LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de la Santé
et de la Sécurité sociale

Direction de la santé

LUXEMBOURG

Report to the 10th Review Meeting of the Convention on Nuclear Safety

Luxembourg, August 2025

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INTRODUCTION

About This Report

This National Report (NR) fulfills Luxembourg's obligations under Article 5 of the Convention on Nuclear Safety (CNS). This report was prepared by the Division of radiation protection (DRP), designated as the regulatory body, in consideration of the updated requirements of INFCIRC/572 from the 3rd extraordinary meeting in 2024:

According to the CNS definition, Luxembourg is a Category 4 Contracting Party (CP). However, due to its unique territorial circumstances, with nuclear installations located less than 10 km of the border, it opted to categorize itself as a Category 3 CP. As such, it only has to report under sub-Article 16.3, but will also voluntarily provide information under Articles 7, 8, 9, 10, 15 and 16.1 and 16.2This NR uses blue shading to indicate information that is new or significantly different from information in the previous NR.

Nuclear Program in Luxembourg

Luxembourg has no nuclear program in the context of the CNS, i.e., no NI. However, it does have facilities close and very close to the Luxembourgish territory as shown in the graph below.

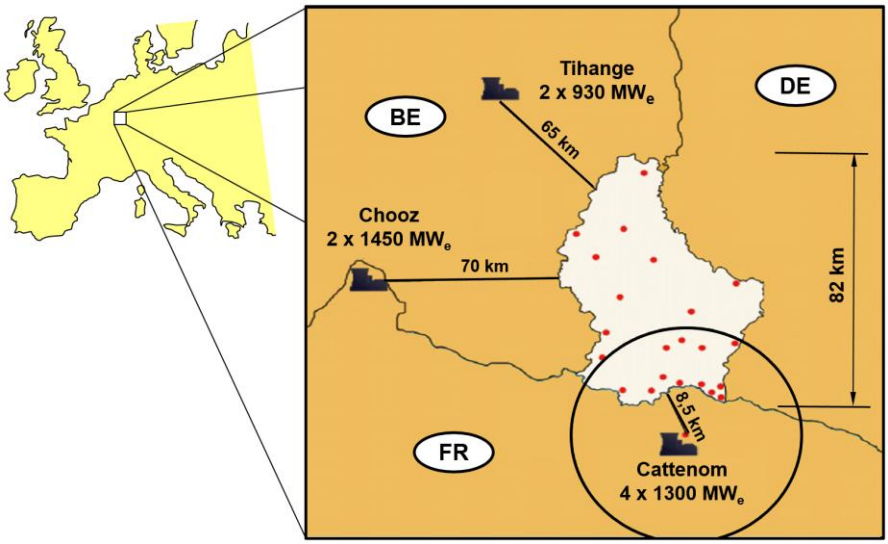

Fig. 1: Location of the nearest NPP's to the Luxembourgish border.

No nuclear power plant, fuel-cycle facility, research reactor, or other nuclear facility is operated or planned in Luxembourg. However, in its immediate vicinity, several facilities are located. Just 8.5 km south from the national border, the French utility EDF operates the Cattenom NPP, which comprises four 1300 MWe reactors. A second French facility, the Chooz NPP with two reactors of 1450 MWe each, is located approximately 70 km west of Luxembourg. In Belgium, the Tihange plant consists of two operating reactors (2 x 930 MWe) and one reactor in permanent shut down since January 2023. The plant is situated about 65 km northwest of the closest Luxembourgish border point. The closest German NPPs, Biblis and Philipsburg, both permanently shut down in March 2011 as part of Germany's nuclear phase-out policy, are located approximately 150 km east of Luxembourg. Other operating NPPs within a range of 150 to 250 km include Doel (Belgium), Nogent-sur-Seine (France) and Borssele (Netherlands).

Decommissioned NPPs within this range include Fessenheim and Neckarwestheim in Germany.

Relevant Nuclear Installations

Luxembourg is a Category 3 Contracting Party. As such, it has no nuclear installations (NI) subject to the CNS. However, NI are located in close proximity to its territory, most notably the Cattenom site, situated only 8.5 km from the Luxembourgish border.

Table 1 provides details on the nuclear site closest to Luxembourg and the reactors located there.

Table 1: Relevant Nuclear Installations.

Location	License Holder	Unit	Type	First Criticality	Capacity (MW_e)	Status
Cattenom 1	EDF	1	PWR	1986	1300	Operating
Cattenom 2	EDF	2	PWR	1987	1300	Operating
Cattenom 3	EDF	3	PWR	1990	1300	Operating
Cattenom 4	EDF	4	PWR	1991	1300	Operating

SUMMARY

Luxembourg is a Category 3 Contracting Party to the CNS. As such, it has only to report under sub-Article 16.3 but will voluntarily provide also information to the following articles: 7, 8, 9, 10, 15 and 16.1 as well as 16.2. As noted in this report, Luxembourg fulfills all these Articles.

Summary of Responses to Applicable Challenges and Suggestions

Luxembourg has addressed the challenges and suggestions that remain open from previous RMs as follows:

Challenge 1 from Joint 8th & 9th RM (Article 7)

➔ *Luxembourg should implement the IRRS action plan.*

The implementation of the IRRS mission action plan is considered complete. All 24 recommendations and 7 suggestions have been addressed and were primarily incorporated in the law and its corresponding regulatory act of radiation protection adopted in 2019.

In addition to the legislative and regulatory act, a few actions were addressed but remain in continuous progress:

- the human resources plan is continuously under development (see Article 8);
- the formalization of the exercise program will be addressed in the context of the ongoing revision of the national nuclear emergency plan. (See Article 16.1)

Challenge 2 from Joint 8th & 9th RM (Article 16)

➔ *Luxembourg should reorganize the radiological evaluation center, who performs nuclear and radiological assessment for nuclear emergencies. As well as updating its missions, procedures and tools and ensuring regular training and drills.*

Luxembourg has concluded that this challenge remains ongoing. The revision of the national nuclear emergency plan was announced by the HCPN at the end of 2024 and will include the update to missions, procedures and operational tools. (See Article 16.1)

Annual training with the French authorities is ensured through the updated bilateral protocol on information exchange in the event of a nuclear accident. (See Article 16.3)

Challenge 3 from Joint 8th & 9th RM (Article 16)

➔ *Luxembourg should update their procedures for information exchange for cross-border cooperation on emergency response in line with HERCA-WENRA Approach*

Luxembourg has updated the protocol on information exchange in the event of a nuclear or radiological emergency with its neighboring country France. The process of signature of the revised protocol is ongoing. (See Article 16.3)

Challenge 4 from Joint 8th & 9th RM (Article 16)

➔ *Luxembourg should develop a strategy for the management of a post-accident situation.*

This remains a challenge and will be addressed during the revision of the national nuclear emergency plan. Key issues to be covered include enhancing the plan's operability, fully implementing the requirements of GSR part 7 and updating the OILs. (See Article 16.1)

Summary of Other Significant Changes Since Previous Report

In addition to the efforts described above to address the challenges and suggestions that are remaining from previous RMs, Luxembourg has undergone the following significant changes:

Regarding Article 8:

- A change in leadership has occurred within the regulatory body, following the departure of the head of division and head of Department Health Protection in August 2024.
- The laboratory is currently facing a shortage of staff due to long-term illnesses.

Regarding Article 15:

- The DRP has ended its dosimetry service.

Notable Achievements

During the review period, Luxembourg achieved the following notable milestones:

Regarding Article 16:

- Implementation of the Cell Broadcast Alert System "LU-Alert" to enhance public warning capabilities in case of emergencies. (Article 16.2)
- Strengthened collaboration between CGDIS and DRP for improved management of nuclear or radiological accidents. (Article 16.3)
- Expansion of the DRP internal on-duty service to ensure continuous readiness and response capability. (Article 16.3)

Regarding other articles:

- Revision of the licensing conditions. (Article 7.2)
- A national declaration for the effective independence of DRP. (Article 8.2)
- Development of additional guidance in the medical field concerning justification, management of significant events and others. (Articles 10 and 15)

Future Focus

Luxembourg has identified the following areas that require future attention and sustained effort:

- Revision of the national nuclear emergency plan (Article 16.1) including,
  - Strengthening collaboration among the involved national administrations,
  - Incorporating key elements of the post accidental monitoring strategy
- Preparation of the second IRRS mission in 2028. (Article 7)
- Investment in human resources, particularly the recruitment of experienced staff, considering upcoming retirements and ongoing long-term illnesses and continued investment in capacity building. (Article 8)
- Non-medical imaging exposures. (Article 15)

Planned Improvements

In addition to the efforts outlined above; Luxembourg is planning the following improvements:

- Development of a national resilience strategy. (Article 16.3)
- Expansion and formalization of the emergency exercise program to include other involved administrations. (Article 16.3)
- Closer coordination with operational administrations for effective management of the post-accidental phase of a nuclear accident. (Article 16.3)
- The critical use of artificial intelligence in medical radiological procedures. (Article 15)

Major Common Issues

At the previous RM, several major common issues were identified. Table 2 below shows which of these issues concern Luxembourg and where they are addressed in the present report.

Table 2: Reporting on Major Common Issues which apply to Luxembourg.

Major Common Issue	Article
Foster international peer review missions and timely addressing of findings	7.2
Strengthening EP&R arrangements and fostering cross border collaboration	16.3

REPORTING ARTICLE BY ARTICLE

Article 7: Legislative and Regulatory Framework

1. Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations.

2. The legislative and regulatory framework shall provide for:

(i) the establishment of applicable national safety requirements and regulations;

(ii) a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a license;

(iii) a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licenses;

(iv) the enforcement of applicable regulations and of the terms of licenses, including suspension, modification and revocation.

7.1 Establishing and Maintaining a Legislative and Regulatory Framework

Overview of the primary legislative framework

The primary legal instrument for nuclear safety in Luxembourg is the law of 28 May 2019 on radiation protection [13], which entered into force on 1 August 2019. It transposes the EU-BSS directive (Directive 2013/59/EURATOM) into national law and repeals the previous legal framework, notably the act from 1963. In addition to this law there is the Grand-Ducal regulation from 1 August 2019 on radiation protection [14], which specifies certain regulations more in detail, than the aforementioned law.

The main principles of the previous framework were retained and reinforced. It should also be noted that the previous framework has been in conformity with the new directive on nuclear safety (2014/87/EURATOM). Even though, the new framework contains some additional provisions from that directive in order to further strengthen compliance. The new law mainly ensures to:

- Modernize the national legislative framework for the control and monitoring of practices involving radiation sources, such as those used in nuclear medicine. The level of regulatory control follows a graded approach.
- Simplify the administrative procedures for low-risk equipment, such as baggage screening scanners. For all these practices, the law establishes a system of authorization, inspections and sanctions by the regulatory body.
- Define requirements regarding training and continuous education necessary for the exercise of a practice, the compulsory consultation of experts, the individual protection of workers and the information of workers on the potential risks. Concerning the experts, the law creates the new professions of expert in medical physics and expert in radiation protection.
- Specify the responsibilities of the referring physician and the medical practitioner in the field of medical exposures to ensure the justification and optimization of medical radiological procedures.

- Broaden the scope of the law to include exposure from natural sources of radiation, including the protection of aircrews from cosmic radiation, radon exposure in dwellings and workplaces, exposure from building materials and protection of workers from naturally radioactive materials.
- Clarify the responsibilities and criteria for the protection of the population in order to cope with the possibility of a nuclear or radiological accident. In this area, it strengthens the implementation of the emergency response plan.
- Establish closer collaboration between Member States and to ensure participation in international peer reviews concerning nuclear safety.
- Forbid some practices, such as the construction and operation of nuclear installation.

Further information on several of these provisions are reported following the INFCIRC/572 guidance under the applicable articles.

The implementation of this radiation protection law was carried out through the adoption of a comprehensive action plan, comprising 18 actions of high importance, 20 actions of medium importance and 9 actions of lower importance. While most of these actions have been completed, some actions related to EPR remain ongoing and are being addressed as part of the revision of the national nuclear emergency plan. Additional details on EPR are provided under Article 16.

7.2 Provisions of the Legislative and Regulatory Framework

Luxembourg hosted its first IRRS mission in 2018 [20]. The review resulted in 24 recommendations, 7 suggestions and 3 Good Practices across various areas. These are reflected, where applicable, in the relevant articles of this report.

The implementation of the corresponding action plan is considered complete. All recommendations and suggestions have been addressed, primarily through their incorporation into the Luxembourgish law on radiation protection and its corresponding regulatory act, both adopted in 2019 [13, 14].

In addition, the following measures were taken:

- The mechanism to ensure the effective independence of the DRP was strengthened by a national declaration issued in 2021; (see Article 7.2 (i))
- Suggestions and recommendations related to EPR will be further addressed in the revision of the national nuclear emergency plan. (see Article 16)

Given the relatively limited changes in Luxembourg's legislative and regulatory framework as a non-nuclear CP, no follow-up IRRS mission was invited. However, Luxembourg plans to invite the next IRRS mission in 2028, to ensure alignment with the NSD (Directive 2014/87/Euratom).

7.2 (i) National Safety Requirements and Regulations

Overview of the legislative framework

The nuclear legislative and regulatory framework of Luxembourg was updated in 2019 to comply with all international obligations and constitutional requirements. In recent years, the relationship between primary and secondary legislation has evolved significantly. Historically, as early as 1963, it was sufficient to adopt a high-level framework law, with detailed provisions delegated to secondary legislation (regulatory acts). However, following a constitutional revision in 2007, key provisions require a far more detailed legal basis, and only further details of those provisions can be prescribed by regulatory acts. The figure below illustrates the hierarchical structure of Luxembourg's current regulatory framework.

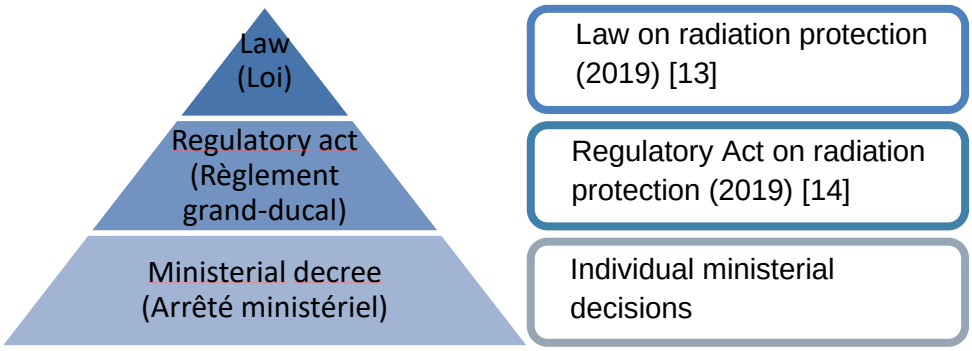

Figure 1: Hierarchy of the nuclear regulatory framework.

In the process of the establishment of a new legal framework as described under article 7.1 the main regulatory acts have as well been repealed and replaced by a single regulatory act on radiation protection. The new regulatory act on radiation protection entered into force on 1 August 2019. [14]

The initiative for legislative acts or amendments can originate either from Parliament or the competent minister. However, parliamentary initiatives are rare, and to date, no initiative has originated from Parliament in the fields of nuclear safety or radiation protection. Over the past 25 years, all legislative changes in this area have been driven by the need to transpose EU council directives into national law.
Legislative proposals are discussed in Parliament after receiving the opinion from the Council of State (Conseil d'État) and are subject to two readings before adoption. In contrast, ministerial decrees are signed solely by the competent Minister or Director.
In practice, the DRP is at the technical level in charge of the preparation of the draft text for those laws and regulatory acts. These drafts are submitted to the department of legal affairs of the Ministry of Health and Social Security for legal review and coordination of the legislative procedure. For regulatory acts, the draft is first formally submitted to relevant stakeholders, such as the Chamber of Commerce and other relevant ministries for opinion. The opinions are considered during the revision process. Following this consultation, the proposed regulatory act is submitted for approval by the Council of the Government and subsequently forwarded to the Council of State (Conseil d'État) for its formal opinion. If the opinion is favorable, the act may be adopted by signature of the responsible Ministers and the Grand Duke. The act enters into force wither upon publication or on a specific date explicitly stated within the regulation.

The Ministers who signed the act are responsible, each within his field of competence, for its execution.
To ensure the effective independence of the DRP as a regulatory body, the Luxembourgish government issued a national declaration in 2021 reaffirming this principle. [21]

Overview of the International Conventions and bilateral agreements

Luxembourg has ratified all international conventions relevant to nuclear safety and has concluded several bilateral agreements. The corresponding ratifying acts are listed in the appendix. Although not directly related to the CNS, it is worth noting that Luxembourg has not ratified the conventions on nuclear liability.

The most significant bilateral agreement was signed with **France** on 11 April 1983, concerning the exchange of information in the event of an incident or accident that could have radiological consequences. [1] This agreement includes the following main provisions:

- Immediate mutual information in case of incidents or accidents occurring in either country's territory that could affect the other state's territory radiologically.
- Establishment of a 24/7 information system.
- Definition of a standard set of key information to be exchanged.
- Provisions for the exchange of liaison officers in the context of implementing the intervention plan.

To manage all the bilateral questions related to nuclear safety, a Franco-Luxembourgish Commission was established in 1994. [16] This Commission meets annually, with the 23rd meeting held on 13 June 2025 in Paris. Further information concerning the exchange of information in case of a French nuclear or radiological emergency is provided under Article 16.3

Additionally, on 28 April 2024, the Government of the Grand Duchy of Luxembourg and the Government of the Kingdom of **Belgium** concluded a bilateral agreement regarding the exchange of information in case of an incident or accident with potential radiological consequences. This agreement was ratified in Luxembourg on 27 April 2006 by law. After minor adaptations the agreement is now re-ratified by Belgium (29 November 2024) and Luxembourg (20 December 2024) by law. [15]
On 14 May 2013, the Belgian Minister of Home Affairs and the Luxembourgish Minister of Health signed on behalf of their respective governments, a cooperation agreement on nuclear safety and radiation protection. [17] This agreement established the Belgo-Luxembourgish Commission on nuclear safety and radiation protection which is mandated to meet annually to discuss issues of mutual interest. The 11th meeting of the Commission was held on 3 April 2025 in Luxembourg.

Guides issued by the RB

To date, the DRP has issued guidance documents only in relation to regulatory supervision in the non-nuclear sector (see also Article 10).

7.2 (ii) System of Licensing

Overview of the licensing system including types of licensed activity and the procedure for relicensing

The law of 28 May 2019 on radiation protection provides the legal framework for licensing activities involving ionizing radiation. Articles 40 to 43 of this law classify facilities based on a graded approach, while Article 44 defines the applicable licensing regimes and Article 45 defines the outlines the associated licensing conditions.
Facilities are classified into three classes:

- Class I includes facilities operating accelerators, X-ray generators used for sterilization, radioactive sources of IAEA category I, producers of radioactive sources, radioactive waste treatment facilities and radiotherapy centers.
- Class II covers facilities using or possessing radioactive substances exceeding by a factor of thousand the exemption limits established in Council Directive 2013/59/EURATOM. It also includes facilities involved in industrial radiography, interim storage of radioactive waste or medical exposures (excluding dental X-ray equipment without 3D imaging capability).
- Class III applies to facilities using or holding radioactive substances exceeding the exemption limits of Council Directive 2013/59/EURATOM, operating x-ray machines or other electron-accelerating devices above 30 kilovolts, or handling naturally occurring radioactive materials with concentrations greater than or equal to 100 Bq per gram.

Licenses are granted for a period between 1 and 10 years, depending on the facility and associated risks. Upon expiration, licenses are subject to a relicensing procedure. Additionally, any project proposing modifications that could alter the scope or conditions of an existing license must undergo a licensing procedure corresponding to the new facility classification.

Licensing process and involvement of the public and interested parties within the CP

The application for a license must be submitted to the Minister of Health for class I and II facilities, and to the Directorate of Health for class III facilities. The DRP is responsible for overseeing the licensing procedure and for carrying out the technical assessment of the application (Article 52). If deemed useful or necessary, the DRP may consult external experts or other relevant stakeholders to obtain additional opinions during the assessment process.
Public participation is specifically foreseen for Class I facilities, which are considered to pose higher potential risks. As outlined in Article 48, the licensing procedure for such facilities includes a public consultation process, which is conducted in the municipalities, where the proposed facility is to be located.
The licensing decision is ultimately taken based on the opinion issued by the DRP.

Legal provisions to prevent the operation of a nuclear installation without a valid license

The law of 28 May 2019 establishes the general exclusion of nuclear installations. To avoid the development of a comprehensive legislative framework for an industrial sector that does not exist and is not anticipated in the future, the law explicitly prohibits the construction and operation of nuclear installation. This includes enrichment plants, nuclear fuel manufacturing

plants, nuclear power plants, research reactors, and installation for the processing, warehousing or storage of spent nuclear fuel (Article 35).

7.2 (iii) System of Regulatory Inspection and Assessment

The legal basis for inspections is established in Article 147 of the law of 28 May 2019 on radiation protection. This article designates officers of the DRP to perform inspections. These inspectors are empowered to access facilities during office hours, collect samples for examination, request relevant documents and gather necessary information on site.
An inspection program, supported by formal guidelines, procedures, and checklists, has been implemented to standardize the inspection process. The program outlines the different types of inspection and the defined inspection types include:

- Standard inspections, which focus on the control of radiation sources, compliance with licensing conditions, operational safety and occupational radiation protection measures.
- Thematic inspections, which provide in-depth assessments of specific areas. These inspections are supported by question sets checklists.
- Primary inspections are defined for new practices and final inspections can take place in the event of a definitive cessation of activities.
- Inspections may be either announced or unannounced, depending on the context and risk.

In accordance with paragraph 5 of Article 147, an inspection report is issued following each inspection. The report is sent to the head of the facility and, where applicable, to the employer of external workers. The report includes observations, identifies non-compliances and may set deadlines for corrective actions. In case of a more severe or safety significant non-compliances, enforcement measures are taken (see following chapter).

7.2 (iv) Enforcement

With the introduction of the law of 28 May 2019, the enforcement powers of the regulatory body were significantly strengthened, and a more graduated approach to enforcement was formally introduced.
Article 148 provides for administrative measures, granting the Minister of Health the authority to suspend or revoke licenses, whether partially or entirely, as well as to suspend or prohibit non-licensed activities.
Article 149 sets out the framework for penal sanctions. Officers of the DRP are vested with the legal powers of police officers, allowing them to seize objects, documents and other materials used or intended to be used in an offense committed. They are also empowered to report cases directly to the public prosecutor. In such instances, DRP officers operate under the authority of the prosecutor and are not subject to influence from any other body, including their own internal hierarchy.

Summary of Responses to Applicable Challenges and Suggestions

Challenge 1 from Joint 8th & 9th RM (Article 7)

➔ *Luxembourg should implement the IRRS action plan.*

The implementation of the IRRS mission action plan is considered complete. All 24 recommendations and 7 suggestions have been addressed and were primarily incorporated in the aforementioned law and its corresponding regulatory act of radiation protection adopted in 2019.

In addition to the legislative and regulatory act, a few actions were addressed but remain in continuous progress:

- the human resources plan is continuously under development (see Article 8);
- the formalization of the exercise program will be addressed in the context of the ongoing revision of the national nuclear emergency plan. (See Article 16.1)

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 fulfill 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.

8.1 Establishment of the Regulatory Body

Overview – Status, Missions, responsibilities and organizational structure

The executive competence in radiological safety and radiation protection in Luxembourg lies with the Minister of Health and Social Security. The Directorate of Health, which operates under the Ministry, is responsible for executing the decisions taken by the Minister. Within the Directorate, the Division of Radiation Protection (DRP) was established by the law of 21 November 1980 [2], which defines its missions and grants it the role of regulatory body. The DRP is entrusted with the protection against hazards of ionizing and non-ionizing radiation, nuclear safety, and the management of radioactive waste. Similar to other small countries, Luxembourg has centralized all competences in radiation and nuclear safety within this single division, combining both regulatory and technical expertise. The national laboratory for radiation physics (SAR) also forms part of the DRP. The organization chart and missions of each unit are presented in figure 2.

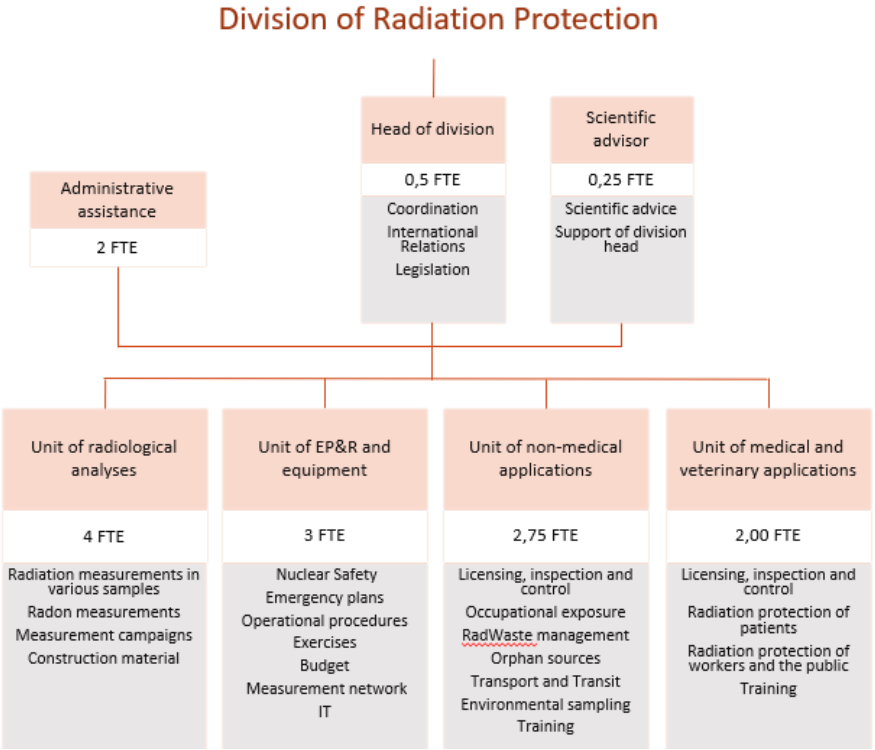

Figure 2: Organization chart and missions of the DRP.

Human resources

The DRP is composed of 10 agents (9 FTE) with master's degree, including 4 with PhD. Among them is one specialized in radiation protection, one nuclear physicist and two medical physics experts. The permanent staff of the DRP is further composed of one electromechanical engineer, 4 technicians (3 FTE), and two administrative positions.

In 2023, the DRP strengthened its human resources with the addition of an administrative coordinator and a PhD to reinforce the unit responsible for EPR and nuclear safety. The latter position was granted in conjunction with the nomination of the head of division as head of Department Health Protection. However, the Head of Division subsequently left the DRP, and no replacement was granted at that time. Since September 2024, one of the medical physics experts has assumed the role of Head of Division. This change resulted in a minor internal reorganization of responsibilities, although the overall missions of the DRP remain unchanged. The human resource situation in the laboratory (SAR) remains challenging, primarily due to long-term illnesses. To address this, two positions have been requested to reinforce laboratory capacity.

Adequacy of resources

The non-replacement of the former head of division, combined with the upcoming retirement of some of the most experienced staff, has highlighted the need for additional personnel to ensure the redundancy of critical regulatory functions. A request for additional staffing has been submitted. Furthermore, the issue of task redundancy within the DRP is currently under review in the context of national resilience planning, though no formal decision has been taken at this stage.

Maintaining competence

The DRP uses the training opportunities provided by the national institute of public administration (INAP), which offers programs to all public administrations in Luxembourg. These include both standard training (such as management) and specialized training on demand, such as sessions on laboratory accreditation and the application of ISO/IEC 17025. The legal basis for competence maintenance in the field of nuclear safety is defined in Article 137 of the law of 28 May 2019, which requires the DRP to monitor international developments, contribute actively to the international nuclear safety regime and ensure ongoing training of its staff. The principle of active international cooperation is also included in Article 116 concerning EPR.

A particularly important element in sustaining expertise in nuclear safety is the DRP's active involvement in international activities and expert networks. The professional exchange at forums, such as the CNS Review Meetings, Joint Convention, ENSREG, WENRA and HERCA provide significant value, especially for a small RB like the DRP.

Financial resources

All activities and projects of the DRP are financed through the state budget, with predefined annual allocations. A portion of these allocations is non-capped, allowing the DRP to cover unpredictable or emergency-related expenses, such as those arising from radiological incidents or accidents. In recent years, the DRP's budget has experienced annual increases ranging between 2% and 4%, reflecting national economic growth.

The DRP holds responsibility for the management and implementation of its allocated budget.

Quality management system

The Directorate of Health is currently in the process of establishing a quality management system with certification under ISO 9001 actively underway, which will firstly apply to the human resources service.

While the implementation of this system marks a significant step forward in terms of documenting processes, procedures, and records, it is acknowledged that the current structure does not yet fully integrate all requirements essential for ensuring nuclear and radiological safety in a coherent and systematic way.

The laboratory of the DRP (SAR), by contrast, has maintained a quality management system since 2010, and holds accreditation under ISO/IEC 17025. In accordance with this accreditation, the laboratory regularly participates in international inter-comparison exercises (IAEA ALMERA, JRC IRMM, etc.). Accredited techniques currently include gamma spectroscopy in liquids and gross alpha/beta measurements. The laboratory actively seeks to expand its scope of accredited methods as reflected in its annual audits.

Transparency and information of the public

Transparency is enshrined in Article 144 of the law of 28 May 2019, which mandates the regulatory body to ensure that information related to radiation protection, justification of practices, and regulation of ionizing radiation sources is made available to establishments, workers, patients and the public. It shall further inform the public in the areas of its competence.

The DRP's public communication is primarily facilitated through its dedicated Internet Portal www.radioprotection.lu. The portal provides information on all aspects of the DRP's mission, including relevant legislation, guidance for Radiation Protection Officers (RPO's), specific reports and environmental results and public information on emergency preparedness. The site is regularly updated and expanded. While content responsibility lies with the DRP, a department of the ministry manages the visual design and layout. The majority of the content is available in French and German, with selected documents, such as this CNS report, also published in English.

The DRP also ensures transparency of the CNS reporting process by publishing national reports and the questions and answers exchanged during the CNS review cycle on its website, immediately after their submission to the CNS restricted website.

External technical support

The facilities that exist in Luxembourg in the very most cases do not require any competence that is not available within the DRP. However, the DRP maintains the option to engage external technical support in well-justified cases. A dedicated and uncapped budget line allows for the engagement of such expertise when needed. This provision has, for example, been used to support the development and improvement of emergency preparedness and response procedures.

8.2 Status of the regulatory body

The DRP operates as a division within the Directorate of Health, which was established by the law of 21 November 1980. [2] Since its inception, the DRP has held the role as regulatory body for radiation protection within this organizational framework.
As part of a broader management system modernization, the Directorate of Health underwent an internal reorganization in 2022, resulting in the creation of thematic Departments. The DRP is now part of the Department health protection, alongside the Sanitary Inspectorate Division, the Health of Immigrants Unit and the Food Safety Division. It is worth mentioning, that the aforementioned law has not yet been formally updated to reflect these changes.

The DRP reports to the Minister of Health through the Director of Health. The Ministry of Health, which is the ministry of Health and Social Security since the last elections in 2023, is not involved in any energy policy matters, which fall under the responsibility of the Ministry of Economy. This separation ensures an effective and functional distinction between the DRP's regulatory oversight role, and any functions related to the promotion or utilization of nuclear energy. To further strengthen this independence, the Government of Luxembourg issued a national declaration in 2021, reaffirming the effective independence of the DRP as regulatory body. [21]

Article 9: Responsibility of the Licence 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.

Although Luxembourg is a Category 3 CP, it voluntarily reports on its implementation of the obligations under Article 9 of the convention.

The law of 28 May 2019 [13] clearly defines the license holder in Article 4 as a natural or legal person who bears the legal responsibility for a radiological practice. The law assigns explicit obligations to the license holder, ensuring clear accountability for the safety and regulatory compliance of their operations. Key responsibilities of the license holder include:

- Submitting a license application prior to the installation and operation of any radiological equipment (Articles 44);
- Ensuring the radiological protection of workers (Article 61);
- Guaranteeing the radiological safety of patients (Article 87);
- On-site emergency preparedness arrangements (Article 110);
- Radiological Safety of the public (Article 112);
- Safe management of radioactive sources (Article 130)

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.

Although Luxembourg is a Category 3 CP, it voluntarily reports on its implementation of the obligations under Article 10.

Luxembourg has laid down the basis for issuing requirements regarding safety policies of the license holder in the law of radiation protection from 28 May 2019 [13]. Article 45 of the law includes a list of issues that may be added in form of license conditions. Those issues comprise performance criteria, quality assurance programs and auditing.
In the field of medical exposures, the law contains additional specific provisions:

- Justification of medical exposures and the use of referral guidelines (Article 76 and 92)
- Arrangements for monitoring, self-assessment, external clinical audits and a minimum of one internal clinical audit per year (Article 95 and 96);
- Establishment of diagnostic dose reference levels (articles 97,98 and 99)
- Requirements for quality assurance programs (Article 101);
- Obligations to implement quality controls (Article 102);
- Use of equipment performance indicators (Article 103).

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.

Although Luxembourg is a Category 3 CP, it voluntarily reports on its fulfillment of the obligations Article 15.

Overview of the regulatory requirements and expectations

Articles 7, 11, 13 and 14 of the law of 28 May 2019 on radiation protection [13] establish the dose limits of the annual effective dose for exposed workers (including women of child-bearing age, apprentices and adult students) to 20 mSv. The working conditions for pregnant women must ensure that the equivalent dose to the unborn child does not exceed 1 mSv. Breastfeeding women are prohibited from working in areas bearing high risks of contamination. For apprentices and students aged 16 to 18 years who are obliged to use radioactive sources, the annual effective dose is fixed to 1 mSv. For members of the public, the maximum annual effective dose is set at 1 mSv.

Article 51 sets out provisions related to clearance and release from regulatory control. Clearance levels are established below which materials may be exempted from regulatory control. Any radioactive releases above those levels require prior licensing.

Articles 61 to 75 define operational requirements related to occupational exposures, covering the responsibilities of the license holder, the consultation with a radiation protection expert, classification of workers and zoning, individual monitoring, workplace surveillance, recording and reporting of results, as well as medical follow-up of exposed workers.

Articles 76 to 113 contain the operational requirements concerning the medical exposures, including the responsibilities of the license holder and the medical practitioner, the consultation a medical physics expert, justification, optimization, and quality assurance.

Implementation of radiation protection

According to the law of 28 May 2019 on radiation protection, any dosimetry laboratory needs to have an accredited quality assurance program in place.

The DRP previously operated its own internal dosimetry laboratory. However, following a five-year transition period after the law's entry into force, the DRP has formally discontinued this service in 2024. In the meantime, external dosimetry laboratories have been authorized a license to provide dosimetry services to several licensees and to the DRP itself. DRP continues to manage the National Dose Registry. In the event of an emergency, it is the responsibility of each administration to ensure the dosimetric surveillance of its personnel, including the provision of dosimeters.

At present, no license holder in Luxembourg produces radioactive discharges requiring licensing. Patients undergoing a therapeutic nuclear medicine procedures must be provided with written instructions for keeping doses to persons in contact with or in the vicinity of the patient as low as reasonably achievable and for avoiding the spread of contamination and

information on the radiation risks. The nuclear medicine departments performing Iodine therapy are required to install retention tanks with clear procedures for release.

Environmental monitoring

Luxembourg maintains a national program for the systematic monitoring and surveillance of radioactivity across its territory. This program ensures the continuous control of radioactivity in air, water and soil.

This National Radiological Monitoring Network includes an automatic measuring and warning network for the environmental radioactivity. The network provides a permanent surveillance of potential radioactive emissions from nearby nuclear installations and offers an early warning to the DRP in case of a radiological release. Most measurements from this network are automatically reported to the European Radiological Data Exchange Platform (EURDEP) and since 2024 as well to the national geoportal system managed by the Civil protection (CGDIS).

The monitoring network consists of Gamma dose rate monitoring stations, Aerosol sampling and water monitoring stations located across Luxembourg (see picture below). Most stations have been operational since the late 1980's and are subject to ongoing maintenance and periodic upgrades.

Recent infrastructure updates include the replacement of the high-volume aerosol sampling station near Luxembourg airport in 2025 and the relocation of the national water monitoring station to the new facilities of the SEBES water treatment plant in 2023.

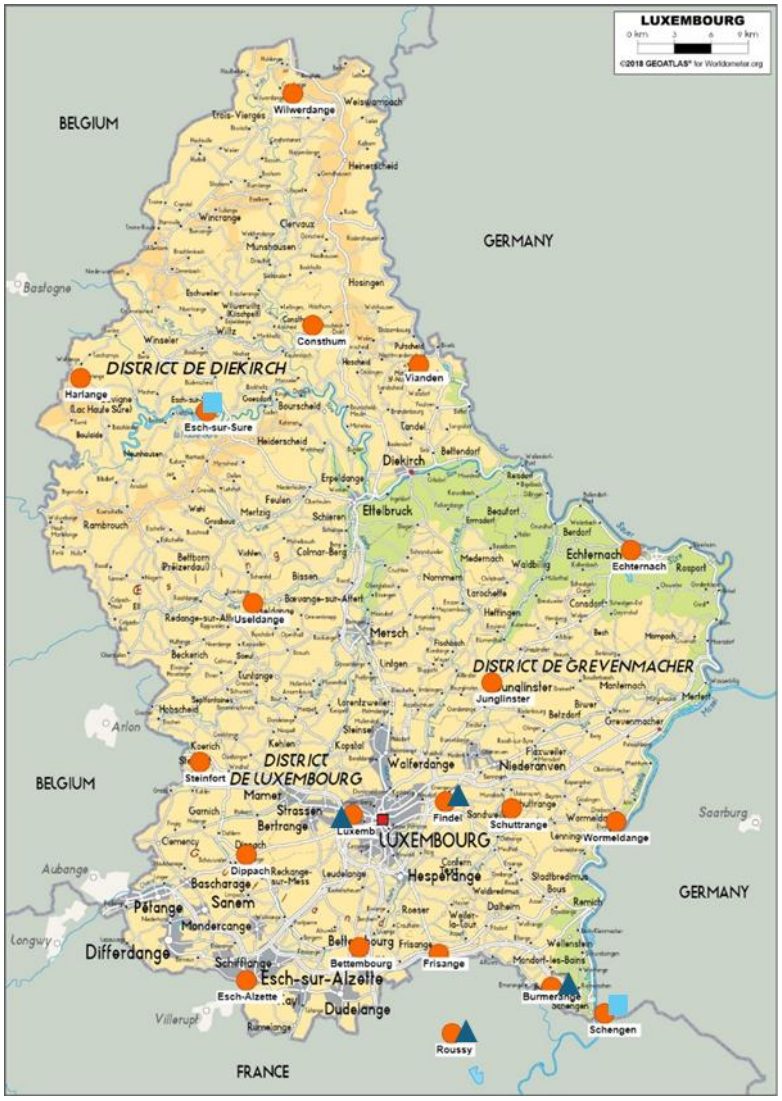

Figure 3: *National radiological monitoring network operated by the DRP, ● Gamma monitoring stations, ■ water monitoring stations, ▲ Aerosol sampler.*

In addition to automatic surveillance, environmental monitoring in Luxembourg includes the systematic collection and analysis of environmental samples, including samples from the food chain. These samples are analyzed by the accredited laboratory of the DRP (SAR).
Luxembourg operates one monitoring station located outside of its national territory, in Roussy-le-Village, France. This station is situated approximately halfway between the Cattenom NPP and the Luxembourgish border. Its operation is based on a bilateral agreement concluded in 1994 between the French and Luxembourgish authorities. [16]

Regulatory review and control activities

The DRP is responsible for assessing the radiation protection programs, and radiological risk assessments submitted by the licensees as part of the license application process. It further conducts inspections to verify, among other aspects, compliance with legal provisions related to radiation protection.

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.

Summary Statement for Article 16

As a Category 3 CP, Luxembourg continues to strengthen its EPR framework by revising the National Nuclear Emergency Plan, which will incorporate post-accident strategies and an update of OILs. In parallel, Luxembourg is developing a broader national resilience strategy. The LU-Alert system, a cell broadcast alert mechanism launched in 2024 improves public warning. In addition, the updated bilateral protocol with France (2025) strengthens cross-border coordination through annual joint exercises and improved information exchange. The expanded DRP on-duty service further reinforces national preparedness.

16.1 Emergency Plans

Sub-Article 16.1 does not apply to Luxembourg as a Category 3 CP, but voluntarily reports on this sub-article. Given the proximity of the Cattenom NPP in France, located only 8.5 km from the Luxembourg border, Luxembourg has adopted off-site emergency preparedness arrangements that are comparable to those required for CP operating nuclear installations. For this reason, the present report describes these elements below.

<u>Overview of the arrangements and regulatory requirements for off-site emergency preparedness</u>

The law of 28 May 2019 [13] establishes the main requirements related to nuclear and radiological emergencies, as follows:

- Definition of a reference level of 100 mSv for all exposures received by members of the public due to the emergency over a period of one year from the time of the accident, applying a maximum reference level of 20 millisievert for the existing exposure situation. The reference level for other existing exposure situations is fixed to 1 mSv per year (Article 9).
- Training and information for emergency workers (Article 32);

- License holder responsibilities for on-site emergency planning (Articles 61 and 114);
- Provisions for emergency exposures (Article 75);
- Requirements for off-site emergency planning (Article 115);
- International cooperation in emergency planning and response (Article 116);
- Public information (Article 117);

In particular, the above law stipulates that the Government in Council shall adopt the emergency plan, and that the Prime Minister with the Ministers of Home Affairs as well as Health and Social Security, shall be responsible for its elaboration and execution. It also states that exercises must be conducted at regular intervals and the plan is subject to annual review and revision.
The coordination of the crisis management during any crisis of national importance falls under the mission of the High Commission for National Protection (HCPN), as defined by the 23 July 2016 law establishing the HCPN. [12] The HCPN reports directly to the Prime Minister.

Among the 11 national emergency plans currently in place in Luxembourg, four national plans relate to nuclear or radiological emergencies:

- Emergency Response Plan (PIU) in the Event of a Nuclear Accident
- Emergency response plan in the event of chemical, biological, radiological or nuclear material attack (CBRN) not caused by an act of terrorism
- Government Mass Casualties Plan
- Emergency Response Plan in the event of a disruption in the drinking water supply

The PIU in the Event of a Nuclear Accident is the primary national plan concerning radiological and nuclear accidents and is particularly focused on the Cattenom NPP, while also applying to other potential radiological events. The original plan was fully revised after the Fukushima accident in 2014 (details see NR of 7. RM) and subsequently updated in 2019 (details see NR of 8. and 9. RM). [18]
The HCPN announced a full revision of this PIU end of 2024 aiming to enhance the plan's operability and the full implementation of GSR part 7.

The main revisions will focus on:

- Enhanced inter-administrative cooperation,
- Revision of the reception center planning and siren alerts,
- Inclusion of the post-accidental phase,
- Updating specific operational intervention levels (OILs),
- Consideration of incidents beyond the Cattenom NPP.
- Full integration of GSR part 7 elements, including:
  - Medical response management during nuclear or radiological emergencies,
  - Radioactive waste management (this issue is addressed by a recommendation from the ARTEMIS mission),
  - Mitigating non-radiological consequences.

To support these efforts, external experts are working with the DRP to implement required updates and to support inclusion of the post-accident strategies.

In May 2025, the Luxembourgish government announced the launch of work for its first national resilience strategy, which is expected to influence the structure and integration of all national plans.

Overview and implementation of main elements of the national plan for nuclear emergency preparedness, including the role and responsibilities of the regulatory body and other main actors, including State organizations

The PIU in the case of a nuclear accident [18] applies to all nuclear and radiological emergencies, with a primary focus on accidents involving the Cattenom NPP.

The responsibility for executing the plan lies with the Prime Minister and Minister of State, the Minister for Home Affairs and the Minister of Health and Social Security. All other ministries, agencies and departments of the State are required to cooperate using all the available resources, making local municipalities key partners in this.

A crisis cell is activated to coordinate and supervise the execution of all emergency measures and consists of high-level representatives from relevant ministries and administrations, including the head of the DRP. The Crisis Cell (CC) works closely with its foreign counterparts. The CC is supported by several operational and technical units:

- Common Operational Command Post (PCO-C)
- Advanced Command Post (PCA)
- Communication and Information Cell (CCI)
- Radiological Evaluation Cell (CER)

The CER is chaired by the DRP and includes members from both the DRP and the CGDIS. The main responsibilities of the CER include proposing protective actions to the Crisis Cell, monitoring the status of the affected reactor, assessing environmental radioactivity and its impact on the population. The members of the CER work closely with foreign counterparts (ASNR, FANC, European and international organizations) aiming to align recommendations across borders. Further information on this collaboration is explained under Article 16.3.

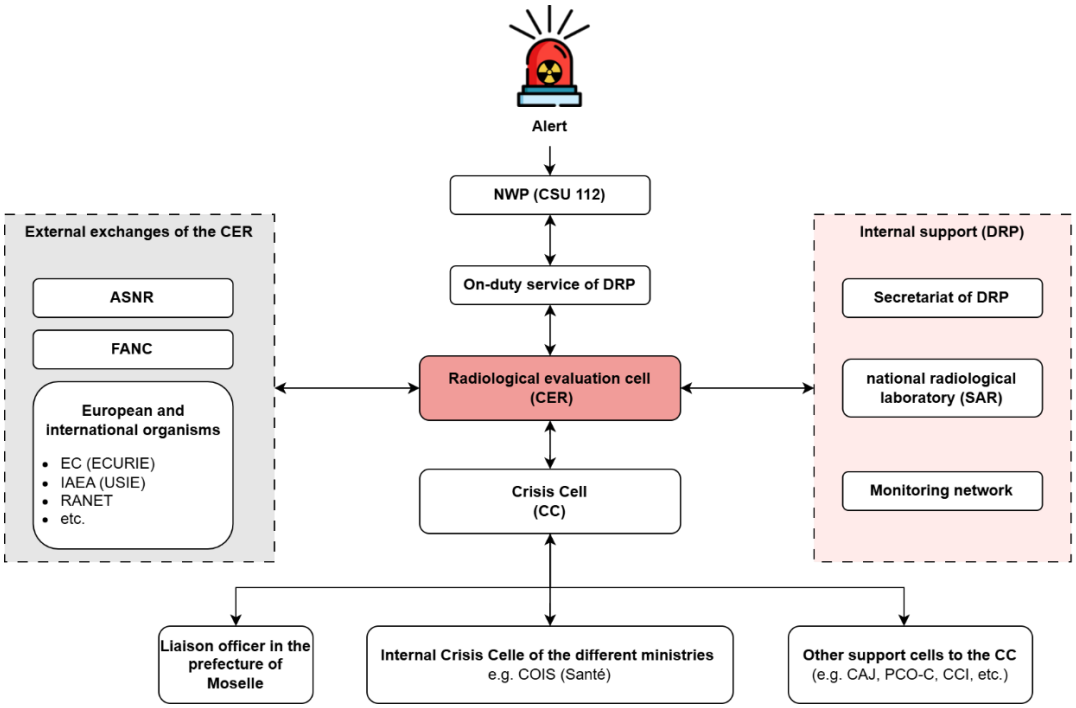

Figure 3: Alert and collaboration during a nuclear emergency - Focus on DRP tasks.

The figure above illustrates the alert and collaboration structure in the event of a major nuclear or radiological incident. As soon as a nuclear or radiological event is reported, the national warning point (CSU 112) receives the alert. CSU 112 immediately informs the on-duty service of the DRP, which proceeds with an initial evaluation of the available information and activates the Radiological Evaluation Cell (CER). If the incident is assessed to pose a potential radiological risk to the Luxembourgish population, the High Commission for National Protection (HCPN) is informed. After consultation with the DRP and the CGDIS, the High Commissioner for National Protection notifies the Prime Minister and Minister of State, who decides whether to activate the Crisis Cell (CC).
Following bilateral arrangements with France, the national warning point (CSU 112) as well as DRP and HCPN receive immediate alerts being sent by the French prefecture through their alert system, via predefined vocal messages.
The same system alerts the relevant French municipalities, and competent authorities of Rhineland-Palatinate (Germany), Saarland (Germany) in addition to Luxembourg. Upon activation, the Luxembourgish CC sends a liaison officer to the French Prefecture in Metz.

In the event of a confirmed emergency, the CC may issue public alerts via the national siren network and cell broadcast messages using the LU-Alert system, introduced in 2024 on national level.

The actual PIU distinguishes three phases of a nuclear emergency: threat phase, release phase and post-accidental phase.

The urgent protective action planning zone (UPZ) is defined as follows:

- 15 km radius around the Cattenom NPP for evacuation.
- 25 km radius around the Cattenom NPP for iodine thyroid blocking (ITB) and sheltering.

The UPZ is further divided into three alarm areas: East, Central and West. This separation allows targeted activation of sirens based on wind direction and the urgency of protective actions.
The extended planning distance (EPD) covers the remainder of the country. Key towns within this zone are designated to house the reception centers needed in the event of an evacuation. Provisions also exist for extending ITB and sheltering measures into this zone.
In line with the French post accidental strategy (CODIRPA) , the PIU defines two distinct zones for post-accident management:

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

The emergency response plan outlines four primary protective actions (see table below), and establishes further measures, including, restrictions or bans on outside activities, individual health measures, clothing, measures to prevent internal contamination and specific protocols for the river Moselle which borders France, Luxembourg and Germany and is used for navigation and drinking water supply.

Table 3: Generic Criteria and OILs for the main protective actions.

Protective Action	Generic criteria	OILs
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

The PIU defines two types of evacuation strategies: pre- and post-release evacuation (no evacuation under the cloud). Evacuation is combined with access control and reception centers will be established in the northern part of the country to host evacuees. The maximum duration of sheltering is set to 48 hours.

A preventive distribution of potassium iodide (KI) tablets to every resident of Luxembourg has been organized in 2014. Employers can request adequate KI stockpiles for their employees, aimed at covering cross-border commuters. New residents receive KI tablets when they first register with local authorities.
The previously established stockpiles and mechanisms are maintained:

- KI stockpiles are located in all municipalities within 25 km of Cattenom.
- KI stockpiles exist in all educational institutions, including nurseries.
- Parents of newborns receive KI tablets as part of pre-distribution efforts.

The main responsibilities of the RB (DRP) in the emergency response consist of:

- Participation in the CC;
- Presiding over and participating in the CER;
- Participation in the internal crisis cell of the Ministry of Health and Social Security;
- Providing scientific and technical advice to the CCI;
- Activating and operating the laboratory in emergency mode;
- Operating the National Radiological Monitoring Network;

Training and exercises, evaluation activities and main results of performed exercises including lessons learned

For over 20 years, biannual national exercises have been conducted, primarily aimed at training the specialized response units of the CGDIS.
Recognizing the limited national resources and technical expertise, Luxembourg focuses its efforts on participating at international exercises such as ConvEx and ECUREX. These simulations of emergency situations offer a higher level of complexity and realism, supporting mutual learning and coordination across all levels of response.
Luxembourg also participates in joint exercises with French and German counterparts, particularly involving the Cattenom NPP. These trilateral exercises, held every 3 to 5 years, involve the French authorities and the German federal states of Saarland and Rhineland-Palatinate.

The most recent "Cattenom" exercise, held on 11 May 2022, revealed that the existing information exchange protocols needed revision. As a result, the bilateral protocol was updated to address identified shortcomings. Further details of the revised protocol are provided under

Article 16.3. A key outcome of the updated protocol is the agreement to conduct joint exercises on an annual basis.

16.2 Information of the Public and Neighboring States

Luxembourg provides information to the public through several channels:

- The "LU-Alert" system is the new public warning and information system, using accessible technologies such as Cell Broadcast and location-based SMS. (Operational since autumn 2024)
- A crisis information website www.infocrise.lu, which provides information on:
  - Every possible national crisis, including nuclear or CBRN emergencies
  - General information on radioactivity and the nuclear sites located near the Grand Duchy of Luxembourg, available in German, French and English.
- Brochure "What to do in the event of a nuclear alert"
  - Available in German, French, Luxembourgish, English, Portuguese and in Easy Read German, as well as in Braille and audio format.
- Cell for crisis communication (CCI)
  - Is convened at the same time as the CC and the CER
  - Supports the CC while ensuring the functioning of internal communication chains. Itis presided by the director of the CCI, who acts as spokesperson, and may be assisted by experts if necessary
  - Coordinates communication between the authorities and the population during a nuclear crisis
  - Keeps the media and public informed of the evolving situation, including prescribed preventive and protective actions.
  - Several tools are used to facilitate this communication:
    - Traditional press releases,
    - The portal www.infocrise.lu, and
    - The free-phone hotline.
- The national siren system includes a specific siren signal for nuclear emergency. Upon hearing it, the public is instructed to tune in to the radio and follow the guidance issued by the authorities,
- Website www.radioprotection.lu
  - Provides general information on radioactivity
  - Includes a link to EURDEP
- National Warning point (CSU 112) communicates press releases from the Cattenom NPP

Luxembourg provides information to neighboring states primarily through ECURIE and USIE. Luxembourg has completed the self-assessment regarding EPR provided by IAEA (EPRIMS), including the HERCA EPR country fact sheet, the national emergency plan and the public information leaflet.

Bilateral agreements are in place to ensure effective information exchange in the event of a nuclear accident with the competent authorities of France and Belgium. (see articles 7.2(i) and 16.3)

16.3 Emergency Preparedness for Contracting Parties Without Nuclear Installations

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

HERCA-WENRA approach

Luxembourg's geographic situation, sharing borders with three neighboring countries, places it in a unique position regarding cross-border emergency planning. The DRP has long advocated for a harmonized European approach to nuclear emergency preparedness and response.
As a result, the DRP played a pivotal role in developing the HERCA-WENRA Approach (HWA). This framework provides a non-binding coordination mechanism that enables neighboring states to take consistent protective actions during a nuclear or radiological emergency. While not legally harmonizing preparedness arrangements across Europe, the HWA represents a pragmatic and operational tool for consistent response strategies across borders.
For Luxembourg, the HWA serves as the preferred framework for aligning its response strategies with those of neighboring countries. At the national level, Luxembourg's emergency arrangements are largely in line with the HWA's principles.

The implementation of the HWA is an ongoing process, particularly in cooperation with French authorities regarding scenarios at the Cattenom NPP. This requires dense and active collaboration, especially to harmonize recommendations in the early phase of an accident. This is the reason why there is a protocol in place for early exchange of information in case of a nuclear accident, which has recently been updated. [19] Please find further details below.

On-Duty Service

One of DRPs missions is the on-duty service in case of any radiological or nuclear emergency. Since 2023, the number of personnel assigned to the on-duty service has tripled to lighten the burden of each on-duty officer. The enhancement of the on-duty service comprises continuous training and internal procedures followed by regular exercises of all personnel.

International arrangements, including those with neighboring States
Bilateral agreements exist with France and Belgium, as explained under Article 7.

Besides the bilateral agreement with France (see Article 7) there are operational arrangements in place such as:

1. The alert of Luxembourgish authorities

At regional level, a dedicated communication system between the neighboring authorities has been established. Since 2023, the French prefecture of Moselle has been alerting the competent authorities in Germany and Luxembourg via the same alert system used to inform the affected French municipalities. The system is based on predefined vocal messages. On Luxembourgish side, these alerts are received by the national warning point (CSU 112), as well as by the HCPN and the DRP. Satellite phone alerts were integrated into the alert system in 2025.

Following such alerts, liaison officers from Rhineland-Palatinate (Germany), Saarland (Germany) and Luxembourg are invited to be present at the French prefecture in Metz. The mandate and role of these liaison officers are currently in the process of formalization.

A procedure is also in place to inform the Luxembourgish authorities in the event of an incident at the Cattenom NPP that could attract media attention, even if the situation does not constitute an actual accident.

2. Information exchange in case of a nuclear emergency

The protocol on information exchange during a nuclear emergency was established in 2015 between the French and Luxembourgish competent authorities, with the objective of coordinating protective actions along the border. [18]

This protocol has been under revision since the last Cattenom exercise in 2022, with the aim of streamlining the procedures for information exchange in the event of a nuclear emergency, as follows:

- Establishment of regular exchanges via videoconference, with the following objectives: (1) To gain a clear understanding of the technical situation at the accidented site, and (2) To be informed about proposed and implemented protective actions in order to coordinate cross- border actions;
- Annual testing of this arrangement. While the national exercise for the Cattenom NPP is conducted every three to five years, ASNR intends to use other national exercises to validate this information exchange arrangement annually.

The revision of the protocol was finalized in 2025, and the formal signing process by both parties is currently ongoing.

It is worth noting that, during the process, France and Luxembourg conducted several bilateral exchanges. Both countries invited each other to their respective crisis centers, and Luxembourg was invited to observe a French national exercise. This opportunity proved highly valuable for understanding the operations of the French crisis center and strengthened the bilateral collaboration.

At international level, Luxembourg is committed to using the international information exchange platform USIE, as well as the European system ECURIE, to facilitate communication between competent authorities at both European and international levels. This communication is regularly tested through participation in the respective exercises. (see Article 16.1)

Summary of Responses to Applicable Challenges and Suggestions

Challenge 2 from Joint 8th & 9th RM (Article 16)

➔ *Luxembourg should reorganize the radiological evaluation center, who performs nuclear and radiological assessment for nuclear emergencies. As well as updating its missions, procedures and tools and ensuring regular training and drills.*

Luxembourg has concluded that this challenge remains ongoing. The revision of the national nuclear emergency plan was announced by the HCPN at the end of 2024 and will include the update to missions, procedures and operational tools.

Annual training with the French authorities is ensured through the updated protocol on information exchange in the event of a nuclear accident.

Challenge 3 from Joint 8th & 9th RM (Article 16)

➔ *Luxembourg should update their procedures for information exchange for cross-border cooperation on emergency response in line with HERCA-WENRA Approach*

Luxembourg has updated the protocol on information exchange in the event of a nuclear or radiological emergency with its neighboring country France. The process of signature of the revised protocol is ongoing.

Challenge 4 from Joint 8th & 9th RM (Article 16)

➔ *Luxembourg should develop a strategy for the management of a post-accident situation.*

This remains a challenge and will be addressed during the revision of the national nuclear emergency plan. Key issues to be covered include enhancing the plan's operability, fully implementing the requirements of GSR part 7 and updating the OILs.

Summary of Significant Changes Since Previous Report

During the reporting period, Luxembourg has strengthened its emergency preparedness framework. The LU-Alert system, introduced in 2024, complements the national siren network and existing crisis communication tools, thereby improving public warning and information capabilities. In parallel, a new bilateral protocol with France on information exchange during nuclear emergencies is being finalized in 2025, reinforcing cross-border coordination.

Further developments include annual joint exercises with France, the preparation of Luxembourg's first national resilience strategy (2025), and the reinforcement of the on-duty service of the DRP including expansion of training efforts.

The revision of the National Nuclear Emergency Plan has been launched. This revision aims to streamline coordination with the relevant administrations, enhance of post-accident strategies and update the operational intervention levels (OILs).

APPENDIX

Annex A: References

Laws and regulations

1. Law of 28 March 1984 concerning the approval 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.
2. Law of 21 November 1980 concerning the organization of the Directorate of Health.
3. Law of 19 March 1997 concerning the approval of the Convention on Nuclear Safety, adopted in Vienna on 20 September 1994.
4. Law of 28 July 2000 concerning the approval of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, adopted in Vienna on 26 September 1986.
5. Law of 28 July 2000 concerning the approval of the Convention on Early Notification of a Nuclear Accident, adopted in Vienna on 26 September 1986.
6. Law of 20 June 2001 concerning the approval 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.
7. Law of 12 June 2006 concerning the creation of the rescue services agency.
8. Regulatory act of 3 March 2009 on the supervision and control of shipments of radioactive waste and spent fuel (transposition of Council Directive 2006/117/EURATOM of 20 November 2006).
9. 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.
10. 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.
11. Regulatory act of 16 December 2015 on the quality of water intended for human consumption.
12. Law of 23 July 2016 establishing a High Commission for National Protection.
13. Law of 28 May 2019 on Radiation Protection (Transposition of Directive 2013/59/EURATOM together with Regulatory Act from 1st August 2019).
14. Regulatory Act of 1 August 2019 on Radiation Protection.
15. Law of 20 December 2024 concerning the approval 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 Brussels on 29 March 2023.

Reports and other documents

16. Agreement of the 29 March 1994 between the government of the Grand Duchy of Luxembourg and the government of the French Republic on the installation of a measurement station and the organization of the bilateral cooperation on nuclear safety.
17. 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 Home Affairs, 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.
18. Emergency intervention plan in case of a nuclear accident (PIU), adopted by the Government in Council on 15 October 2014 (revision of that plan was adopted 15 May 2019).
19. Protocol of 15 January 2015 between French and Luxembourgish competent authorities on the exchange of information in the event of a radiological emergency.
20. IRRS Mission to Luxembourg, Final Report, 2018.
21. National declaration of the Government on radiation protection and nuclear safety, 3rd June 2021, Mémorial B N° 2255.
22. National Report for the 8th and 9th Review Meeting of the Convention on Nuclear Safety, 2022

Annex B: Acronyms, Abbreviations, and Definitions

Term	Meaning, Definition
ALARA	As low as reasonably achievable
ARTEMIS	Integrated Review Service for Radioactive Waste and Spent Fuel Management, Decommissioning and Remediation
ASN/ASNR	French Nuclear Safety Authority
CBRN	Chemical, biological, radiological of nuclear
CC	Crisis Cell (Cellule de Crise)
CCI	Communication and Information Cell (Cellule de Communication et information)
CER	Radiological evaluation cell (cellule d'évaluation radiologique)
CGDIS	Civil protection (Corps grand-ducal d'incendie et de secours)
CNS	Convention on Nuclear Safety
CODIRPA	French working group on the management of a post accidental phase (Comité directeur pour la gestion de la phase post-accidentelle d'un accident nucléaire)
ConvEx	Convention Exercises (Emergency drills and exercises within the framework of the Convention on Early Notification of a Nuclear Accident)
CP	Contracting Party
CSU 112	National Warning Point
DiSa	Directorate of Health (Direction de la santé)
DRP	Division of radiation protection within the Directorate under the Ministry of Health and Social Security (Regulatory Body)
EC	European Commission
ECUREX	European exercises using the platform ECURIE
ECURIE	European Community Urgent Radiological Information Exchange
ENSREG	European Nuclear Safety Regulators Group
EPD	Extended planning distance
EPR	Emergency Preparedness and Response
EPZ	Emergency Planning Zone
EU	European Union
EURDEP	European Radiological Data Exchange Platform
FANC	Belgian Nuclear Safety Authority
GSR part 7	IAEA General Safety Requirement: Preparedness and Response for a Nuclear or Radiological Emergency
HCPN	High commission of national protection (Haut-commissariat à la protection nationale)
HERCA	Heads of the European Radiological protection Competent Authorities
HWA	HERCA-WENRA Approach
IRRS	Integrated Regulatory Review Service (IAEA peer review)

ITB	Iodine Thyroid blocking
NI	Nuclear installation
NPP	Nuclear Power Plant
NR	National Report
NSD	Nuclear Safety Directive (Directive 2014/87/Euratom)
OIL	Operational Intervention Levels
PCA	Advanced Command Post
PCO-C	Common Operational Command Post
PIU	National Emergency Plan (Plan d'intervention d'urgence) in the event of a Nuclear Accident
RB	Regulatory Body (also referred to as DRP)
RM	Review Meeting
SEBES	Surface drinking water station
UPZ	Urgent Protective action planning Zone
USIE	Unified System for Information Exchange in Incidents and Emergencies
VDNS	Vienna Declaration on Nuclear Safety
WENRA	Western European Nuclear Regulators Association
ZPP	Public Protection Zone (Zone de protection de la population)
ZST	Reinforced Territorial Surveillance Zone (Zone de surveillance renforcée du territoire)