Luxembourg

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

"CONVENTION ON NUCLEAR SAFETY"

to the

Sixth review meeting of the contracting parties in 2017

This report was produced by the Department of Radiation Protection (DRP) on behalf of the Government of Luxembourg

List of Acronyms and Abbreviations

ASS	Rescue Services Agency
AFCN	Belgian Nuclear Safety Authority
CC	Crisis Centre
CIC	Communication and Information Cell
CNS	Convention on Nuclear Safety
CONVEX	Convention Exercises (Emergency drills and exercises in the frame of the Convention on Early Notification of a Nuclear Accident)
CORDIRPA	French working group on the management of a post accidental phase
CSPN	High Level Council of National Protection
DRP	Department of Radiation Protection within the Directorate of Health (Regulatory Body)
ENSREG	European Nuclear Safety Regulators Group
ENSTTI	European Nuclear Safety Training and Tutoring Institute
EP&R	Emergency Preparedness and Response
EPZ	Emergency Planning Zone
EU	European Union
EU-BSS	COUNCIL DIRECTIVE 2013/59/EURATOM of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom.
EU-NSD	COUNCIL DIRECTIVE 2014/87/EURATOM of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations.
HCPN	High Commission of National Protection
HERCA	Heads of the European Radiological protection Competent Authorities
HWA	HERCA-WENRA Approach
IAEA	International Atomic Energy Agency
INEX	International Nuclear Emergency Exercises
IRSN	Institute for Radiation Protection and Nuclear Safety in France
JINEX	Joined International Nuclear Emergency Exercises
NEA	Nuclear Energy Agency
MFA	Ministry of Foreign Affairs
NPP	Nuclear Power Plant
OECD	Organization for Economic Co-operation and Development

REC	Radiological Evaluation Cell
RPO	Radiation Protection Officer
SELCA	System of Exchanges and Liaison between Cattenom and the public Authorities
SIP	Public relations office of the government
VDNS	Vienna Declaration on Nuclear Safety
WENRA	Western European Nuclear Regulators Association
WGET	Working Group on Effectiveness and Transparency

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A – Introduction

Luxembourg signed the Convention on Nuclear Safety (CNS) on 20 September 1994. It entered into force on 6 July 1997 by ratification. Luxembourg actively participated in all 6 previous review meetings of the contracting parties.

No nuclear power plant, no other fuel-cycle facility, no research reactor and no other nuclear facility is operated or planned in Luxembourg. In its immediate vicinity, at only 8.5 km south from the national border EDF operates the French NPP "Cattenom" comprising four 1300-MWe reactors. A second French site, Chooz with two times 1450 MWe output is located at around 70 km west from Luxembourg and the three reactors (3 x 930 MWe) at Tihange in Belgium have a distance of 65 km north-west from the closest border point. The closest German NPPs, Biblis (shutdown since March 2011 under the German phase-out policy) and Philipsburg, are situated at around 150 km east of Luxembourg. Other operating NPPs, like Doel (Belgium), Fessenheim and Nogent-sur-Seine (France), Borsele (Netherlands) and Neckarwestheim (Germany) are at distances between 150 and 250 km.

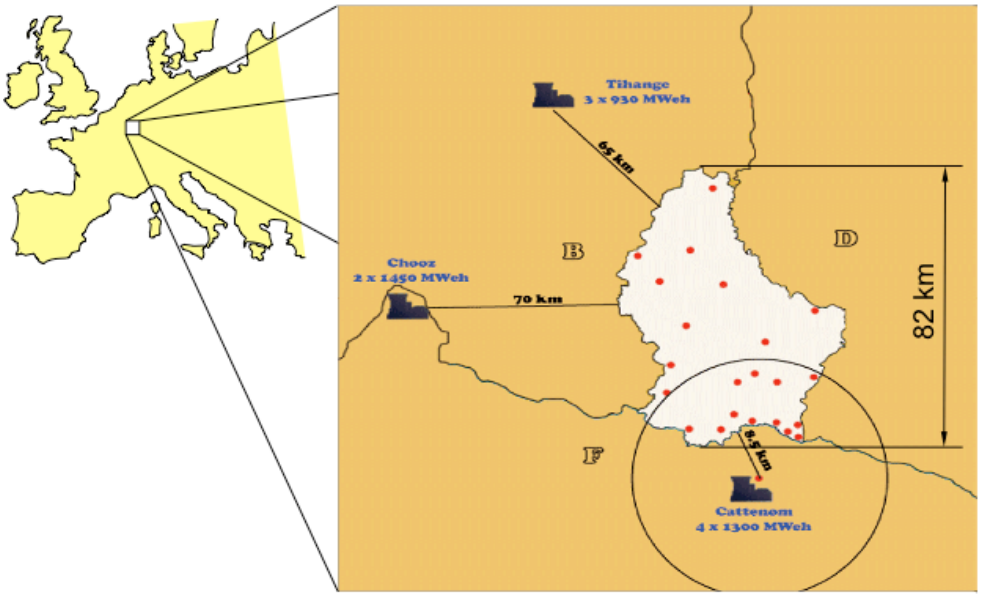

Figure 1: *Situation of Luxembourg. The image indicates the location of the 3 closest NPP's in France and Belgium, respectively. The red dots on the map show locations where automatic radiation monitoring stations are installed.*

Since the late 70s, the public perception of nuclear power has been very critical. All succeeding governments have declared their critical attitude towards nuclear energy. The accident in Fukushima Dai-ichi in 2011 has initiated a more intensive debate at political level and the government has clearly positioned itself against the use nuclear power.

The department of radiation protection (DRP) represents Luxembourg at the review meetings. Luxembourg considers the CNS pair review as a highly valuable exercise. It allows for a small country with limited nuclear expertise to gain insight to relevant safety issues in other countries. Besides the aspect of being reviewed, having frank and open discussions with qualified experts while profiting from constructive "nearly cost-free" advice is extremely useful.

The present National Reports has been produced by the DRP as a process of self-assessment of the implementation of the obligations under the Convention with focus on the challenges to be addressed and the follow-up action taken since the last Review Meeting. The report is a stand-alone document, structured in conformity with the "Guidelines regarding National Reports under the Convention on Nuclear Safety" (INFCIRC/572/Rev.5). Since this report is not so different compared to the last national report, new paragraphs or sentences are clearly marked through the report. Only the introduction, the summary and most paragraphs under article 16 have been completely revised.

Out of the 5 challenges, identified by the Special Rapporteur of the 6th Review Meeting for consideration by Contracting Parties, the present report particularly focuses on how to achieve harmonized emergency plans and response measures. The report addresses the other identified challenges as applicable, particularly international peer review services, regulators' independence, transparency and openness as well as international cooperation. This includes reporting on the lessons learned, as applicable, from the Fukushima Daiichi Accident and lessons in the IAEA Director General's Report on the Fukushima Daiichi accident. Those issues, together with the response to the challenges from the 6th Review Meeting will be highlighted in the summary.

The objectives of the Vienna Declaration on Nuclear Safety (VDNS) aim at reinforcing the prevention of accidents and the mitigation of its consequences. Luxembourg considers that the spirit of the VDNS may include the mitigation of consequences off-site. The present report therefor highlights EP&R arrangements in more depth. This concerns particularly the efforts done to set up and implement a new emergency response plan in case of a nuclear accident.

Luxembourg is in favor for the development of templates for each article as it had been proposed at the 2nd extraordinary meeting (Action 1.2 of the WGET). So far these templates only exist for articles 17 and 18 that are not applicable to Luxembourg.

The management of radioactive waste is addressed in the national report to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. From Article 19 (viii) of the CNS results no obligation for Luxembourg.

Since there is no nuclear installation planned or in operation in Luxembourg, only Articles 7, 8 and 16 are applicable. As part of the commitment to the principles of the CNS, the present report will also present information on activities covered by Articles 9, 10 and 15.

The resent report along with the questions and comments received during the review process will be published on the webpage of the DRP "www.radioprotection.lu" before the Review Meeting will start.

B – Summary

Achieve harmonized emergency plans and response measures.

The French NPP Cattenom being 8.5 km from the border of Luxembourg and 2 German Federal States at similar distances (12 and 15) from that plant, Belgium being at 25 km, a harmonized response in case of an accident is vital, but at the same time very challenging to achieve.

Since harmonization of emergency preparedness arrangements seem not to be possible, Luxembourg has taken the position that an alternative mechanism should be developed to enable at least an alignment of the response in the early hours of an accident. This became possible trough the development of the HERCA-WENRA Approach (HWA). The DRP contributed very actively. The HWA has been adopted by both organizations in October 2014.

Luxembourg has implemented most of the recommendations of the HWA during the elaboration of the new emergency response plan in case of a nuclear accident and actively promotes its implementation (see on page 30).

International peer review services

Luxembourg has applied for its first IRRS mission to take place in 2018. Two agents of the DRP have participated in IRRS missions in 2014 and 2015 respectively. Part of the challenge is the review against the IAEA standards, while Luxembourg usually seeks conformity with EU legislation.

Regulators' independence, transparency and openness as well as international cooperation.

The department of radiation protection (DRP) within the Directorate of Health of the Ministry of Health is the acting regulatory body charged with the protection of the population against the hazards of ionizing and non-ionizing radiation, as well as with nuclear safety and the safety of radioactive waste management.

The Ministry of Health is not involved in any energy policy activities, allowing a functional separation between the functions of the DRP and those of any other body or organization concerned with the promotion or utilization of nuclear energy.

Early 2016, the DRP's webpage www.radioprotection.lu has been restructured with a new layout and updated content. At present it exists only in French, but translation to German is foreseen. Early 2015, the Ministry of Health has established an own press office, in order to centralize communication with the media. With the help of the press office, it was possible to get a better coverage in the media on some of the DRP projects.

International cooperation is considered as a means to maintain competence. The DRP is therefor actively involved in several international activities, particularly concerning emergency preparedness and medical exposures.

Lessons learned from the Fukushima Daiichi Accident and lessons in the IAEA Director General's Report on the Fukushima Daiichi accident.

In the area of emergency preparedness, the DRP has assessed the lessons learned from the Fukushima Daiichi Accident and lessons in the IAEA Director General's Report on the Fukushima Daiichi accident.

Focus has been given on enhancing information exchange with neighboring states. A new protocol for information exchange has been signed on 15th January 2015 between ASN and IRSN for France and ASS and DRP for Luxembourg. On 14th May 2013, the Belgian Minister of Interior and the Luxembourgish Minister of Health signed, in the name their respective Governments, a cooperation agreement on nuclear safety and radiation protection. It established a Belgo-Luxembourgish Commission of nuclear safety and radiation protection that shall meet once per year for discussing issues of common interest.

A related area is the reaction of the countries in Europe to that distant event in Japan. The countries around the globe solved very differently questions related to the communication with the own Permanent Representations, the return of people from the affected areas, imports of foodstuff and goods, and recommendations to own citizens. The DRP therefore participated actively in the elaboration of the HERCA report "Practical proposals for further harmonization of the reactions in European countries to any distant nuclear or radiological emergency", approved by HERCA on June 2013. Luxembourg has implemented nearly all of the recommendations from that report. Only the organization of a reception center at the airport for the return of people from the affected area has not yet been finalized.

Challenges form the 6th Review Meeting

At the 6th review meeting, the rapporteur challenged Luxembourg with:

Challenge 1: Update of legal framework in connection with EU Directives and replacing the Act from 1963.

Response: The DRP and the legal service of the Ministry of Health have intensively worked over the last 2 years on a project for a new law and executive decrees. The project includes the transposition EU-BSS directive and the amended nuclear safety directive (EU-NSD). All existing provisions with regard to radiation protection, nuclear safety and radioactive waste management are revised. The adoption in the parliament is scheduled for the second half of 2017. At this stage of the discussion, however, it is not yet possible to report on the draft provisions under the relevant articles.

Challenge 2: Preparation of the first IRRS mission (scheduled for 2018).

Response: see above.

Challenge 3: Maintaining the momentum of engagement in nuclear emergency issues by all actors involved including further development of arrangements for emergency and post-accidental situations.

Response: Maintaining the momentum of engagement in nuclear emergency issues by all actors' involved remains a challenging issue. Especially authorities generally involved in crisis management got other priorities during the recent years, basically due to security issues. Concerning the safety aspects of emergency preparedness, Luxembourg has nevertheless started its project on post-accidental situations, though slower than initially foresee. A meeting was set up early 2016 with the French ASN to discuss experiences and

several aspects of the project. Under the lead of the HCPN a project for elaboration of a post-accidental plan has been elaborated, based on which the Government charged the HCPN in March 2016 to coordinate the work on such a plan. The work has started in May 2016.

Other recent developments

Other recent main activities are:

- Adoption of the new emergency intervention plan in the case of a nuclear accident by the Government in Council on 15 October 2014;
- Revised and updated public information campaign in 2014/2015 including a dedicated multilingual website www.infocrise.lu and a new brochure;
- With the amendment of 24 November 2015of the law of 21 November 1980 concerning the organization of the Directorate of Health, the safety of radioactive waste management has been formally added to the competences of the DRP.
- On 16 December 2015 a regulatory act was adopted for transposition of directive 2013/51/EURATOM of 22 October 2013 laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption.

Planned/ongoing activities

In the area of nuclear safety, there are no new activities planed. The following projects will be continued. Considering the effort needed to finalize these projects, they remain highly challenging for a small country:

- In the context of the transposition EU-BSS directive and the amended nuclear safety directive (EU-NSD), a complete revision of the framework law of 1963 and its executive decrees in ongoing. The adoption in the parliament is scheduled for the second half of 2017. The provisions of the new law will update and strengthen all provisions related to radiation protection, nuclear safety and radioactive waste management;
- Implementation in cooperation with neighboring states of the HERCA-WENRA Approach;
- Elaboration of a plan for the management of a post-accidental situation.
- First IRRS mission to take place in 2018

Vienna Declaration on Nuclear Safety (VDNS)

Luxembourg welcomes the compromise achieved at the diplomatic conference and believes that Contracting Parties should aim at an ambitious implementation of the objectives outlined in the VDNS. The DRP has participated at the Technical meeting on the implementation of the Vienna Declaration on Nuclear Safety (VDNS) in Buenos Aires, from 16 to 17 November 2015. During that meeting, the DRP presented ideas for ensuring that the safety objectives of the Vienna Declaration form an integral part of considerations during future RM of CP's and that they will be used as a reference to help strengthening the peer review process of the CNS. Those ideas have been uploaded by Luxembourg on the restricted website of the CNS.

The two below statements, made at the meeting in Buenos Aires, give encouragement to countries without nuclear installations to contribute to the global effort.

- The sum of the individual measures is the key to obtain the overall objectives of the CNS and the VDNS.

- The reporting on emergency preparedness measures in the spirit of the VDNS also concerns countries without NPP's. These could be encouraged to report more explicitly on their efforts to enhance their measures to mitigate the consequences off-site.

Luxembourg has increased its efforts in EP&R. A new emergency plan has been elaborated, exercises were held, bilateral arrangements were up-dated, harmonization of the EP&R arrangements has become a priority, equipment is being modernized and work on a post-accidental plan has started.

C - Reporting Article by Article

Article 7. Legislative and regulatory framework

ARTICLE 7. LEGISLATIVE AND REGULATORY FRAMEWORK

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

Art 7 (1): Establishing and maintaining a legislative and regulatory framework

Art 7 (1a): Overview of the primary legislative framework

In 1963, a framework law was enacted on the Protection of the Public Against the Hazards of Ionizing Radiation. This framework law was last amended in 1995. It is the legal basis for executive regulations concerning all types of uses of ionizing radiation emitting products. It sets out the basic principles regarding radiation protection and nuclear safety, it defines competences for ad-hoc decisions in a radiological or nuclear emergency situation and sets the frame for enforcement.

The law of 21 November 1980 concerning the organization of the Directorate of Health establishes the regulatory body by attributing the competences concerning the protection against hazards of ionizing and non-ionizing radiation, as well as nuclear safety to the department of radiation protection (DRP). **New:** That law has been amended on 24 November 2015. The safety of radioactive waste management has been added to the competences of the DRP.

In some areas, such as maximum permitted levels of radioactive contamination of foodstuffs, specific EU-Council regulations are directly applicable in all EU member states. Those acts are not listed in the present report.

Ongoing activity: In the context of the transposition EU-BSS directive and the amended nuclear safety directive (EU-NSD), the DRP works on a complete revision of the framework law of 1963. The adoption in the parliament is scheduled for the second half of 2017. The provisions of the new law will update and strengthen all provisions concerning radiation protection, nuclear safety and radioactive waste management. At this stage of the discussion, however, it is not yet possible to report on the draft provisions under the relevant articles.

Art 7 (1b): International Conventions and bilateral agreements

Luxembourg ratified all international conventions relevant to nuclear safety and concluded several bilateral agreements. Those ratifying acts are listed in the appendix. Though not directly linked to the CNS, it is worth to mention that the conventions on nuclear liability were never ratified by Luxembourg.

The most relevant bilateral agreement has been signed on 11 April 1983 with France, concerning the exchange of information in case of an incident or accident susceptible of having radiological consequences. This agreement consists of the following main clauses:

- Mutual information without time delay about incidents or accidents happening in one of the state territories which might have radiological consequences susceptible of affecting the territory of the other state;
- Creation of an appropriate information system that works 24/24 hours;
- Definition of a set of key information that will be exchanged;
- Modalities for the exchange of a liaison officer in case of executing the intervention plan.

In order to handle all the bilateral questions concerning nuclear safety, a Franco-Luxembourgish Commission has been created in 1994, as well as two technical groups having the aim to solve practical and technical issues. Regular meeting of these groups are organized. The 14th meeting of the Franco-Luxembourgish Commission took place on 4th February in Paris.

New: At the 13th meeting of the Franco-Luxembourgish Commission on 15th January 2015 in Luxembourg, an updated information exchange protocol has been signed between ASN and IRSN for France and ASS and DRP for Luxembourg. The main aim of the protocol is to exchange information during an emergency situation that allows for coherent protective actions on both sides of the border (see also article 16).

The government of the Grand Duchy of Luxembourg and the government of the Kingdom of Belgium concluded 28 April 2004 an agreement concerning the information exchange in case of an incident or accident, which might have radiological consequences. This agreement was ratified in Luxembourg on 27 April 2006 by law.

On 14th May 2013, the Belgian Minister of Interior and the Luxembourgish Minister of Health signed, in the name their respective Governments, a cooperation agreement on nuclear safety and radiation protection. It established a Belgo-Luxembourgish Commission of nuclear safety and radiation protection that shall meet once per year for discussing issues of common interest, in particular:

- Exchange of information related to the NPP Tihange.
- Cooperation on the radiological protection of workers, the population, patients and the environment.
- Organization of environmental monitoring.

National contact points for the agreement are the AFCN for Belgium and the DRP for Luxembourg. The agreement entered into force with its signature. The third meeting of the Belgo-Luxembourgish Commission has taken place on the 11th February 2016 in Brussels.

Art 7 (2) (i): National safety requirements and regulations

Art 7 (2) (i)a: Overview of the secondary legislation for nuclear safety

New: Regulatory acts (règlements grand-ducaux) and ministerial decrees (arrêtés ministériels) can be considered secondary legislation. The relation between primary and secondary legislation has changed in the recent years. While, back in 1963, it has been sufficient to adopt a framework law and to regulate all the details by regulatory acts, all principle provisions have now to be part of a law. Only the execution of those provisions can

be prescribed by regulatory acts. For this reason, not only the law as described under 7 (1a) is presently revised, but also the full set of regulatory acts. The schedule for its adoption is the same as for the new law.

Ministerial decrees are essentially used for individual ministerial decision, such as a license that includes licensing conditions. Administrative decrees do not exist.

In relation to nuclear safety, the regulatory provisions are not very detailed. In particular, aspects related to the operation or decommissioning of nuclear installations are not addressed. A list of all relevant acts and official agreements is given in the appendix. Those executive regulatory acts have been regularly amended in order to comply with the EU Council directives.

The main regulatory act, covering most of the aspects relevant to nuclear safety was adopted on 14 December 2000 to implement the 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. An amendment of that act was done in the context of the transposition of the Council Directive 2009/71/EURATOM of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations, hereafter nuclear safety directive. The amendment entered into force on 24 July 2011. On 30th July 2013 the latest amendment of the regulatory act of 14 December 2000 was promulgated. The amendment served to transpose the COUNCIL DIRECTIVE 2011/70/EURATOM of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste.

New: On 16 December 2015 the regulatory act was adopted for transposition of directive 2013/51/EURATOM of 22 October 2013 laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption. The act lays down parametric values and frequencies and methods for monitoring radioactive substances in drinking water. The DRP is in charge with the implementation of that act.

Art 7 (2) (i)b: Guides issued by the regulatory body

The only guides that have been issued by the DRP refer to the regulatory supervision in the non-nuclear sector (see also article 10).

Art 7 (2) (i)c: Overview of the process of establishing and revising regulatory requirements

The initiative for any legislative act or its amendment lies either within the parliament or at the competent Minister. It is worth to mention that the parliament has used its right for initiative only in few cases. It never did so in the area of nuclear safety or radiation protection. Over the last 20 years, the incentive for changing the national framework in this area came in all cases from a EU council directive with the obligation to be transposed into national law.

In practice, the DRP is at the technical level in charge with the preparation of draft text for those laws and regulatory acts. These drafts are then submitted to the department of legal affairs of the Ministry of Health for legal revision and the coordination of the legislative procedure. In case of a regulatory act, the draft is as a first formal step submitted to different institutions, such as the Chamber of Commerce and other relevant Ministries for opinion. Taking those opinions into consideration, the text of the proposed regulatory act goes through approbation by the Council of the Government and subsequently to the Council of State (Conseil d'Etat) for opinion. In case of a positive opinion, the responsible Ministers and the Grand Duke may adopt it by signature. It enters into force after publication or on a specific

date specified within the regulation. The Ministers who signed the regulation are responsible, everyone within his field of competence, for execution.

Laws are discussed after the opinion of the Council of State in the parliament. The adoption comprises a first and second vote. Ministerial decrees are just signed by the competent Minister.

Art 7 (2) (ii): System of licensing

The regulatory act of 14 December 2000 concerning the protection of the population against the dangers resulting from ionizing radiation defines a system of licensing for nuclear installations. Any project to build and/or operate a nuclear installation is subject to prior authorization by the Government in council, prohibiting thus the construction and operation of a nuclear installation without license. The application for a license has to be addressed to the Minister of Health, who is responsible for the formalities of the licensing procedure.

The Minister of Health transmits the administrative follow up to the DRP. All documentation relating to the enquiry is submitted for opinion to national, foreign and international specialized bodies. These bodies are not specified in the legislation and have to be chosen ad hoc in the specific case. The application and the written expert opinions are then submitted to a public enquiry organized by the mayors of the concerned municipalities. The enquiry consists of adequately announcing the license application to the public and depositing the complete documentation of the project at the mayor houses, where every interested person can consult it. All interested parties are heard and a written record of the proceedings at the enquiry is drawn up. The file is then transmitted to other involved Ministers, to the College of Medical Practitioners and to the Commission of the European Communities, according to article 37 of the EURATOM treaty. The competent authority (DRP) issues its opinion. The Ministry of Health collects all opinions. The Government in council lays down the conditions governing the granting of a license. If the license is refused, an explanatory statement must be given to the applicant.

The specific information to be supplied with the license application needs to comprise particular data of the applicant organization, the description of the installation, the site, the number of staff and their qualification levels, civil nuclear liability, plans of the installations and demographic, ecological, geological, seismological and meteorological details of the area within a radius of 25 km. The application must contain a safety report describing the most serious accidents that could occur in the installations, including an assessment of the probability and foreseeable consequences of each potential accident. The application must also contain full details of the expected radioactive effluents and on the management, purification and disposal of solid, liquid and gaseous radioactive waste.

Other licensing procedures are defined for the non-nuclear sector. Those are not part of this report.

Art 7 (2) (iii): System of regulatory inspection and assessment

Inspectors of the DRP follow an inspection program for all facilities holding radioactive material or X-ray emitting devices. The questionnaires used during inspections are partially derived from the IAEA-TECDOC-1526, “Inspection of Radiation Sources and Regulatory Enforcement”.

New: The inspection program has been revised and update in 2015 as part of the DRP’s participation into the feasibility study in support of the development of a level playing field for nuclear safety assessment by Regulators and Technical Safety Organisations in the

European Union, organized by the European Nuclear Safety Training & Tutoring Institute (ENSTTI).

Planned activity: In cooperation with HERCA, the DRP develops a mechanism for inspections focusing on the process of justification in medical imaging. The DRP will perform theses inspections in November 2016 in the context of the European Action Week. The goal will be to assess whether the different steps in the justification process take place in the medical imaging facilities and to identify weak links in the justification process among member countries. An outcome of this European Action Week will be an increased awareness on justification within the member countries.

Art 7 (2) (iv): Enforcement of applicable regulations and terms of the licenses

The inspectors of the DRP are entitled to impose appropriate measures in case of non-conformity. Some agents of the DRP are further attributed with the legal power of police officers. This enables them to enter day and night to any building with a suspicion of any illicit or dangerous activity involving radioactive material and report any incompliance directly to the prosecutor. Penalties are laid down in the framework law from 1963.

Article 8. Regulatory body

ARTICLE 8. REGULATORY BODY

1. Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 7, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.
2. Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy

Art 8 (1): Establishment of the regulatory body

Overview – Status, Missions, responsibilities and organizational structure

The executive competence in the field of radiological safety and radiation protection is attributed to the Minister of Health. The law of 21 November 1980 concerning the organization of the Directorate of Health defines a department of radiation protection (DRP) and allocates particular missions. Similarly to a number of other small countries, the DRP centralizes as a single department all competence of radiation and nuclear safety, both the regulatory and the technical expertise aspects. For instance the national laboratory for radiation physics is part of the DRP. The organization chart and the missions of each unit (**as of 1st January 2016**) is given figure 2.

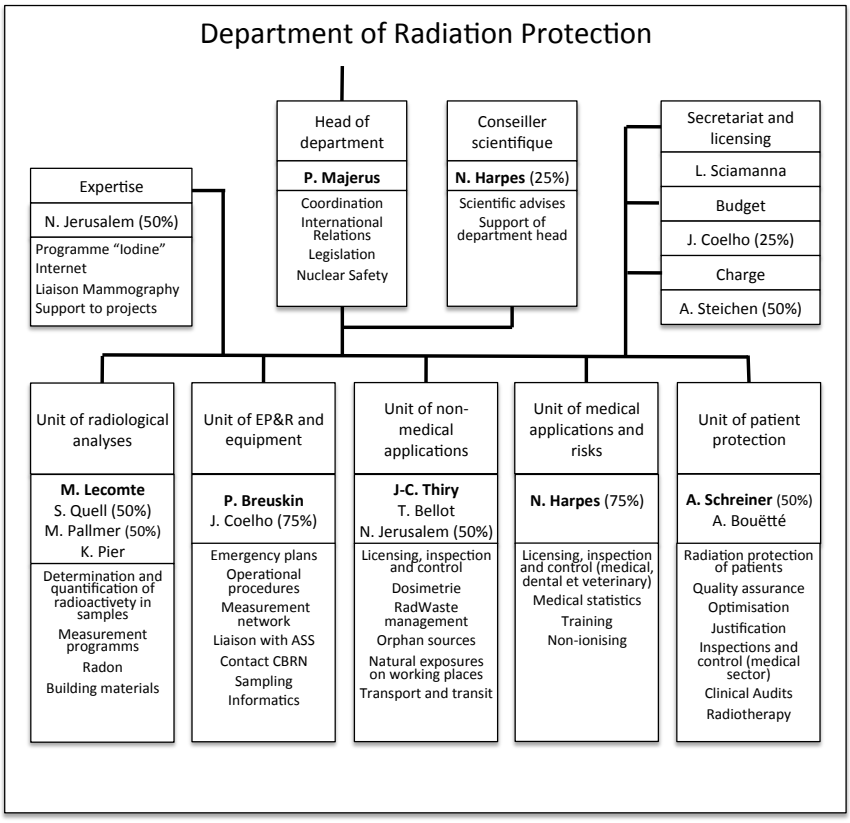

Figure 2: *Organization chart and missions of the DRP*

Human resources

The DRP is composed of 9 agents with master degree, including 4 with PhD, specialized in radiation protection (1), medical physics (2), nuclear physics and engineering (2), physics (1), geology (1), biology (1) and chemistry (1). The permanent staff of the DRP is further composed of one bachelor engineer, 2 technicians, 1 laboratory assistant and a secretary. Following the nuclear accident in Fukushima, Government has asked the DRP to increase efforts on nuclear safety and nuclear emergency preparedness and accorded an increase of staff of one person.

Maintaining competence

The DRP uses the training offers provided by the national institute of public administration to all public administrations in Luxembourg. Their offer includes standard training (such as management) and specific trainings on demand, such as specific training on laboratory accreditation and the ISO Norm 17025. All agents of the DRP are encouraged to set up an own multiannual training program and to schedule 1 to 2 weeks per year either training, participation in seminars or exchanges with homologue organizations. DRP agents have participated in international training sessions, such as the Basic Training Program for Analyst in Nuclear & Radiation Safety of ENSTTI and on International Law offered by the NEA.

Another important factor of maintaining competence in the nuclear safety domain is the active involvement in international activities. The professional exchange in meetings, such as the CNS-review meetings, ENSREG, WENRA and HERCA is highly beneficial for a small body like the DRP. This principle of active international cooperation as a means to maintain competence has also been confirmed by a new paragraph in the regulatory act of 14 December 2000 during its amendment in the context of the transposition nuclear safety directive.

Financial resources

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 non-predicable costs. This applies for example to expenses resulting from accidents and incidents. In the past the budget of the DRP has usually been increased at a yearly rate of about 4% in conjunction with the economic growth. In the years 2010 and 2011, the budget had however been frozen and remained at the 2009 level. **New:** From 2012 on, the budget has again experienced a small increase to compensate inflation. These financial resources allow the DRP to fulfil its obligations in an appropriate way.

The DRP has responsibility for the implementation of the allocated budget. The exception is the budget article for travel expenses, which is a common article for the Ministry and the Directorate of Health.

Adequacy of resources

The financial and human resources of the DRP are not extensive, but they have always allowed the DRP to fulfill its obligations in an appropriate way.

Art 8 (1i): Quality management system

New: From November 2014 on, the DRP has started to establish and implement a management system. A first step has been the elaboration of the organization chart. Figure 2 shows the version adopted in December 2015. This has allowed ensuring that the missions of

the DRP are properly assigned to the individual agents. In parallel, the DRP has elaborated and adopted a plan with all the projects that are not routine missions. The responsibilities, objectives, expected outcome and timeline is defined for each project. This plan is updated several times per year. At present the DRP elaborates detailed function descriptions for each agent and a work programme covering the next 3 years. The work programme will include the routine missions and the projects. Finally, probably early 2017, each agent will have its individual work program. While the DRP has started with an own management system in 2014, the directorate of health decided early 2016 to set up management systems for all its departments.

The laboratory of the DRP has established a quality management system in July 2010 (preparations started in 2007) within the laboratory of the DRP, with an accreditation according to ISO 17025. In line with the accreditation, the laboratory participates in laboratory inter-comparison exercises (IAEA ALMERA, JRC IRMM, etc.). The accredited techniques comprise gamma measurements in liquids and gross alpha/beta measurements. During the annual audits the laboratory aims at extending to other techniques.

Art 8 (1j): Transparency and information of the public

In April 2009, the Ministry of Health launched a new Internet Portal. www.radioprotection.lu gives a direct link to the DRP with relevant information on all aspects related to the missions of the DRP, such as legislation, explanations and guides for RPO's, specific reports, results of the environmental survey and information for the public on emergency preparedness. The homepage is up-dated and expanded at regular intervals. While the DRP is responsible for the content, a department of the ministries defines the layout. **New:** The structure of the page and the type how information is presented were revised recently. At present it exists only in French, but translation to German is foreseen. Some of the documents that can be downloaded, such as the present report, are provided in English.

The DRP also publishes on its Internet page the CNS-National Reports and the questions received with the answers immediately after their respective submittion to the CNS restricted website.

New: Early 2015, the Ministry of Health has established own press offices, in order to centralize communication with the media. In case of technical questions related to radiation protection or nuclear safety, the media now contact the press offices, who then arranges interviews with the DRP. This office also assists in finalizing press releases including their validation by the minister. Along with this goes an updated guidance on how to interact with the media and defines more precisely what type of information can be shared with the press (i.e. technical and factual information; information on programmes, projects, opinions that are adopted or published). With the help of the press office, it was possible to get a better coverage in the media on some of the DRP projects. Espescially a radon study and an action plan on medical justification got a lot of attention, including on TV.

Art 8 (1k): External technical support

A specific unlimited budgetary article allows the DRP in well-justified cases to engage external technical support. This was used in the past in the frame of specific licensing procedures and more recently to acquire an independent technical view on nuclear projects in the vicinity of Luxembourg's national borders (e.g. Stress-test or the French project for a geological repository of high level radioactive waste).

Art 8 (2): Status of the regulatory body

The DRP is a department within the Directorate of Health. The DRP reports via the Director of Health to the Minister of Health. The Ministry of Health is not involved in any energy policy activities, which fall under the competence of the Directorate of Energy of the Minister of Economy. This builds an effective and functional separation between the functions of the DRP and those of any other body or organization concerned with the promotion or utilization of nuclear energy.

On the other hand, a competent authority placed within the structures of a Ministry is subjected to ministerial instructions that may potentially be of a purely political nature and not founded on sole objective and verifiable safety-related criteria; though it is important to point out that this has never happened so far in the context of the DRP's fulfillment of its regulatory tasks. It is also clear that the DRP has no real autonomy in the implementation of the allocated budget, neither any competence in the decisions for the appointment and dismissal of staff. Those elements may question the effective independence from undue influence in its regulatory decision making as prescribed by the nuclear safety directive. Luxembourg is however confidant that the existing structure is proportionate with the national circumstances taking into account that the DRP has no regulatory supervision on nuclear installations.

Article 9 - Responsibility of the license holder

ARTICLE 9. RESPONSIBILITY OF THE LICENSE HOLDER

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

The sum of the regulatory requirements of grand-ducal regulation of 14 December 2000 attributes the full responsibility for the respect of all regulatory provision to the license holder. With the amendment of that regulatory act in the context of the transposition of the waste directive, this principle was further strengthened by a more direct formulation, as follows: “The licensee is responsible for the safe management of radioactive sources”.

The operational obligations of the licensee are in line with the provisions of the EU-BSS directive. All licensees are submitted to regular inspections by the DRP. No obligation exists for the license holder to maintain communication with the public.

Article 10 – Priority to safety

ARTICLE 10. PRIORITY TO SAFETY

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

With regard to the use of radioactive material, the principle of safety first is met by the sum of the regulatory requirements, although it is not explicitly laid down. In the context of the transposition of the waste directive, a new provision brings additional clarity.

The licensee has to demonstrate that internal procedures concerning the management of radioactive substances exist, are adequate and correctly applied. The DRP also developed some guides to help the licensee to establish those internal procedures (Guide to implement general procedures on radiation safety, Guide to perform risk assessments, Guide on internal intervention planning).

Concerning the medical field the regulatory act prescribes clinical audits, to services of nuclear medicine, medical imaging and radiotherapy.

Article 15 – Radiation protection

ARTICLE 15. RADIATION PROTECTION

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

By the regulatory act of 14 December 2000, 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. 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 provisions relating to exposure of the public and workers take into consideration the ALARA principle.

The DRP performs the dosimetry service. **New:** In 2015, a total of 2166 workers were monitored in Luxembourg, none of which exceeded the annual dose limit. The DRP also holds ready dosimeters (TLD’s) for the emergency workers. Procedures for distribution to the emergency workers in case of an emergency were set up in 2015, with the goal to insure rapid distribution of the dosimeters and adequate information to the emergency worker.

Article 16. Emergency Preparedness

ARTICLE 16. EMERGENCY PREPAREDNESS

1. Each Contracting Party shall take the appropriate steps to ensure that there are on-site and off-site emergency plans that are routinely tested for nuclear installations and cover the activities to be carried out in the event of an emergency. For any new nuclear installation, such plans shall be prepared and tested before it commences operation above a low power level agreed by the regulatory body.
2. Each Contracting Party shall take the appropriate steps to ensure that, insofar as they are likely to be affected by a radiological emergency, its own population and the competent authorities of the States in the vicinity of the nuclear installation are provided with appropriate information for emergency planning and response.
3. Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency.

Art 16 (1): Emergency Plan

Art 16 (1a): Overview of the arrangements and regulatory requirements for off-site emergency preparedness

Since the commissioning of the French nuclear facility in Cattenom in 1986, Luxembourg has set-up a special nuclear emergency response plan, which is focused but not limited to an accident at the Cattenom-NPP.

Laws define the competences of the Minister of Health and the Minister of Interior concerning the elaboration and execution of the response plan. For instance the law of 25 March 1963 attributes in its article 3 special competences to the Minister of Health for deciding ad-hoc measures for protecting people from radiation. Also the regulatory act of 14 December 2000 contains several provisions with regard to interventions in case of radiological or nuclear emergencies, as well as for long lasting exposure situations. Those form the legal basis for the existing special emergency plan of 2nd December 1994 and for deciding protective actions during a crisis.

Following the terroristic attacks of 9/11 in New York, the Government decided to put in place a High Commission of National Protection (HCPN) under the responsibility of the Prime Minister. Main missions of the HCPN are the coordination of crisis management during any crisis of national importance. A new law is proposed, but not yet adopted, who defines those missions and competences in more detail. With these changes a review of the existing emergency plan became necessary. Above the nuclear accident in Fukushima initiated the Government to decide on starting that review in April 2011.

New: In June 2011, the coordination task force started works on the main body of a new emergency response plan in case of a nuclear accident. The organizational structure of the crisis cells, alerts and communication channels, phases of an accident from first alert to post-accidental, planning zones and definitions of possible counter measures were reviewed and where necessary up-dated.

In 2012 and 2013 a draft version of the new plan was tested during the exercise series “3 in 1”, as has been reported in the previous national meeting. Lessons learned form these exercises were incorporated in draft plan.

The adoptions process of the new "emergency intervention plan in case of a nuclear accident" was as follows:

- 15 May 2013: Approbation by the High Level Council of National Protection (CSPN) on 15th May 2013.
- 26 July 2013: Presentation of the new draft plan to the Council in Government – the Council took note and charged to working groups to finalize the operational procedures.
- Presentation of the daft plan and its draft operational procedures to and discussions with:
  - the Ministers in charge on 26 May 2014;
  - the Association of Municipalities on 26 June 2014;
  - the Federation of the Hospitals on 17 July 2014;
  - the Syndicate of the Pharmacies on 25 July 2014;
  - the mayors/municipalities on 17 September 2014;
  - the pharmacies on 6 October 2014;
  - the Parliamentarian Commissions of Health and Internal Affairs on 10 October 2014;
  - Greenpeace on 15 October 2014.
- 15 October 2014: Adoption of the new emergency intervention plan in the case of a nuclear accident by the Government in Council;
- 21 October 2014: Presentation of the plan to the media and release of the website: www.infocrise.lu (details below);
- Octobre/Novembre 2014: Distribution of an information leaflet to all household on the measures to take in case of an emergency and distribution of potassium iodide tablets (details below).

Although important elements of the emergency arrangements have changed with the adoption of the new plan, as will be highlighted below, no consultations have taken place with the neighboring countries on the draft plan before its presentation to the public. This lack of consultation and coordination has put authorities in these countries under unnecessary pressure form their population.

Art 16 (1b): Overview and implementation of main elements of national plan for emergency preparedness, including the role and responsibilities of the regulatory body and other main actors, including State organizations

Complete new subchapter: The new emergency intervention plan in the case of a nuclear accident applies to all nuclear and radiological emergencies resulting from accidents, with particular focus on Cattenom.

Crisis organization

The execution of the plan falls within the competency of the Prime Minister and Minister of State, the Minister for Home Affairs and the Minister of Health. All the other ministries, agencies and departments of the State are bound to cooperate with the implementation of the plan using all the means available to them. Local authorities are considered key partners in this.

A crisis cell initiates, coordinates and monitors the execution of all the measures intended to deal with the crisis and its effects. It is composed of high-level representatives from the relevant ministries and administration, including the head of the DRP (see appendix 2 for complete composition). The Crisis Cell works closely with its foreign counterparts.

The crisis cell is assisted by:

- Operational Cells responsible for the execution of particular measures. Those cells are created ad-hoc depending on the need.
- A Radiological Evaluation Cell (REC): The REC is presided by the DRP, and composed of members both of the DRP and the ASS. The main mission of the REC is to suggest appropriate emergency measures to the Crisis Cell, monitoring changes to the state of the damaged reactor, the scale and changes to radioactivity in the environment and its impact on the population. The members of this cell also work closely with their foreign counterparts.
- An Communication and Information Cell (CIC). The task of the CIC is to support the CC in its efforts to coordinate communication between the authorities and the population. It keeps the media and citizens informed of the changing situation as well as the prescribed preventive and protective measures (see also article 16.2).
- Internal cells in all concerned Ministries. Those cells are charged with the execution measures and of the coordination within their respective competences. (Example: The coordination with the hospitals assumed by the internal cell of the Ministry of Health.)

Alerting

Protocols exist for the communication between the cells. At present, while the ICC is located within the structures of the CC, the REC is still on another site. Given the outstanding role radiological evaluation plays in a nuclear emergency situation, such physical separation is not satisfactory. Also at present, the CC still meets in a Conference Centre. For these reasons the HCPN has started a project to build a new crisis center, exclusively to be used for crisis management proposes and the integration of all main actors within the same structure during any type of crisis. This building is under construction.

As soon as the national contact point is informed of a nuclear accident, it alerts the Radiological Evaluation Cell, which immediately carries out an evaluation of the information available. If the accident is likely to pose a danger to the population, the High Commissioner for National Protection is informed. After consulting with the ASS and DRP, the High Commissioner for National Protection informs the Prime Minister and Minister of State who decides whether to activate the Crisis Cell (CC).

Following bilateral arrangements with France, the national contact point receives direct alerting by the operator of the Cattenom NPP. A dedicated network SELCA, (the System of exchange and liaison between Cattenom and the authorities) allows the exchange of information between the NPP, and the Prefecture in France, Rhineland-Palatinate (Germany), Saarland (Germany) and Luxembourg. The CC also immediately sends a liaison officer to the French Prefecture in Metz.

In the event of a nuclear emergency, the Crisis Cell calls on the ASS's Emergency Call Centre to trigger specific alert signals via the national siren network to warn the public. The plan distinguishes a thread phase, a release phase and a post accident phase.

Scenario based

The former plan had taken into account fast kinetic scenarios with smaller source terms and low kinetic scenarios with larger source terms. For the new plan, the possibility of fast kinetic accidents involving large releases was additionally taken into account to a certain degree, namely concerning the implementation of protective actions (see also ITD below). So far automatic triggers are not used (see also HERCA-WENRA Approach).

Planning zones

The primary planning zone is limited

- to within 15 km of the Cattenom NPP for evacuation;
- to within 25 km of the Cattenom NPP for ITB and sheltering;

The primary planning zone is divided into three alarm areas: East, Central and West. This separation enables separate alarm sirens to be triggered depending on wind direction and how urgent it is that the protective measures be implemented.

The secondary planning zone starts at the boundary of the primary planning zone and covers the rest of the country. The main towns in this zone will house the reception centers needed in the event of an evacuation. Measures are foreseen to extend ITB and sheltering into this zone.

For the post-accident phase, two separate zones are defined in line with the French CORDIRPA:

- Public Protection Zone (Zone de protection de la population, ZPP)
- Heightened Territorial Surveillance Zone (Zone de surveillance renforcée du territoire, ZST).

Protective actions

The emergency response plan sets out the four main protective measures set out in the table below. It also defines restrictions and bans concerning outside activities, individual health measures, clothing, protection against incorporation and specific measures for the river Moselle.

The new plan does not use intervention levels, but defines Reference Levels (RL) and also Operational Reference Levels (ORL). The use of reference levels shall give flexibility to adjust protective actions along the borders with neighboring states.

Protective Action	RLs	ORLs
Evacuation	100 mSv (eff., 7d, ext.+inh.)	
Sheltering **	10 mSv (eff., 7d, ext.+inh.)	100 microSv/h
ITB **	50 mSv (Thy., 7d, inh.)	100 microSv/h
Protection of food and livestock		1 microSv/h

** Sheltering and ITB are combined

Evacuation

The plan considers only two types of evacuation: pre- and post-release evacuation (no evacuation under the cloud). Evacuation is combined with access control. Reception centers will be set up in the north of the country.

ITB

With the new plan a preventive distribution of potassium iodide tablets to all the residents of the country has been organized. Additionally tablets are made available to all employers who receive an adequate stockpile for his employees on simple demand. The goal of this measure is to cover commuters during their stay in Luxembourg. New arrivers to Luxembourg will get their tablets at the place they first register.

The previously established stockpiles and mechanisms are maintained:

- KI stockpiles in the municipalities situated at a distance up to 25 km from Cattenom.
- KI stockpiles in all schools, including nursery schools;
- Pre-distribution to all newborns;

Responsibility of the DRP

The main responsibilities of the regulatory body (DRP) in the emergency preparedness remained mostly unchanged. They consist of:

- Participation in the CC;
- Presiding and participation in the REC;
- Participation in the internal crisis cell of the Ministry of Health;
- Advising the CIC;
- Activating and operating the laboratory in emergency mode;
- Providing dosimetry for emergency workers.

Radiation monitoring

The national program for the systematic monitoring and the surveillance of the radioactivity on the national territory, assures permanent control of the radioactivity in the air, water and soil on the national territory.

This national monitoring program comprises an automatic measuring and warning network for the environmental radioactivity as well as the systematic measurement of environmental samples and samples of the food chain. Actually the network stands for a permanent surveillance of potential radioactive emissions from nuclear facilities and an early warning of the DRP in case of a radioactive release.

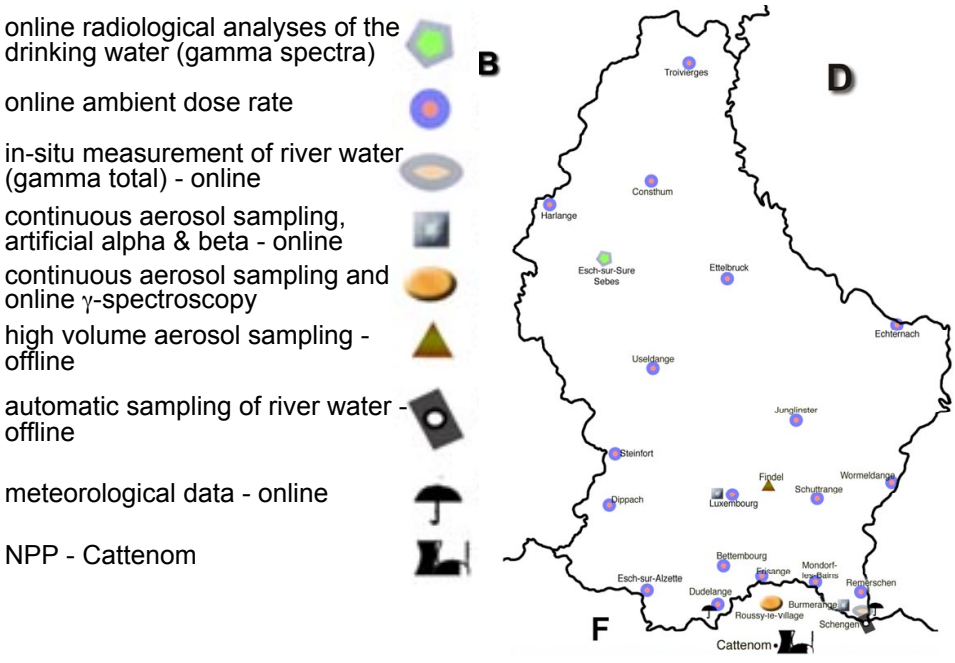

Figure 3: *National radiological monitoring network operated by the DRP*

In case of an emergency, 5 additional mobile stations can be added as necessary. These additional stations were acquired over the recent 5 years. With this dense, flexible and fully

automatic system, no handheld measures are needed. Only sampling groups are defined for verification of the actual contamination after release.

The DRP has now started to exchange and update the monitoring network as part of a financial plan running over 6 years. In 2016 the only station outside Luxembourg situated in France at half distance between the NPP Cattenom and the national border in Roussy-le-village is being exchanged. Most stations have operated since the late 80's.

The public can directly consult the measurements since May 2016 on www.radioprotection.lu focused on Luxembourg and www.gis-gr.eu/portal/themen-und-karten/umwelt/radioaktivitaet.html focused on the Greater-Region (in German and French).

Art 16 (1b): Training and exercises, evaluation activities and main results of performed exercises including lessons learned

According to the national legislation, the ASS and the DRP have to regularly organize national exercises or to participate in bilateral or international exercises on nuclear emergency. Since more than twenty years, the authorities have twice per year organized small-scale national exercises in order to train the specialized intervention teams of the Department of Civil Protection.

Given the relatively limited own resources and expertise, Luxembourg focuses its efforts on participating in international exercises. Such simulations of emergency situations have the advantage to face a higher degree of complexity and are thus more realistic. It also permits a mutual learning effect at all levels of participation.

Focused on a nuclear emergency at the Cattenom NPP, trilateral exercises are organized every three years between the two German federal States, Sarreland and Rhineland-Palatinate, Luxembourg and France. The last exercise of this kind took place in June 2013 (See previous national report).

Luxembourg participates in most INEX and CONVEX exercises.

Twice per year, field trainings for first responders and emergency workers take place. Those training sessions are held over one and a half day, with typically half a day theoretical training and one day field exercises.

New: No larger exercise has been held during the reporting period. Smaller exercises or trainings concerned particular elements of the new plan, covering topics such as sampling, dosimeter and laboratory measurements.

Art 16 (2): Information of the public

Art 16 (2): Overview of the arrangements for informing the public in the vicinity of the nuclear installations about emergency planning and emergency situations

A regulatory act was promulgated on 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. This regulation stipulates that the government has to inform the population in advance about the sanitary prevention measures and the optimized behavior during a radiological emergency.

New: With the adoption of the new emergency plan, the government has organized an information campaign consisting of the following main elements:

- Establishment of a crisis information website (www.infocrise.lu) to provides information on nuclear emergencies and presents all the information on

radioactivity in general and the nuclear sites located close to the Grand Duchy of Luxembourg in German, French and English. While the site was launched with regards to a nuclear emergency, the site now provides also information on 7 other crisis situations.

- Publication of a new brochure "What to do in the event of a nuclear alert" to inform the population, raise their awareness and prepare them for such an eventuality. The brochure exists as hard copy in German, French, Luxembourgish and English. It can additionally be downloaded in Portuguese and in a version of Easy Read German. The brochure is also available in Braille and in an audio version.
- Establishment of an office for crisis communication. This office, equipped with permanent staff is charged to update all available information and to organize communication during a crisis by making use of modern network communication platforms.

Art 16 (3): Emergency Preparedness from the perspective of a non-nuclear state and international arrangements.

Art 16 (3a): Measures for the preparation and testing of emergency plans that cover the activities to be carried out on their territory in the event of such an emergency

Given the fact that the French NPP Cattenom is with 8.5 km relatively close to the border of Luxembourg, most obligations on off-site emergency preparedness are identical for Luxembourg than for a Contracting Party with nuclear installations. For that reason the present report describes those elements under article 16.1 above.

However, a few issues are particularly related to the circumstances of having no own nuclear installation. Worth to mention are for instance:

- The national emergency response plan does not comprise action levels that would be triggered by the operator. Those "automatic" protective actions are in France based on a fast kinetic scenario with limited radiological consequences and concern only a couple of kilometers around NPP's and do not reach op to the border of Luxembourg. Implementing such type of reactions in Luxembourg would thus mean to create an inconsistency along the border with France.
- Luxembourg does not perform an own situation assessment, neither an own radiological prognosis but has concluded agreements with France for sharing their assessments. All exercises have indeed shown a high degree of uncertainty and margins of interpretation. Assessments done by 2 countries thus always result in decisions for protective actions that are inconsistent along borderlines.
- The size of Luxembourg having borders with three neighboring countries in the range of potentially affected territories of a nuclear accident explain why the DRP has always been in favor of harmonizing emergency preparedness in Europe. Therefore, the DRP and the ASS participated in a group of experts from France, Belgium, Germany, Switzerland and Luxembourg from early 2006 to July 2007 who developed proposals for a harmonized strategy, focused on iodine prophylaxis linked with other protective actions. Luxembourg implemented those recommendations in the following years.

New: The situation however remains very challenging, as emergency preparedness is not harmonized. During exercises some of the decisions taken are not coherent between neighboring states. If it concerns actions such as evacuation, the population will not

understand these differences, neither can they be explained during the crisis. Unfortunately discussions in the past, an also more recently, have clearly shown too much opposition in Europe for an harmonization of emergency preparedness arrangements. Luxembourg has taken the position that an alternative mechanism should be developed to enable at least an alignment of the response in the early hours of an accident. This became possible trough the development of the HERCA-WENRA Approach.

HERCA-WENRA Approach (HWA)

New: The DRP has chaired the HERCA working group "emergencies" from 2011 to 2014 with the goal to elaborate a new operational approach for achieving better consistency of protective actions between neighboring European Countries during a nuclear emergency in Europe or elsewhere, resulting in the adoption of the HERCA-WENRA Approach in October 2014 by HERCA and WENRA.

The HERCA-WENRA Approach represents the alternative to harmonization of the preparedness arrangements. It consists basically of a coordination mechanism during the response, enabling neighboring states to act consistently. Above that, the approach contains principles to manage a situation of a Severe Accident requiring Rapid Decisions for Protective Actions, while very little is known about the situation. While the approach focuses on the response, it contains also key suggestion for improving preparedness, since in particular coordination during response needs to be prepared. Above, the HWA calls for reducing differences in existing preparedness arrangements between neighboring states and to include more flexibility in decision taking. The HWA will help to implement also recommendations contained in the IAEA Director General's Report on the Fukushima Daiichi accident, such the call to improve consultation and sharing of information among States on protective actions and other response actions.

I will now be important to implement the approach in all areas with NPP's close to a national border. Luxembourg therefor:

- proposed and brought to adoption of the Council conclusions on Off-site nuclear emergency preparedness and response, adopted by the Council at its 3439th meeting held on 15 December 2015,
- continued participation in the HERCA working group "emergencies", dealing with operational issues related to the implementation of the HWA,
- initiated an ENSREG review of the status of implementation of the HWA end of 2015,
- participated in a workshop on the implementation of the HERCA-WENRA Approach with participation of Civil Protection Competent Authorities, in Bled, Slovenia on 13-15 June 2016, and
- plans a regional workshop on the implementation with all stakeholders of the Greater Region in 2017 in Luxembourg.

For Luxembourg the HERCA-WENRA Approach represents the way forward for a more harmonization of emergency preparedness and response in Europe. However, the implementation of this Approach is a long journey requiring the active cooperation of all relevant authorities. At national level, most arrangements are globally in line with the HWA. A few areas still need attention, in particular:

- Extension of trans-border coordination mechanism for protective measures in the response phase to needs to be enlarged to other potentially affected areas (DE and BE) and its application needs to be strengthened. Exists on basis of bilateral

protocols with FR, both between the safety authorities and between decision takers.

- Robust communication mechanism to allow fast decisions to be taken in case of an accident with potentially large releases in a fast kinetic scenario.

Art 16 (3b): International arrangements, including those with neighbouring States

Bilateral agreements exist with France and Belgium, as explained under article 7. The agreement with France is complemented by operational arrangements, such as:

- On the regional scale a specific system for communication between the authorities and operator has been established. This "System of Exchanges and Liaison between Cattenom and the public Authorities (SELCA) connects the "Préfecture de la Moselle" and the Cattenom NPP to the competent authorities in Germany and Luxembourg (see also on page 25). Technically it is now a satellite fax-connection, located in Luxembourg at the "112" emergency call center and at the DRP.
- Information exchange protocol between the NPP and the Prefecture in Metz in France and the DRP and ASS in Luxembourg on the notification and information in case of incidents and accidents at the Cattenom NPP, enabling direct exchanges of the NPP with the neighboring country authorities and the exchange of liaison officers.
- Mandate and role of the liaison officer.
- Procedure of information in case of potential media interest (see informing on incidents).
- Protocol on information exchange during an emergency between ASN/IRSN, and DRP/ASS with the aim to coordinate protective actions along the border.

Appendix

1) Laws, regulatory acts and degrees

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 12 June 2006 concerning the creation of the rescue services agency.

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.

Law of 28 July, 2011, 1) approving the Amendment to the Convention on the Physical Protection of Nuclear Material, adopted at Vienna, July 8, 2005; 2) amending the amended law of 11 April 1985 approving the Convention on Physical Protection of Nuclear Material, opened for signature at Vienna and New York dated March 3, 1980.

Regulatory act of 27 November 1987 concerning the admissible levels of radioactivity in foodstuffs.

Regulatory act 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.

Regulatory act of 14 December 2000 concerning the protection of the population against the dangers arising from ionizing radiation.

Regulatory act of 3 march 2009 on the supervision and control of shipments of radioactive waste and spent fuel (transposition Council Directive 2006/117/EURATOM of 20 November 2006).

Regulatory act of 6 May 2010, defining the specific missions, the composition, organization and operation of the department of civil protection of the rescue services agency.

Regulatory act of 16 December 2015 on the quality of water intended for human consumption.

Emergency intervention plan in case of a nuclear accident, adopted by the Government in Council on15 October 2014.

Agreement of 14 May 2013 between the Minister of Health, Luxembourg in the name of the Government of the Grand Duchy of Luxembourg and the Minister of Interior, Belgium in the name of the Government of the Kingdom of Belgium on the organization of the bilateral cooperation on nuclear safety matters and radiation protection.

2) Composition of the crisis cell in case of a nuclear accident

The basis composition of the crisis cell includes:

- High Commissioner for National Protection;
- Director of Health;
- Head of the DRP;
- Director of ASS;
- Director General of the Police;
- Army Chief of Staff;
- Director of the office for crisis communication;
- Director of State Intelligence Service;
- Director of the Customs and Excise Agency;
- Manager of the Government Communication Centre;
- A representative from the Ministry of Family Affairs, Integration and the Greater Region;
- A representative from the Ministry of Home Affairs;

These permanent members may be accompanied or represented by his/here substitute. Depending on the circumstances, the CC is enlarged with as follows:

- A representative from the Ministry of Foreign Affairs;
- A representative from the Ministry of Education;
- A representative from the Ministry of Agriculture;
- A representative from the Ministry of Transport;
- A representative from the Ministry of Economy;
- Director of the Water Administration;
- Director of the Road Administration;
- Director of Environment;
- Director of the Computer Technologies Center;