BOSNIA AND HERZEGOVINA

(based on JC national report)

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

Bosnia and Herzegovina is a country that has no nuclear power plants, nuclear research reactors and uranium mines, nor in the near future plans to build them. Radioactive materials (sealed and unsealed) are used in medical, industry and research activities. Significant number of old lightning rods with sealed radioactive sources installed on various buildings.

There is established regulatory framework for safe management of RWM. For the implementation of measures and activities regarding the RWM, including collection, transport, packaging, handling, conditioning, storage and final disposal shall be performed by the holder of authorization.

The authorization holder generating RW shall be responsible for the implementation of measures with the aim of generating minimal amounts of radioactive waste and no radioactive waste shall be imported in BiH.

Centralized RWM is one storage facility, which is owned by the state and it has appropriate type and design suitable for all institutional and non-institutional waste. It is foreseen that RW generated by previous practices will be collected in Central Storage Facility for conditioning and storage. Generators of the radioactive waste will pay fees for storage of radioactive waste. The country is exploring the options of sending/exporting DSRS for recycling to adequate facilities abroad. Otherwise the possibilities of disposal in the country will be assessed.

b) National legal and regulatory framework

The legal and regulatory framework was originally established within the framework of the Former Yugoslavia more than 50 years ago. Since the declaration of independence in 1992, different organizational structures were in place for the control of radiation sources, but without good results in practice. The Law on Radiation and Nuclear Safety in Bosnia and Herzegovina is in force since year 2007 and the Policy on the safety and security of sources of ionizing radiation from 2012. Strategy on RWM published in January 2014

The functions of established State Regulatory Agency for Radiation and Nuclear Safety (SRARNS) include:

- Define the policy in the field of radiation safety and nuclear safety, the principles of safety, and appropriate criteria as the basis for its regulatory actions;
- Prepare and issue regulations and instructions, which constitute the basis for its regulatory action;

- Define radiation exposures excluded from the scope of regulations, based on the fact of those not being the subject of regulatory control;
- Define and implement procedures for notification, authorisation, inspection, enforcement of regulatory requirements;
- issue, amend, suspend or deprive, and set the terms for authorizations for import, export, production, purchase, receipt, possession, storage, usage, transit, transportation, maintenance, recycling and final disposal, as well as any other activity with sources of ionizing radiation

c) Radioactive waste management, decommissioning and spent fuel strategy

Until 1992, all RW and DSRS were sent to Vinca institute, former Yugoslavia, today in Serbia. There is one operational temporary storage facility operated by Institute for Public Health FBiH. There is also another temporary storage, which is out of operation and additionally 6 interim storages at users‘ premises.

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		5 (*)	Depends of route selected, could be borehole				100				unknown
All Classes		3 (**)	3				100				unknown

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

(*) this includes 5 m3 of sealed sources together with shielding storage containers, after their repacking and conditioning (this is approximation, as sealed sources are mainly in original working containers)

(**) this includes 2 m3 of deleted uranium and 1 m3 of conditioned Ra-226 waste

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	0	0

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)	0	0
Total amount Spent Fuel sent to Reprocessing (in another country)	0	0
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	0
Spent Fuel Reprocessing and Recycling	0	0	0	0	0	0	0	0
Spent Fuel Conditioning	0	0	0	0	0	0	0	0
Spent Fuel disposal	0	0	0	0	0	0	0	0
Waste processing	0	0	0	0	0	0	0	0

Waste storage	1	0	0	7	1	0	0	8 (*)
Waste disposal	0	0	0	0	0	0	0	0

(*) All storages in operation and shutdown will be decommissioned after a planned new facility is commissioned and in operation.

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	
Wet storage (AR)				0		0	
Wet storage (AFR)				0		0	
Dry storage (AR)				0		0	
Dry storage (AFR)				0		0	
Total amount Spent fuel sent to Reprocessing				0		0	

and Recycling							
Total amount Spent fuel disposed				0		0	
Waste in storage	8		0	15	0	15	0
Waste disposal				0		0	

Total forecast at 2030 volume includes additional 2 m3 of currently installed and used sealed sources after their repacking and conditioning; as well as approximately 5 m3 that could arise in process of decommissioning currently operational storage facilities. This volume could arise much earlier than 2030.