LUXEMBOURG

(based on JC national report)

a) National framework for management of spent fuel and radioactive waste

Luxembourg has no nuclear power plant, no other fuel cycle facility, no research reactor and no other facility generating radioactive substances. It further has no spent nuclear fuel and no high level radioactive waste on its territory. There are also other reasons, why the actual total amount of radioactive waste, mainly in form of disused sealed sources of low activity, is marginal:

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

In Luxembourg radioactive wastes are mainly arising from the use of radioactive sources in industry, medicine and to a small extent from the use in education and research. The Luxembourg radioactive waste management policy is dictated by the practical needs of the country. The low activity and volume of radioactive waste produced in the country are not justifying the implementation of a final waste repository on national territory. Therefore all disused sealed sources have to be returned to the country of origin and if this turns out to be impossible, to a foreign waste management facility.

The Luxembourg policy is based on the aim to avoid the production of radioactive waste, through the following provisions:

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

Radioactive waste is classified by the half-life of the corresponding nuclides and whether the disused sources are sealed or unsealed. Wastes resulting from these practices and containing short-lived radionuclides are stored on the user's premises until decay or until the activity of the waste decreased below the clearance levels. Wastes containing small specific activities below clearance level and not exceeding a total weight of 1000 kg may be treated the same way as conventional hospital waste.

b) National legal and regulatory framework

Luxembourg has legislation and regulation on radiation protection, which cover all relevant nuclear and radiological safety issues, since 1963. The regulatory decrees are revised periodically in order to be in conformity with the provisions of the Directives of the European Union of which Luxembourg is a Member State.

The legislative and 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 to all departments within the Directorate of Health.

Similarly to a number of other small countries, the DRP centralizes as a single department all competence of radiation and nuclear safety. The DRP is at the technical level in charge with the preparation of draft text for laws, regulations and decrees. These drafts are then submitted to the department of legal affairs of the Ministry of Health for coordination of the legislative procedure. The DRP also defines the conditions for licenses. It has further issued several guides.

c) Radioactive waste management, decommissioning and spent fuel strategy

Concerning the small quantities of radioactive waste arising in Luxembourg, the Belgian Government has exceptionally, and due to the small quantities, accepted to treat the waste coming from the Grand Duchy of Luxembourg, in Belgium.

A small location is operated by the DRP and collects radioactive sources for which no return to a supplier can be found. Once they are declared as radioactive waste, they are packed for transportation and temporarily stored until they will be sent to an abroad storage or disposal facility.

Table 1 Radioactive Waste In Storage (including spent fuel that is considered waste)

Route Waste Class	Processed (type)/Un processed	Total Current Volume (m3)	Estimated Disposal Volume (m3)	Distribution (%)							Planned Disposal Route (if known)
				RO	FFE	RP	NA	DF	DC/ RE	ND	
All Classes		0									
All Classes		0									

NEWMDB waste origin type codes:
RO – reactor operations
FFE – fuel fabrication & enrichment
RP – fuel reprocessing
NA – nuclear applications
DF - defence
DC/RE - decommissioning & remediation
ND - Not Determined

Table 2 Radioactive Waste Disposed (as disposed volume)

Waste Class	Processed (not)	Total Volume (m3)	Distribution (%)							Disposal Route Used
			RO	FFE	RP	NA	DF	DC/RE	ND	
All Classes		0								

Table 3 Spent fuel in Storage (MTHM)

Type	Current Amount (NPP)	Current Amount (Research Reactors)
Total Spent Fuel Storage	0	0
Wet storage (AR)	0	0
Wet storage (AFR)	0	0
Dry storage (AR)	0	0
Dry storage (AFR)	0	0
Total spent fuel held in storage for other countries (amounts also included above)	0	0

Table 4 Spent fuel sent for reprocessing (in the country or sent to another country) (MTHM)

Type	Current Amount (NPP)	Current Amount (Research Reactors)
Total amount Spent Fuel sent to Reprocessing (in your country)	0	0
Total amount Spent Fuel sent to	0	0

Reprocessing (in another country)		
Total amount of Spent Fuel received from another country for reprocessing and recycling	0	0
Total amount of Spent Fuel (MTHM) or radioactive waste (cubic metres) returned to country of origin for storage/disposal	0	0

Table 5 Example of a translation matrix (from NEWMDB) that can be used for transition from a national classification system to IAEA classification

National Waste Classification Name	**VLLW**	**LILW**	**ILW**	**HLW**

Table 6 Waste management facilities

Type	**Planned**	**Construct.**	**Commiss.**	**In Operation**	**Shutdown**	**Decomm.**	**Other**	**Total**
Spent Fuel Storage	0	0	0	0	0	0	0	
Spent Fuel Reprocessing and Recycling	0	0	0	0	0	0	0	
Spent Fuel Conditioning	0	0	0	0	0	0	0	
Spent Fuel disposal	0	0	0	0	0	0	0	
Waste processing	0	0	0	0	0	0	0	
Waste storage	0	0	0	0	0	0	0	
Waste disposal	0	0	0	0	0	0	0	

Table 7 Summary of major sources of waste

Type	**Planned**	**Construct**	**Commiss.**	**In Operation**	**Shutdown**	**Decomm.**	**Other**	**Total**

Research reactors	0	0	0	0	0	0	0	0
Nuclear Power reactors	0	0	0	0	0	0	0	0
Spent Fuel Reprocessing and Recycling	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0

Table 8 Future prospects

Type	**Current amount**	**Estimated Current amount when prepared for disposal**	**Current Disposal Capacity**	**Total forecast at 2030**	**Disposal Capacity 2030**	**Total forecast at 2050**	**Disposal Capacity 2050**
Spent Fuel Storage	0	0	0	0	0	0	0
Wet storage (AR)	0	0	0	0	0	0	0
Wet storage (AFR)	0	0	0	0	0	0	0
Dry storage (AR)	0	0	0	0	0	0	0
Dry storage (AFR)	0	0	0	0	0	0	0
Total amount Spent fuel sent to Reprocessing and Recycling	0	0	0	0	0	0	0
Total amount Spent fuel disposed	0	0	0	0	0	0	0
Waste in storage	0	0	0	0	0	0	0
Waste disposal	0	0	0	0	0	0	0