PORTUGAL

(based on JC national report)

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

Portugal has no nuclear power plants but produces radioactive waste from medical, industrial and research applications of radioactive materials in the form of sealed and unsealed sources, as well as spent fuel from the only existing nuclear reactor in the country, the Portuguese Research Reactor (RPI), which is a pool-type research reactor (1 MW).

In Portugal, radioactive waste originates mainly from medicine, industry and research activities. Only low level and intermediate level radioactive waste is produced from activities in these sectors. Instituto Superior Técnico (IST) is responsible for the collection, segregation, conditioning and storage of solid and liquid radioactive waste produced in the country. IST, under the regulatory oversight of Regulatory Commission for the Safety of Nuclear Installations (COMRSIN), is responsible for the safe management of all radioactive waste stored in its elimination facilities. However, concerning medical applications and nuclear medicine, Decree-Law 180/2002 of August 8th, establishes that solid and liquid radioactive waste with a short half--life may be stored by the owner until it decays or gets discharged.

Despite the fact that a permanent solution to this elimination facility should be a national priority, no political decision has been taken about it yet, nor is it foreseen for the near future. In order to look for possible disposal sites for this type of waste (surface and near-surface facilities) academic studies have previously been carried out by Nuclear and Technological Institute (ITN) and the Universities of Lisbon, Porto and Évora, with the support of the Foundation for Science and Technology (FCT). However, these studies were not implemented.

With the publication of Decree-Law 156/2013 of November 5th, there is a defined policy on radioactive waste management in Portugal based on fundamental principles.

b) National legal and regulatory framework

Portugal has complied with its obligations under EU primary and secondary legislation relating to safety requirements and radiation safety. Since Portugal's accession to the EU in 1986, a number of legal acts have been adopted, and many have continued to be in force.

Presently, the authorities with responsibilities in radiological protection, radioactive waste management, spent fuel, nuclear safety, transportation of radioactive materials, preparedness and emergencies are the following:

- Regulatory Commission for the Safety of Nuclear Installations (COMRSIN);
- Directorate-General of Health (DGS);

- Instituto Superior Técnico (IST);
- Portuguese Environmental Agency (APA);
- Directorate-General of Energy and Geology (DGEG);
- National Civil Protection Authority (ANPC);
- Regional Directorates of Economy (DRE);
- Regional Health Authorities (ARS).

Under Decree-Law 30/2012, of February 9th, the Regulatory Commission for the Safety of Nuclear Installations (COMRSIN) was created, leading, for the first time in Portugal, to the existence of an independent regulatory body for nuclear safety. The Prime Minister appointed three Commissioners for a five-year term. In 2013, with the publication of Decree-Law 156/2013 of November 5th, the attributions of COMRSIN were broadened to include the regulatory oversight of the safe management of spent fuel and the safe management of radioactive waste as well as the safe transportation of spent fuel and radioactive waste.

c) Radioactive waste management, decommissioning and spent fuel strategy

The low enriched uranium (LEU) which started being used in the RPI in 2007 was enriched in the USA and is eligible for return to this country before 2019. Alternatively, it may be reprocessed, with ILW being returned at a later time. The National Program for the safe management of the spent fuel and radioactive waste, prepared in the framework of Council Directive 2011/70/EURATOM foresees both options but still awaits government approval. Portugal does not have HLW and does not require any activities concerning handling or storage of spent fuel, other than interim storage of spent fuel in the pool before shipment to the country of origin or for reprocessing.

The cost associated with the collection and elimination of radioactive waste by IST, including spent sealed sources, has been set according to radionuclide, activity, and volume as defined in ITN's Directive Board Order no. 14641/2005. Under Decree-Law 156/2013, a new set of rules and prices have been adopted for the classification, collection and elimination of radioactive waste, as defined by the Ministerial Order nº 891/2015.

All the solid radioactive waste received from private and public entities from across the country is stored in the IST's elimination facility, after appropriate segregation and conditioning is carried out. This is a surface facility that for many years has been used as interim storage for the elimination of radioactive waste in Portugal.

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		265		2			98				
All Classes											

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**
IAEA		234 m3	31 m3	

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	1	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	1	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						
Wet storage (AR)	0						
Wet storage (AFR)	0						
Dry storage (AR)	0						
Dry storage (AFR)	0						
Total amount Spent fuel sent to Reprocessing and Recycling	0						
Total amount Spent fuel disposed	0						
Waste in storage	265						
Waste disposal	0						