law of 28 July 2000 concerning the approbation of the Convention on Early Notification of a Nuclear Accident, adopted in Vienna on 26 September 1986.

Law of 20 june 2001 concerning the approbation of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management, adopted in Vienna on 5 September 1997.

Law of 27 April 2006 concerning the approbation of the agreement between the government of the Grand Duchy of Luxembourg and the government of the Kingdom of Belgium concerning the information exchange in case of an incident or accident which might have radiological consequences, signed in Eischen on 28 April 2004.

Grand-ducal regulation of 27 November 1987 concerning the admissible levels of radioactivity in foodstuffs.

93/1493/EURATOM - Regulation of 8 June 1993 on shipments of radioactive substances between Member States.

Grand-ducal regulation of 16 April 1994 concerning transboundary shipments of radioactive wastes.

Grand-ducal regulation of 11 August 1996 concerning the provision of information to the population on the applicable measures for the protection of public health and on the conduct to be adopted in the event of a radiological emergency.

Grand-ducal regulation of 14 December 2000 concerning the protection of the population against the dangers arising from ionizing radiation, as modified on 21 July 2006.

National emergency response plan in case of an incident or accident in the nuclear power plant of Cattenom or in case of any other radiological or nuclear event. (December 1994).

Annex III - GLOSSARY OF ABBREVIATIONS

ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Roads
ALARA	As low as reasonably achievable
ASS	Administration des Services de Secours (Rescue Services Agency)
DG-TREN	Directorate-General for Energy and Transport of the European Commission
DRP	Division de la Radioprotection (Department of Radiation Protection)
DS	Direction de la Santé (Directorate of Health)
EU	European Union
HEPA	High Efficiency Particulate Arresting (Filters)
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICSD	Ionizing chamber smoke detector
IAEA	International Atomic Energy Agency
ITM	Inspection du travail et des mines (Labor inspectorate)
MS	Ministère de la Santé (Ministry of Health)
NORM	Naturally Occurring Radioactive Materials
RID	Regulation Concerning the International Carriage of Dangerous Goods by Rail