Czech Republic

(based on JC national report and NEA country profiles)

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

In compliance with internationally acknowledged principles, the Atomic Act requires that the radioactive waste generator bear all the costs of radioactive waste management from production to disposal of such waste, including the cost of monitoring repositories after their closure and the cost of the associated research and development. The processing of radioactive waste for disposal is paid for by the generator in the form of direct payments to specialist organizations – licence holders that carry out such activities on the generator's behalf. Radioactive waste disposal and spent nuclear fuel disposal are the responsibility of RAWRA. The generator pays for these services in the form of payments to a nuclear account.

The nuclear account is controlled by the government and nuclear account funds may only be used through RAWRA for tasks specified in the Atomic Act. The distribution of nuclear account funds and amounts and methods of waste generators payments are stipulated by certain government decrees. RAWRA administers payments to the nuclear account and prepares documentation on the level of payments.

Individual RW generators contribute into the nuclear account depending on the character and amount of waste being disposed. The level of payments required to cover these costs are determined according to relevant methodology in compliance with current government decree, either in the form of one-off payments or regular installments.

The costs of design, construction, operation and closure of a deep geological repository as well as the cost of spent nuclear fuel conditioning into a form suitable for disposal, and that of high-level waste or spent nuclear fuel disposal itself, are settled by regular installments from SF generators.

The following is crucial for RAW and SF management:

- adherence to a legal framework which does not permit any developments in RAW management which would be inconsistent with the requirements for the protection of people and the environment,
- guaranteed compliance with and enforceability of legal regulations,
- clear specification of the basic responsibilities of all legal entities and persons involved in RAW management,
- comprehensive coverage of all activities that might give rise to RAW or SF and the maintaining of a survey of such materials.

RAW and SF management in the Czech Republic is the responsibility of authorized private entities and SÚRAO and, if needed, the Authority will also provide extended services for the generators. The disposal of low and intermediate level waste in the Czech Republic lies in their safe disposal in the existing near-surface disposal facilities whose economical operation has been continuously evaluated and optimized. One of disposal alternatives for long-lived low and intermediate level waste and high-level waste is the use of DGR; before its commissioning, these materials will be stored at their generators or in facilities of the Authority.

The Policy does not anticipate reprocessing of SF produced by operation of power generating reactors in the Czech Republic. The use of SF reprocessing technologies is justified as long as its economic or safety benefits have been proved. In agreement with the Atomic Act, radioactive waste is defined as „substances, objects or equipment containing or contaminated by radionuclides for which no further use is foreseen“.

SF shall not be considered radioactive waste under the Atomic Act unless it has been declared as radioactive waste by its owner, or by SÚJB. SF storage shall be subject to the requirements equal to RAW before disposal and SF shall be stored so that its further treatment is not impeded.

Generators of Radioactive Waste and Spent Nuclear Fuel are responsible for RWM at their premises and for its conditioning prior its disposal. They shall allocate to their own debit financial provisions to the Nuclear Account to cover expenses for disposal of radioactive waste which have been arising or will arise and for associated activities of RAWRA.

b) National legal and regulatory framework

The Act No. 18/1997 Coll., as amended (the Atomic Act), set forth the conditions for peaceful utilization of nuclear energy and ionizing radiation, including activities subject to license from SUJB. Other provisions of the Atomic Act define:

- conditions for a license issue,
- probity and professional competence of the applicant for a license,
- content and particulars of a license application,
- SUJB conduct in the administrative proceedings,
- license requisites,
- alteration, cancellation and cessation of a license.

The Czech Government and State Authorities in general are responsible for development and implementation of the legislative framework and the state policy in the field of radioactive waste management which should be in compliance with the international commitments. The State Office for Nuclear Safety is responsible for nuclear safety and radiation protection supervision and for development of legal regulations in the field of nuclear energy use and radioactive waste management. Gives permits for siting, construction, operation and closure of the repositories as well as for RW management in general. The Atomic Act, together with the Act No. 552/1991 Coll., on state supervision, provide SUJB with sufficient powers to execute the state supervision,

as well as coercion means to enforce the compliance with legal requirements for nuclear safety and radiation protection. SUJB performs supervision of compliance with the Atomic Act and other regulations issued.

c) **Radioactive waste management, decommissioning and spent fuel strategy**

In accordance with the Decree No. 307/2002 Coll., on radiation protection, RAW is categorized as gaseous, liquid and solid waste. Solid RAW are further divided into three basic classes: temporary, low- and intermediate- and high-level radioactive waste.

- temporary RAW are waste in which radioactivity after long-term storage (up to 5 years) is lower than clearence levels,
- low- and intermediate-level waste are divided into two sub-groups: short-term waste with the radionuclide half-life (including 137Cs) less than 30 years and with limited mass activity of long-term alpha sources (per cask up to 4000 kBq/kg and the mean value 400 kBq/kg for the total volume of waste produced in one calendar year), and long-term waste that include those not classified in the “short-term“ RAW sub-group,
- high-level waste require storage and disposal considering the heat released from decay of radionuclides contained therein.

LILW-SL represents the highest volume of radioactive waste generated. It arises in liquid or solid form during the operation and decommissioning of nuclear reactors, and during the use of radioactive sources in health-care, research and industrial applications.
LILW-LL appears to a lesser extent and a great majority of such waste cannot be accepted by currently operated near-surface repositories. Requirements for the method and quality of processing for storage and subsequent disposal in a DGR will be stipulated for this waste at a later date. The method of processing and treatment of such radioactive waste is well-known and used commercially; hence the issue of implementation is more a time and financial rather than a technical issue. For the time being, waste of this kind is mainly stored unprocessed at the generators, and small amount is being stored by RAWRA.

According to the Atomic Act, spent nuclear fuel is not considered to be waste until it is declared as such by its owner or by the State Office for Nuclear Safety. The company that operates the nuclear power plants in the Czech Republic is CEZ, which has adopted the open nuclear fuel cycle concept. Under this concept, SF is not reprocessed for recovery of reusable material, but is stored at the premises of the NPPs. For this reason, the management of HLW from SF reprocessing is not currently an issue of direct concern.

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	No	772	772	271	0	0	22	0	479	0	
All Classes	Yes	2106	2106	2016	0	0	57	0	33	0	
LILW-LL	No	4	4	0	0	0	3	0	0	0	
LILW-LL	Yes	11	11	0	0	0	11	0	0	0	
LILW-SL	No	768	768	270	0	0	19	0	479	0	
LILW-SL	Yes	2094	2094	2016	0	0	45	0	33	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	No	1083	1051	0	0	32	0	0	0	
All Classes	Yes	7776	4668	8	0	3108	0	0	0	
LILW-LL	Yes	317	0	0	0	317	0	0	0	
LILW-SL	No	1083	1051	0	0	32	0	0	0	
LILW-SL	Yes	7128	4668	0	0	2461	0	0	0	
TRW	Yes	330	0	0	0	330	0	0	0	

Table 3 Spent fuel in Storage (MTHM)

Type	Current Amount (NPP)	Current Amount (Research Reactors)

Total Spent Fuel Storage	1649 tonnes HM	
Wet storage (AR)		
Wet storage (AFR)		
Dry storage (AR)		
Dry storage (AFR)		
Total spent fuel held in storage for other countries (amounts also included above)		

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

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	LLW	ILW	HLW
TRW		100%		
LILW-SL		100%		
LILW-LL			100%	
HLW				100%

Table 6 Waste management facilities

Type	Planned	Construct.	Commiss.	In Operation	Shutdown	Decomm.	Other	Total
Spent Fuel Storage				4				
Spent Fuel Reprocessing and Recycling								

Spent Fuel Conditioning								
Spent Fuel disposal								
Waste processing								
Waste storage				6				
Waste disposal				4				

Table 7 Summary of major sources of waste

Type	**Planned**	**Construct**	**Commiss.**	**In Operation**	**Shutdown**	**Decomm.**	**Other**	**Total**
Research reactors	0	0	0	3	0	2	0	5
Nuclear Power reactors	0	0	0	6	0	0	0	6
Spent Fuel Reprocessing and Recycling	0	0	0	0	0	0	0	
Other								

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	1649		4434				
Wet storage (AR)							
Wet storage (AFR)							
Dry storage (AR)							
Dry storage (AFR)							
Total amount Spent fuel sent to							

Reprocessing and Recycling							
Total amount Spent fuel disposed							
Waste in storage	2878		5768				
Waste disposal	8859		66290				