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ADDENDUM TO THE "I" ITEM NOTE

from :	the General Secretariat of the Council
to :	COREPER
Subject :	Report on Nuclear Safety in the Context of Enlargement

Delegations will find attached the Addendum to the report on nuclear safety in the context of enlargement. This addendum comprises the following appendices:

APPENDIX 1 Summary descriptions of installations and the legal, regulatory and organisational framework in Candidate States

APPENDIX 2 Status of Candidate States and Member States vis-à-vis selected international agreements

APPENDIX 1

SUMMARY DESCRIPTIONS OF INSTALLATIONS AND THE LEGAL, REGULATORY AND ORGANISATIONAL FRAMEWORK IN CANDIDATE STATES

Overview of the basic designs of Nuclear Power Reactors in the Candidate States

Reactor type	Main process	Country of design	Start of construction[1]	Design life time	Operating country (units)
VVER-440/230	6-loop Pressurised Water Reactor	Soviet Union	1970-74	30 years	Bulgaria (4) Slovakia (2)
VVER-440/213	6-loop Pressurised Water Reactor	Soviet Union	1974-83	30 years	Czech Rep (4) Hungary (4) Slovakia (4)
VVER-1000/320	4-loop Pressurised Water Reactor	Soviet Union	1980-87	30 years	Bulgaria (2) Czech Rep (1+1)
RBMK 1500	Graphite Moderated Pressure tube Reactor	Soviet Union	1977-78	30 years	Lithuania (2)
CANDU 6	Heavy Water Channel Reactor	Canada	1980	30 years	Romania (1)
Westinghouse	2-loop Pressurised Water Reactor	USA	1974	40 years	Slovenia (1)

BULGARIA

Installations

Power reactors

On the site at Kozloduy, Bulgaria has in operation six nuclear power plants operated by the state owned company Kozloduy NPP. The licensing authority is the Inspectorate on the Safe Use of Atomic Energy (ISUAE).

NPP unit	Reactor type	Start of construction	First grid connection	End of design life
Kozloduy 1	VVER-440/230	1970	1974	2004
Kozloduy 2	VVER-440/230	1970	1975	2005
Kozloduy 3	VVER-440/230	1973	1980	2010
Kozloduy 4	VVER-440/230	1973	1982	2012
Kozloduy 5	VVER-1000/320	1980	1987	2017
Kozloduy 6	VVER-1000/320	1984	1991	2021

At Belene, construction of two VVER-1000/320 units was started in the 1980's but the work was frozen in 1990.

[1] In Candidate States

Research reactor

Bulgaria has one Soviet-designed pool type research reactor IRT-2000 at the Institute of Nuclear Research and Nuclear Energy (INRNE) of the Bulgarian Academy of Science (BAS) in Sofia. It went critical in 1961 and has a rated thermal power of 2000 kW. The reactor is presently shut down. Its future is presently under discussion, the two main options being decommissioning of the reactor or additional construction work with further operation at zero power. The licensing authority is the Inspectorate on the Safe Use of Atomic Energy (ISUAE). The fuel assemblies have been transferred from the core into the AR wet storage as a preparatory process for reconstruction and modernisation.

Spent Fuel Facilities

Kozloduy NPP

UNITS	SF elements/a	No. in storage (end '99)	Storage type	Remarks
1-4 (VVER-440)	~ 430	963 3134	AR, Wet AFR, Wet	Almost full VVER-440 fuel
5-6 (VVER-1000)	~ 109	756	AR, Wet	

The SF from Kozloduy NPP was returned to the former USSR until 1989 when the USSR unilaterally terminated the co-operation. However, a reprocessing contract has recently been concluded with Russia for reprocessing of VVER-440 SF, though this entails the subsequent return of vitrified HLW to Bulgaria. The reactor storage ponds at Kozloduy NPP are close to saturation, though the on-site AFR interim wet storage facility is expected to be sufficient for another few years for all units (current accumulations only include VVER-440 fuel). However, this AFR facility is currently experiencing licensing problems. A decision on whether or not to construct a new (dry) storage facility has not yet been taken. The objective is to prevent forced closure of NPP operation due to lack of vacant fuel storage capacity.

BAS, Sofia, Research Reactor

There are 73 SF elements in AR wet storage, max. capacity 112 (in the past this SF was returned to Russia). The intention is that the spent fuel will be removed from the reactor site for reprocessing outside the country and/or interim storage at Kozloduy NPP. The preferred long-term solution is to ship this spent fuel back to Russia. Investigations are under way looking at possibilities for further use of the research reactor facilities.

Radioactive waste facilities

Kozloduy NPP

All NPP operational LILW, and some institutional RW is currently stored on-site at Kozloduy, where there are also new waste treatment (cementation, compactor, incinerator) and storage facilities under construction (expected to be commissioned in 2001). These new facilities are important for the future operation of the NPP since the current capacity for storage of RW is almost fully used. The new treatment facility will enable the currently stored RW to be treated, conditioned and stored on-site until a national RW repository becomes available. The new storage is estimated to be sufficient for 25 - 30 years. A new national disposal facility for the wastes from Kozloduy and other producers is planned, and site selection is currently in progress.

Novi han Disposal

The Novi han near-surface repository, located 30 km east of Sofia, was used in the past for disposal of institutional RW produced by industry, medicine, agriculture, research, etc. No radioactive waste from Kozloduy NPP has been disposed of at the site. It is a near-surface multi-barrier engineered facility and has been operated by the Institute of Nuclear Research and Nuclear Energy since 1964. Operations at Novi han have been stopped because of the licensing procedure, and the facility has been under reconstruction since

the beginning of 1998; a plan of the necessary safety upgrade measures has been developed by operators. Funding is provided by the new State radioactive waste management fund. Technical assistance and recommendations were obtained through an IAEA Technical Research Project and the PHARE Programme. Two EC-funded projects are also in progress. High-level radioactive sources, originally disposed of at Novi Han, are now accepted for temporary storage, with CUAEPP permission, at the Central Isotope Storage Facility at INRNE. This is a temporary measure pending the availability of a new radioactive source facility at Novi Han, for which the feasibility project has recently been completed (with assistance through a project funded by the European Commission) and the design project is imminent.

Uranium mining and milling

Uranium mining and milling activities have ended. There are approx. 500 waste rock and ore dumps, as well as the tailing ponds from the two processing plants. All responsibilities lie with the State, but despite the extent of the remediation required, there is very little funding available from the State budget. PHARE is funding important remediation measures, principally involving urgent tailing pond stabilisation, at Buhovo and Eleshnitsa.

Legal, regulatory and organisational framework

Legislation

The Act on the Use of Atomic Energy for Peaceful Purposes (AUAEPP) became law in 1985 and revised and amended in 1995 and 1998. According to this Act, all nuclear activities require a licence. The requirements and procedures for licences are set out in the Act and its implementing regulations. According to the Act, the Committee on the Use of Atomic Energy for Peaceful Purposes (CUAEPP, set up in 1957) is responsible for national policy in the field of the safe use of atomic energy. State control of all aspects of atomic energy, including nuclear materials and RW, is assured by the CUAEPP via the Inspectorate on the Safe Use of Atomic Energy (ISUAE) (Article 17 of AUAEPP).

The implementing regulations cover inter alia:

- safety of nuclear power plants during design, construction and operation (1987 Regulation) This Regulation is being amended in order to meet the more stringent international safety requirements for nuclear power plants and to include additional requirements concerning the decommissioning of nuclear power plants.
- accounting, storage, and transport of radioactive waste (1988 Regulation);
- authorisations for the use of nuclear energy (1988 Regulation);
- collection, treatment and final disposal of radioactive waste (1992 Regulation). However, the Regulation does not apply to spent nuclear fuel or to the waste resulting from its treatment. This Regulation is undergoing revision.

Waste producers are responsible under the AUAEPP for the treatment and conditioning of their waste and for storage of their waste until it is transferred to the State, at which point it becomes State property.

The 1995 amendment of the Act included establishment of two funds, one to finance the decommissioning of nuclear facilities and the other to finance the safe storage of radioactive waste; these funds, financed by operators of nuclear facilities and by persons generating radioactive waste respectively. Moreover, the amendment established a clear distinction between the functions of the national regulatory body and those of operators of nuclear installations.

The Atomic Energy Act is under review in 2000 to take into account the Convention on Nuclear Safety as well as the EU legislation. Thus it will include a more precise definition of the functions of the regulatory body on state control over nuclear safety and radiation protection. A programme to upgrade Nuclear Safety Regulations is also under way. In November 1999, the Council of Ministers approved a programme for developing and updating the national legislation in the field of spent fuel and radioactive waste to comply with the Joint Convention. Under a new Act, the CUAEPP will be the regulatory body pursuant to the requirements of the Joint Convention.

Regulatory bodies

The Inspectorate on the Safe Use of Atomic Energy, ISUAE, regulates all physical and legal entities on compliance with the established requirements on the safe use of atomic energy, including all aspects relating to the accounting, storage and transport of nuclear material and radioactive substances. Thus, ISUAE issues licenses for activities in the field of atomic energy and performs verifications together with the specialised regulatory bodies on the safe use of atomic energy.

Implementation

A proposed National Strategy is under discussion in Bulgaria that foresees the creation of a radioactive waste management agency to manage spent fuel and radioactive waste. A PHARE project, launched at the end of 2000, is currently in progress to assist the Bulgarian authorities in the setting-up of this new agency. The main bodies presently responsible for the management of RW are Kozloduy NPP in the case of RW generated at the site and BAS in the case of RW generated outside the nuclear fuel cycle. The "Policy on the Management of the Nuclear Fuel Cycle and Radioactive Waste of the National Electric Company for the Period 1998-2010" was approved by the Board of Directors of NEK in 1998. This policy document lists inter alia:

- reconstruction of the existing wet SF storage facility and its upgrading to ensure compliance with the current safety requirements
- shipment of limited quantities of SNF from the VVER-440 units to Russia for reprocessing;
- decision on the temporary storage of SF from Kozloduy NPP (50 year period).

Direct disposal of SF in not considered in current NEK Policy.

Financing

Under the AUAEPP, producers of radioactive waste are required to make payments to the “Safe Management of RAW Fund”, set up in 1999. Payments are made both by nuclear power plant operators and by producers of small amounts of waste, but organisations funded by the state budget are not required to pay. Nuclear power plant operators pay a 3% electricity levy monthly. In addition to the contributions from the small producers and nuclear power plant operators, the Fund also receives money from State subsidies and other sources. The Fund is kept in bank accounts at the Bulgarian National Bank. There also exists a Nuclear Facility Decommissioning Fund that also commenced in 1999. NEK pays 8% of its average sales of electricity into this Fund.

CYPRUS

Installations

Reactors

There are no nuclear Power Plants, research reactors or any other facilities concerning the 'fuel cycle' in Cyprus.

Radioactive waste facilities

The main use of ionising radiation and radiation sources is in medicine and industry as well as in analysis, research and teaching.

Legal, regulatory and organisational framework

Legislation

A draft framework law for the protection from risks due to ionising radiation has been prepared and is presently under legal vetting at the Attorney's General Office. This law will be in line with the relevant European acquis and the standards of the International Atomic Energy Agency. The law is expected to be approved before the end of 2001.

In the mean time, the Department of Labour Inspection of the Ministry of Labour and Social Insurance is drafting regulations to cover all issues related to the use of ionising radiation, including radioactive waste management and emergency preparedness and response.

The import of radioactive waste into Cyprus will be prohibited according to the above drafted law.

Regulatory bodies
(No info)

Implementation
(No info)

Financing
(No info)

CZECH REPUBLIC

Installations

Power reactors

The Czech Republic has two nuclear power plants at Dukovany and Temelin.

NPP unit	Reactor type	Start of construction	First grid connection	End of design life
Dukovany (in operation):				
Unit 1	VVER-440/213	1974	02/1985	2015
Unit 2	VVER-440/213	1978	01/1986	2016
Unit 3	VVER-440/213	1978	11/1986	2016
Unit 4	VVER-440/213	1978	06/1987	2017
Temelin (under construction and commissioning):				
Unit 1	VVER-1000/320	1986	2001?	(30 years)
Unit 2	VVER-1000/320	1987	2002?	(30 years)

Research reactors

The Czech Republic has three research reactors (LVR-15 and LR-O at the Nuclear Research Institute (NRI) of Rez and a training reactor VR- l P at the Czech Technical University of Prague). There are also two decommissioned reactors: the Škoda SR-0 training reactor of Plzen and the TR-0 reactor of Rez. The licensing authority is the State Office for Nuclear Safety.

Name	Reactor type	Thermal power (kW)	Status	Criticality
LR-0	Pool-Var	5.00	Operational	1983
LWR-15 REZ	Tank WWR	10,000.00	Operational	1957
SR-0	Pool	1.00	Decommissioned	1971
TR-0	Tank	0.30	Decommissioned	1972
VR-1 VRABEC	Pool	1.00	Operational	1990

(From EUR 19154 EN, IAEA data base and NEA report)

Spent Fuel Facilities

NPP UNITS	SF elements/a	No. in storage	Storage type	Remarks
Dukovany 1-4 (VVER-440/213)	~360	2408 (in 1999) 3192 (end 2000)	AR, Wet AFR, Dry (casks)	Full -
Temelin: 1-2 (VVER-1000/320)	~84	0	AR, Wet	Under construction

Dukovany

The reactor cooling ponds in Dukovany were close to saturation, but a new SF storage facility (dry, Castor casks, AFR) was granted an operating licence in April 1997. This extension to the SF storage capacity can accept about 5000 VVER-440 SF assemblies, but this will not be sufficient for the full lifetime of the operating reactors. Therefore another interim storage facility, which will consist of the enlargement of the existing one, is planned and will have a capacity for up to the end of NPP lifetime. The permission procedure has started and the EIA process for this facility has already been completed. The Min. of Development issued siting approval in November 2000.

Temelin

The Temelin plant is under construction and commissioning. Unit 1 went critical in 2000 and fuel loading is planned for 2001 for Unit 2. It is planned that Temelin spent fuel elements will be stored in the reactor storage pool of the plant (inside the containment) for about 10 years. Subsequently, after 2014, the spent fuel elements will be transferred to dry cask interim storage at an AR facility at the Temelin site. In addition, the siting approval process for a reserve interim storage capacity is almost completed, but this site (well removed from the NPP) will only be used if the siting process for the facility at Temelin is unsuccessful.

NRI, Rez (Research reactors)

At ÚJV Řež a.s. (Nuclear Research Institute – NRI) all the SF from LVR-15 research reactor is stored on-site, either in AR (IRT fuel) or AFR ponds, or, in the case of most of the original EK-10 fuel in dry storage. The AFR storage facility has only been in operation since 1996, and present accumulations are ~ 470 fuel assemblies, though capacity is sufficient until 2002 only. This facility only serves for storage of fuel from the LVR-15 research reactor, and consists of a dry and wet part. At present, the enlargement of the wet storage is being considered. This enlargement will be sufficient for the next 10 years of LVR-15 operation. In parallel, possibilities regarding transport of all this spent fuel back to Russia for reprocessing are being discussed.

(From EUR 19154 EN, IAEA rrdb, WENRA report, new info from Cz)

Radioactive Waste Facilities

All repositories, including the closed-down Hostim facility, are operated and monitored by radioactive waste management organisation RAWRA. Assuming the present rates of production of radioactive waste remain the same, the capacity of the repositories will probably be sufficient for decades.

The low/medium level waste complying with acceptance criteria will be disposed of in existing repositories with the aim of maximising their capacities. Currently, high-level waste and other waste not suitable for disposal is stored at the places of origin.

Dukovany NPP and Temelin NPP

Within the Dukovany NPP complex, there are various treatment facilities for the conditioning of operational LILW waste (evaporation facilities, bitumen plant, supercompactor). At the Temelin NPP (under construction) there are treatment facilities for NPP operational LILW (evaporation facility and bitumen plant).

At the Dukovany NPP there is a surface repository (reinforced concrete vaults) that is designed to accommodate all future operational LILW from both NPP. Wastes that are not acceptable for disposal in that repository are stored in specially designed storage facilities and will be conditioned during decommissioning of the NPP.

Richard, Bratrství and Hostim repositories for institutional waste

There are two repositories in operation for the disposal of institutional waste, one at Richard near Litomerice and the other at Bratrstvi in Jachymov. Richard is a former limestone mine and Bratrstvi is a former uranium mine. Bratrstvi is designed only for waste containing naturally occurring radioactive material (NORM waste). The Hostim repository was closed in 1965 and finally sealed in 1997. Institutional waste not accepted at these repositories is stored by the waste producers, e.g. at NRI, where a new storage facility for HLW has recently been completed.

NRI, Rez

The NRI is the biggest producer of institutional RW including HLW. There are on-site storage facilities (new facility recently completed). In the treatment centre of the NRI, liquid wastes are treated by evaporation and cementation, whereas solid wastes are compacted and embedded in concrete drums.

(From EUR 19154 EN and EUR 18185 EN)

Uranium mining and milling

Uranium mining is currently continuing, with an annual production of some 600 teU. Current annual generation of mining and milling tailings is around 185000 m^3 and 37000 m^3 respectively. The very large-scale and widespread nature of these mining activities over the last 50 years has left a significant environmental legacy - there are some 370 waste rock and ore dumps, total volume approx. 52 x 10^6 m^3, and fourteen tailing ponds, total area 6.1 km^2. The responsibility for remediation of these liabilities lies with the State, through the State mining company DIAMO. In 2000, the Czech government decided to extend the deadline for ending all mining activities by two years to 1st January 2004.

Legal, regulatory and organisational framework

Legislation

The new Atomic Law (1997) specifies the distribution of responsibilities between the various authorities in the field of the use of nuclear energy and establishes funds for RW management and decommissioning. This Act establishes the State Office for Nuclear Safety, SÚJB, as the main state supervisory and regulatory body. The Atomic Act appoints SÚJB as the competent body for the licensing and inspection of nuclear facilities and workplaces using ionising radiation. It also names the Radioactive Waste Repository Agency (RAWRA) as responsible for storage and disposal of radioactive waste or of irradiated fuel, if it has been declared waste by the generator or by SÚJB. The Atomic Act enshrines the principle that the polluter pays.

There are nearly 20 accompanying new regulations elaborating the principles set out in this new Law, inter alia covering:

- radiation protection requirements;
- criteria for siting nuclear facilities and very significant radiation sources;
- nuclear safety and radiation protection assurance during commissioning and operation of nuclear facilities;
- decommissioning of nuclear installations or workplaces with significant or very significant ionising radiation sources;
- transportation of nuclear material and radionuclide sources;
- emergency preparedness;
- contributions to be paid by radioactive waste generators to the Nuclear Account.

A proposal of a national radioactive waste and spent fuel management strategy (the Concept) was completed in 2000. This draft is now being reviewed at the governmental level. The Concept deals with all waste categories and sets the following goals:

- to harmonise legislative documents regulating waste management with those of EC and with other Czech regulations applicable on waste management;
- to operate existing near surface repositories until their capacity is fully utilised;
- to provide a centralised waste conditioning capacity to producers of institutional waste;
- to provide a storage service for waste unacceptable to existing repositories;
- to build storage facilities for spent nuclear fuel according to the earlier decision of the Czech Government;
- to select sites and technologies suitable for construction and operation of a deep geological repository;

- to prove feasibility of the construction of the deep geological repository;
- to promote studies on advanced spent fuel recycling methods;
- to assure sufficient financial resources for waste disposal through the proper management of the nuclear account;
- to check regularly whether decommissioning funds at operators of nuclear facilities are created as prescribed;
- systematically provide information to the public about waste management issues.

Management of waste from uranium mining activities is the responsibility of the state mining company DIAMO. Under Czech Mining Law, these are not considered as waste but as source raw material. A draft mining act is under preparation. It will introduce a new administrative procedure to better regulate mining of minerals by enterprises.

Regulatory bodies

Matters concerning the strategy for SF, decommissioning and waste management are under the authority of the Ministry of Industry and Trade, while environmental protection is the responsibility of the Ministry of Environment.

The main regulators are the State Office for Nuclear Safety (SÚJB), and, for underground repositories, the Czech Mining Office. SÚJB exercises administrative and supervisory authority over the uses of nuclear energy and ionising radiation, state supervision over nuclear safety and nuclear materials, including accounting and control, physical protection, radiation protection and emergency preparedness, as well as the management of radioactive waste and spent fuels. SÚJB reports to the Government and is funded from the state budget, approved by the parliament.

Implementation

The Czech radioactive waste management agency RAWRA was established in 1997 and is a state-owned organisation reporting to the Government through the Minister of Industry and Trade. RAWRA is responsible, amongst other tasks, for the preparation, construction, commissioning, operation, monitoring and closure of radioactive waste repositories, as well as the handling of RW and the treatment of SF. The waste producers, the regulators and RAWRA act independently of each other. RAWRA took over ownership of the existing repositories on 1st January 2001, as required under the new Atomic Law; updating of the safety documentation for Dukovany is required by 2001 and for Richard and Bratrství by 2003.

Financing

The waste producers must bear the costs of RW management, including waste disposal and associate costs of RAWRA. The NPP operator pays levies into a fund, the Nuclear Account, according to the average production of electricity in the NPP during the past five years. Small producers pay on acceptance of their waste for disposal. A new methodology for the calculation of levies is expected to be introduced in 2001 (PHARE assistance project started in second half of year 2000), following completion of a registration of waste producers. This new methodology will take into account the possibility of unexpected costs arising in the future. Generators are required to create a financial reserve for decommissioning nuclear installations so that financial resources are available in the future in appropriate amounts at the right time. The Nuclear Account is managed by the Ministry of Finance and funds in the Nuclear Account are kept at the Czech National Bank, as part of State assets.

Additional reference

Konopásková, S. and F. Woller, Recent development related to safety case in the Czech Republic, country report prepared by RAWRA for the 2nd meeting of the OECD/NEA IGSC, Paris, 15-17, November 2000

ESTONIA

Installations

Reactors

The two submarine reactors (70 and 90 MWth) at the ex-Soviet naval training centre at Paldiski were defuelled in 1994 and all the fuel elements returned to Russia. Therefore, no spent fuel is stored on the territory of Estonia. The reactors, including the concrete reactor sarcophagi, are being decommissioned under an international project, with the resulting decommissioning waste being treated on site.

Radioactive waste facilities

Paldiski

There is an on-site interim storage for conditioned RW with an associated waste treatment facility. This new storage facility was authorised by the Estonian Radiation Protection Centre (ERPC) in 1997. Solid RW from the Paldiski site, as well as institutional RW, is being conditioned and packaged by the present site operator, ALARA Ltd., and placed into this new interim storage. Though the spent nuclear fuel from two reactors at the Paldiski training centre was transported to Russia in 1994, the reactor vessels, accumulated operational radioactive waste and the contaminated auxiliary facilities were remained on site. Management of this waste is now responsibility of the national authorities.

Tammiku

This small LILW disposal facility of former USSR design ("Radon" type), situated 12 km from Tallinn, was built at the beginning of 1960s and closed in 1997. There are plans to repackage and transfer the waste to the Paldiski site, where it will be stored pending the availability of a more suitable disposal site.

Uranium mining and milling

Sillamäe

The Sillamäe metallurgical plant was established by the Soviet Union in 1946 for processing of uranium ore, though uranium milling at the site ended in 1977. Today, niobium and tantalum are among the major products and the generated wastes should be classified as TENORM waste. Operations at the plant were privatised in early 1998. There is a large tailing pond and associated gravel dam, situated on the coast. The total quantity of uranium mill tailings is about 11.7×10^6 tonnes, and the volume of the tailings pond is approx. 8×10^6 m^3 with a surface area of 0.39 km^2. The estimated quantities of uranium, thorium and radium at the site are 1830 tonnes, 850 tonnes and 7.8 kg respectively. A major project on implementing remediation measures at the site (strengthening of the dam and covering of the pond) started at the end of 2000 and is being co-ordinated by NEFCO with financing from several donors, including PHARE.

Legal, regulatory and organisational framework

Legislation

The Radiation Act of 1997 is the principal legal instrument in the field of radiation protection of workers, the public and the environment. The Radiation Act is based on the International Safety Standards and the EC Directive 96/29/Euratom. The Radiation Act defines the framework for and establishes the rules applicable to the use and possession of sources of ionising radiation, the transport of radioactive materials, radioactive waste disposal and other activities that may cause harm to health or to the environment. It also contains general provisions on radioactive waste management, import and export of such waste and the prohibition against importing radioactive waste for final disposal purposes. The Act provides for a system of licensing covering all activities using ionising radiation. The Act authorises the Parliament to make decisions concerning the commissioning of nuclear facilities. All other nuclear activities are to be covered by a specific law. Finally, the Act empowers the government and ministers to enact implementing regulations on exemption levels, dose limits, safety requirements, etc.

On 5 January 2001, Estonia signed the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Since 1997, there have been several amendments to the Radiation Act. Nevertheless, the following issues still need to be covered:

- classification of radioactive waste according to the recommendations of the EC;
- rules for clearance and the clearance levels;
- rules of decommissioning of nuclear facilities or installations;
- general rules for the management of NORM waste.

To cover these aspects and to ensure complete harmonisation in this field with requirements of EU legislation, a new Radiation Protection Act and secondary legislation are planned for 2003.

Regulatory bodies

The Ministry of the Environment and the Ministry of Social Affairs have primary responsibility over nuclear and radiological issues. The governmental body with primary responsibility for radiation protection and which has inspection and control rights, is the Estonian Radiation Protection Centre (ERPC). The Centre was founded in 1996 and reports to the Ministry of the Environment. The Ministry of Social Affairs is responsible for supervising the health of radiation workers and persons exposed for medical purposes. The ERPC initiates and prepares draft legal acts, licenses radiation practices, monitors and assesses permanently environmental radioactivity and radiation doses, supervises and inspect radiation practices, keeps the register of radiation sources and the dose register and assures education and advanced training. The budget for the ERPC comes directly from the state budget and not via the Ministry of Environment.

Implementation

ALARA Ltd. was formed by the government in 1995 and is the new operator of the Paldiski facilities. This company, which reports to the Ministry of Economic Affairs, is responsible for the general management of the site, development and implementation of projects related to radioactive waste management including installation, decommissioning and waste storage. It is also responsible for general radioactive waste management at the national level.

The final disposal of radioactive waste is the responsibility of the State under the Radiation Act. Estonia is undertaking a technical co-operation project with the IAEA and is investigating the feasibility of a LILW repository in Estonia. The timescale for a repository has not yet been set. In addition, a project was launched by the European Commission (DG-Environment) at the end of 2000 on the preparation of a national radioactive waste strategy.

The management and remediation of the site at Sillamäe is the responsibility of ÖkoSil Ltd., which was formed in 1998 on the basis of a public/private partnership. ÖkoSil's responsibilities in this context include the reinforcement of the tailings pond dam, decommissioning and environmental remediation of the site.

Financing

The fundamental principle is that the polluter pays, but the State pays for "historical waste" such as that from the former soviet facility at Paldiski and for waste where the owner cannot be identified. Thus ALARA's operational, investment and administrative costs are mainly funded from the State budget. There is no special fund established to secure the future costs for radioactive waste management in Estonia.

HUNGARY

Installations

Power reactors

Hungary has one nuclear power plant at Paks.

Paks Unit	Reactor type	Start of construction	First grid connection	End of design life
Unit 1	VVER 440/213	1974	12/82	2012
Unit 2	VVER 440/213	1974	08/84	2014
Unit 3	VVER 440/213	1979	09/86	2016
Unit 4	VVER 440/213	1979	08/87	2017

Research reactors

There is a research reactor with a power of 10 MW at the Atomic Energy Research Institute (KFKI-AEKI) in Budapest, and a training reactor with a power of 100 kW in the Technical University of Budapest. The critical assembly ZR-6M at KFKI-AEKI was shut down in 1990. The licensing authority is the Hungarian Atomic Energy Authority.

Name	Thermal Power (kW)	Type	Status	Criticality
BUDAPEST RES. REACTOR	10,000.00	TANK WWR	Operational	1959
NUCL. TRAINING REACTOR	100.00	POOL	Operational	1971
ZR-6M	0.00	CRIT ASSEMBLY	decommissioned	1972

(from IAEA RRDB database).

Spent fuel facilities

UNITS	SF elements/a	No. in storage (1999)	Storage type	Remarks
Paks 1-4 (VVER-440)	~ 440	~ 2850 ~950	AR, Wet AFR, Dry	Full -
KFKI-AEKI (RR)	< 80	~ 1100	AFR, Wet	
NUCL. TRAINING REACTOR				All fuel in core

The Interim Storage Facility for Spent Fuel is a modular system dry-storage facility designed by the English company GEC Alsthom, which can be expanded as necessary. The first seven modules (each for 450 assemblies) are in operation. The construction of the next four modules started in 2000. The facility is administered by the Public Agency for Radioactive Waste Management (PURAM). The operating personnel are contracted from the NPP.

Radioactive waste facilities

Paks NPP

NPP operational RW is treated and stored on site pending a new national disposal facility for LILW. Treatment facilities include evaporation lines, ion-exchange lines, volume reduction of liquid waste (planned), cement solidification line (planned) and compactor (50 tons force). There are interim storage vaults for solid and solidified waste. Evaporator concentrates are stored in stainless steel tanks.

Püspökszilágy

The Püspökszilágy waste repository, opened in 1976, receives solid and liquid wastes, SSRS and biological wastes from the research reactor and other institutions using radioactive materials. Solid and liquid wastes are stored in concrete pits, whereas radioactive sources are put into 6 m deep stainless steel lined wells. Solid LLW from Paks NPP was previously disposed in the Püspökszilágy repository until the end of 1996. There is very little free space left at the facility and PURAM is looking at ways of reducing the volume of existing stored waste (two EC-funded projects were launched by DG-Environment in 2000). Recent PHARE projects have assisted in safety studies at Püspökszilágy.

Site selection project for a disposal facility for low- and intermediate-level radioactive waste

In site investigations for a new LILW repository for NPP operational waste have started. The Geological Institute of Hungary concluded in its summary report that the granite in the Üveghuta area in south-west Hungary is suitable for an underground repository of LLW/ILW wastes and that detailed site investigation and characterisation should continue. Preliminary site investigations were financed through a PHARE project, and the site selection process was subject to an international peer review in the framework of the IAEA WATTRP services, which concluded with favourable results in November 1999.

Project for high-level radioactive waste disposal

Geological site investigations for HLW and spent fuel are still on-going and a long-term policy is under elaboration.

Uranium mining and milling

All uranium mining and processing activities ended in 1997. The Government approved a five-year remediation plan for the sites affected, financed from the state budget. There are some 10.4×10^6 m^3 of waste rock and ore in eight dumps near the city of Pécs, together with two large tailing ponds with a total surface area of 2.6 km^2.

Legal, regulatory and organisational framework

Legislation

The new Act on Atomic Energy entered into force in 1997 except for some sections concerning the Central Nuclear Financial Fund, which entered into force in 1998. The new Act aims to conform to recent international rules and recommendations as issued by the IAEA and the OECD/NEA. The Atomic Energy Act applies to the peaceful uses of atomic energy, including the protection of humans and the living and non-living environment against the harmful effects of ionising radiation of natural and artificial origin. It does not apply to activities related to radioactive materials. According to the Act, the licensee, or in the case of state organisations, the central budget shall be liable to cover the costs of the final disposal of RW, as well as the interim storage and final disposal of SF, and of the decommissioning of nuclear facilities.

A large number of regulations have been adopted by the government to give effect to the requirements of the Act on Atomic Energy, inter alia on:

- The statutes of the Hungarian Atomic Energy Commission (HAEC) and the Hungarian Atomic Energy Authority (HAEA), providing them with regulatory independence.
- The procedures of the HAEA defining licensing requirements and procedures, etc.
- Safe transport of spent fuel and radioactive substances.

Further regulations are under preparation dealing with, inter alia, emergency preparedness, physical protection and environmental protection.

Regulatory bodies

In Hungary, the establishment of a new nuclear facility or RW disposal facility, as well as the addition of a further reactor unit to an existing NPP, requires first of all approval of the Parliament. It is the Government's task to control and supervise the safe application of atomic energy. The Government provides for the execution of these tasks through the Hungarian Atomic Energy Commission (HAEC), which is an advisory body of the government, and the Hungarian Atomic Energy Authority (HAEA), which is the actual regulatory authority that makes decisions on licensing, inspection and enforcement matters. A permit from the HAEA is required for siting, construction and enlargement, commissioning, operation, modification, permanent shutdown and decommissioning of nuclear facilities. Waste collection, handling and treatment on the site of nuclear facilities as well as international transportation, packaging and recording of radioactive materials are regulated by the HAEA. The HAEA is supervised by a Member of the Government (currently the Minister of Economy).

The Ministry of Health is responsible for the development and implementation of radiation standards. The Ministry also performs the licensing and controlling of the siting, construction, operation etc. of waste management facilities, but in the licensing procedure it must co-operate with the other relevant authorities.

Implementation

The Hungarian radioactive waste management agency is PURAM (Public Agency for Radioactive Waste Management). PURAM is a fully state-owned, non-profit-making organisation which reports to the Hungarian Government through the Director General of the Hungarian Atomic Energy Authority. PURAM, established in 1998, has the responsibility for carrying out tasks related to the final disposal of RW, interim storage and final disposal of SF, and decommissioning of nuclear facilities.

The operation and management of Püspökszilágy is now the responsibility of PURAM, who is also responsible for the collection and transportation of waste from waste producers. Since 1993, site explorations for a LILW repository for NPP operation waste have been proceeding. Following a geological evaluation of five granite areas in the region of Üveghuta, fieldwork continued at a single selected site. The preparation for and construction of the repository will be the responsibility of PURAM.

Preliminary geological investigations of possible HLW and spent fuel repository sites have been carried out in south-west Hungary and a long-term programme will continue.

Financing

All costs of managing and disposing of radioactive waste and spent fuel must be met by the producers under the “polluter pays” principal. The Hungarian Government pays costs relating to “historical” liabilities.

The 1996 *Act on Atomic Energy* established a separate state fund, the Central Nuclear Financial Fund, to finance the construction and operation of facilities for the final disposal of LILW, the interim storage and final disposal of spent fuel and the decommissioning of nuclear facilities.

Payments into the Fund by waste producers started on 1 January 1998 and are set so that the Fund will cover all costs of radioactive waste and spent fuel management. The Government Minister responsible for the Hungarian Atomic Energy Authority is responsible for the operation of the Fund. The Fund is managed by the Authority.

Payments into the Fund are made through an electricity levy and, for small producers, through tariff charges. In 1999, the levy paid on the nuclear share of total electricity generation (about 40%) was 0.75HUF/kWh or ~ 0.003 euro/kWh

Payments out of the Fund are subject to approval by the Minister supervising the Hungarian Atomic Energy Authority and by Parliament. They are based on plans submitted to the Authority by PURAM.

LATVIA

Installations

Research reactors

Name	Thermal Power (kW)	Type	Status	Criticality
IRT	5,000.00	POOL	SHUT	1961
RKS25	0.03	POOL	SHUT	1966

Above data from IAEA database.

Both reactors are situated at Salaspils. The IRT reactor is owned by the Ministry of Environmental Protection and Regional Development (MEPRD), and was shut down in 1998. The RKS25 reactor is owned by the Nuclear Research Centre of the Latvian Academy of Sciences, and was shut down in 1993. The licensing authority for both reactors is the Radiation and Nuclear Safety Inspectorate, which is a part of the MEPRD.

Spent fuel facilities

Salaspils research reactors

Approximately 80 fuel assemblies are currently stored in the reactor pool. The pool was recently reconstructed, the work being finished at the beginning of 2001, and now has a certificate for storage of fuel up to 2008. The current plan is that the spent fuel will remain in wet storage until 2003, when it will be transferred either to new dry storage at the Salaspils site or will be shipped outside of Latvia for reprocessing. For Latvia, the best option regarding management of this spent fuel is return to Russia. In the past, spent fuel was twice sent back to Russia, but this will only be possible in the future if mutual agreement can be reached between the Governments of Latvia and Russia with the help of international support from the European Union, the IAEA and other countries (e.g. USA). Latvia would be willing to send this spent fuel for disposal in another country and to accept an equivalent amount of conditioned waste into Latvia in return. The draft decommissioning plan, which was accepted by the Government of Latvia in October 1998, provides for the alternative of temporary dry storage of spent fuel at the reactor site if it proves impossible to send it abroad. This latter option would be expensive and, in any case, only temporary.

Radioactive waste facilities

Baldone

The state-owned company Radons operates a RW disposal site near Baldone, adjacent to the Salaspils research reactor site. Over the years, this site has received the RW from the RR and other institutions and industrial concerns. In addition, the RW from the former military bases located in Latvia and Kaliningrad were disposed of at Baldone until 1974. About half of the total waste activity at the Baldone repository originates from military waste. The Baldone facility was built in accordance with the standard requirements ("Radon" type) of the Soviet era, and therefore will not conform to the currently accepted IAEA recommendations for such repositories. A current EC project is performing a long-term safety assessment and EIA in view of the future planned use of the facility, especially for disposal of research reactor decommissioning waste.

Salaspils

There is temporary storage of decommissioning waste at the research reactor site.

Legal, regulatory and organisational framework

Legislation

The Law on Radiation Safety and Nuclear Safety, adopted in its new version on 26 November 2000, establishes a legislative framework for all practices with radiation sources, including the activities related to the research reactors, fuel cycles, spent fuel and radioactive waste management facilities. This new version also requires that establishing of a Radiation Safety Centre. The Centre will be operational from June 1 2001 and will be an independent institution with responsibility for supervision and control in radiation safety and the field of nuclear safety. Swedish International Projects (SiP) will support the establishment of the Centre by providing grants for office equipment, etc.

The original Act on Radiation Protection and Nuclear Safety entered into force in 1995 and was amended in 1998 and now for a second time in November 2000. Several regulations have been adopted pursuant to the Act, e.g.

- Regulations for protection against ionising radiation.
- Regulations on the safe transport of radioactive materials
- Regulations on radioactive waste management
- Regulations on accounting and control of nuclear materials
- Regulations on issuance of licenses and permit for activities with radioactive substances and other ionising radiation sources.

The Regulations on Radioactive Waste Management establishes exemption levels based on the IAEA and the EC directives, prescribes the responsibilities of waste producers, radiation safety officers at facilities, the state enterprise Radons, and state authorities. They also introduce long-term safety and environmental impact assessments and classifying waste. The regulation also establishes rules for site selection, including public hearings for new disposal facilities or safety-relevant modifications at existing sites.

Regulatory bodies

The Ministry of Environmental Protection and Regional Development (MEPRD) and the Ministry of Welfare are the two regulatory bodies with jurisdiction in the nuclear field. The Radiation and Nuclear Safety Inspectorate is a part of the Environmental State Inspectorate which is a part of the MEPRD. The mandate of the inspectorate is to license activities involving the use of ionising radiation, monitor compliance, to authorise transport of nuclear and radioactive materials, safeguard, to organise and update the state database for radioactive materials and radiation sources.

The establishing of the new Radiation Safety Centre is part of a strategic plan of the Cabinet of Ministers, as engendered by the amendments to the Law on Radiation Protection and Nuclear Safety. In general, the plan covers:

- the duties, responsibilities and powers, as well as the setting-up of the new Radiation Safety Centre
- the introduction of a Radiation Safety Board as an advisory and co-ordinating body
- the establishing of an Authorisation Commission composed of persons from the Radiation Safety Centre and representatives from certain Ministries.

Implementation

A new public company, RAPA Ltd., was established in February 2001 and combines the former Reaktors Ltd. (dealing with decommissioning of the Salaspils research reactor) and the State company Radons (operators of the Baldone repository, which is now called "Radons site"). RAPA Ltd. is a state organisation.

RAPA Ltd. (ex Radons) manages and monitors the Salaspils reactor and performs the conservation and dismantling, and in addition is responsible for the management of radioactive waste, i.e. collecting waste from all sources, processing it and ensuring its safe disposal. The new radioactive waste management regulations will introduce the possibility of RAPA Ltd. entering into commercial agreements for waste conditioning services and certification of waste packages.

In 2001-2003, RAPA Ltd. plans to build a new solid waste disposal vault at Radons site (ex Baldone) with a volume of about 1600 m^3 to accommodate decommissioning waste. This repository will take waste from decommissioning of the research reactor, together with waste from industrial sources.

A project financed by the European Commission is currently performing a long-term safety analysis of the Baldone radioactive waste repository and the updating the waste acceptance criteria. On the basis of the assessment, updates to radioactive waste management regulations will be prepared. In addition, the results will be used in the EIA procedure that is also required before approval to extend the existing site can be granted. The extension is needed to accommodate all waste coming from the decommissioning of the research reactor.

Financing

The basis for financing is that the polluter pays. However, the State will continue to take responsibility for wastes generated before this principle was acknowledged. This means that 5-10 years after the introduction of the proposed new mechanism the State will still be paying a proportion assessed at 50% of the total. The decommissioning of the research reactor will be financed by the State. The Steering group has been created with the order No. 11 of the Minister of Environmental Protection and Regional Development in January 2001, for the co-ordination of Salaspils decommissioning project.

The waste management operations of RAPA Ltd. are financed by the state, but RAPA will receive supplementary funding from the import duty for radioactive substances. The Environmental Protection Fund of the MEPRD is responsible for collecting this import duty. This Tax on Environmental Resources will be in force from 2002.

LITHUANIA

Installations

Power reactors

Lithuania has one nuclear power plant at Ignalina with two reactors of type RBMK-1500, presently operated at a maximum power level of 1300 MWe.

Unit	Type	Start of construction	First grid connection	End of design life
INPP-1	RBMK 1500	1977	12/1983	2013
INPP-2	RBMK 1500	1978	08/1987	2017

Spent fuel facilities

Ignalina NPP

UNITS	SF elements/a	No. in storage (1999)	Storage type	Remarks
1-2 (RBMK1500)	~ 800-1000	12392	AR, Wet AFR, Dry cask	 From 2000

The dry cask storage facility is designed and built to Western standards and provides SF storage for up to 50 years in CASTOR-RBMK casks. A license for interim storage of SF using these CASTOR containers was issued by VATESI in early 2000.

Radioactive waste facilities

Ignalina NPP

The treatment & storage facilities at Ignalina receive NPP operational RW as well as institutional LILW and SSRS. Treatment facilities include evaporation lines, bituminisation lines and an incinerator (planned). In a later stage the supercompaction of ILW and melting of metal scrap is foreseen. The LILW storage capacity at INPP was intended to be sufficient for the whole operational lifetime of the NPP, but for some waste types this storage space is becoming limited because waste arisings have exceeded predictions. There is an on-going collaboration between Sweden and Lithuania to help resolve the operational RW situation at Ignalina (some co-funding provided by the EC).

Maišiagala

The Maišiagala disposal facility is of the Soviet-designed "Radon" type. It received institutional LILW and SSRS. It was closed in 1988. The overall volume of the sub-surface vault is 200 cubic meters. At the end of the disposal period the vault was filled to about 60% with waste. The existing Maišiagala facility does not provide long-term storage of the waste already disposed in the facility even though specific measures will be taken to improve its safety. Two alternative concepts have been defined that could provide this required high level of safety in the long term: addition of additional surface barriers and retrieval of waste followed by conditioning and interim storage pending final disposal at an alternative site.

Legal, regulatory and organisational framework

Legislation

The Law on Nuclear Energy was adopted in 1996. The Law contains a very general definition of nuclear activities and sets out the obligation to obtain a licence from the competent authority in order to engage in such activities. Activities subject to licensing include: the construction and operation of nuclear installations, activities which could affect safety during the operation of such installations, the decommissioning of nuclear installations, the storage of radioactive waste and other radioactive material, the acquisition, possession or transport of radioactive material, and the import and export of all material belonging to the nuclear energy sector. It further lays down the principles for the creation and management of the decommissioning fund that was established by Decree No. 1403 of 1995.

The Law on the Management of Radioactive Waste was adopted in 1999. This instrument establishes the rights, duties and functions of the state executive and supervisory authorities and of persons and legal entities involved in radioactive waste management. including its export and transit. The Law is divided into ten Chapters governing, inter alia, licensing, responsibilities of waste generators, creation of the Radioactive Waste Management Agency and the Radioactive Waste Management Fund, and requirements concerning radioactive waste management facilities, including their siting, design, construction, commissioning, operation, decommissioning and control after closure. The Law provides for the creation of a storage facility or repository.

Recently, VATESI approved the "Regulations of spent fuel intermediate dry storage facilities" and the "General requirements for the decommissioning of Ignalina NPP". In 2001, VATESI will issue a new "Regulation on Pre-Disposal Management of Radioactive Waste at the Ignalina NPP" in which the old classification system will be replaced by the new one, based on the principles given by IAEA. The new system also requires that waste should be classified on grounds of longevity, which is particularly important for the choice of the final disposal method.

Regulatory bodies

The Nuclear Power Safety Inspectorate (VATESI), created in 1991, is the nuclear regulatory authority in Lithuania. Its duties include:

- drafting and, under the authority of the government, approving safety standards and rules for the design, construction and operation of nuclear facilities, for storage of nuclear and radioactive materials and for waste disposal;
- ensuring adherence to the requirements set out in licences and safety rules through assessment of the safety of nuclear facilities;
- establishing the system of accounting for and control of nuclear materials; and
- issuing licences for the design, construction, modification, operation and maintenance of nuclear facilities and of their components, the acquisition, possession and transportation of nuclear materials and the storage and disposal of radioactive waste.

VATESI works in co-ordination with the Ministry of Health and the Ministry of Environment. Institutional waste is subject to radiological control by the Radiation Protection Centre under the Ministry of Health. In February 2001 the regulation on "Management of Radioactive Waste" was adopted which sets the requirements for collection, shipment and treatment of radioactive waste, generated by small waste producers, and its management. Furthermore the regulation on "Radiation Protection at Nuclear Power Plant" was adopted in February 2001. This Hygiene Standard sets out radiation protection requirements for the workers working at the nuclear power plant and for radiation protection of members of the public.

Implementation

Pursuant to the Law on Radioactive Waste Management of 1999, the Ministry of Economy is to establish a Radioactive Waste Management Agency in 2001, which will be a state enterprise. The Agency will be responsible for the safe management of radioactive waste transferred to it by waste generators, and will be the operator of radioactive waste management facilities. The primary responsibility for long-term planning, necessary investigations and future implementation of repository projects and transport systems lies with the Ministry of Economy. Hitherto, the Institute of Physics is responsible for the collection and transport of institutional waste as well as for the repository at Maišiagala. Evaluation of the long-term safety of both Maišiagala and the stores at INPP was completed in 1998 with the assistance of Swedish experts from SKB and SSI. These evaluations concluded that with the construction of additional barriers the storage facility for bituminised RW at INPP could be converted into a final repository. Also, retrieval of RW from the Maišiagala site was recommended.

A big challenge for VATESI is the implementation of the Ignalina Unit 1 Decommissioning Programme, which was adopted by the Government in 2001. It deals with the number of pre-decommissioning projects as well as construction of new radioactive waste management facilities. A Donor's Conference was held in Vilnius in June 2000, resulting in substantial promised support to the operator and regulator in these activities. This would include assistance in establishing local TSOs (Technical Safety / Support Organisations). Considerable PHARE assistance has been promised by the European Commission.

A Strategy of Radioactive Waste Management was prepared in 1999 and is intended to be adopted by the government in 2001. The Strategy of Spent Nuclear Fuel Management will be a part of the strategy on radioactive waste management.

The provisions of the new Law on Radioactive Waste Management (1999) foresee the creation of a radioactive waste management agency in 2001 (to be a State body under the Min. of Economy); its main responsibilities will be the disposal of radioactive waste. In order to reduce the total cost of decommissioning, the construction of a repository for short-lived radioactive waste is foreseen.

Preliminary investigations of possibilities on deep geological disposal in the territory of Lithuania are foreseen. However, Lithuania will also raise the issue of disposal of SNF in regional repositories with international organisations like the IAEA.

Financing

According to the new Law on Radioactive Waste Management, the burden of all expenses related to waste management lies with the waste generator until the radioactive waste is transferred to the new Radioactive Waste Management Agency or is exported from Lithuania. A special fund will be established to finance RW management activities. At present, a decommissioning fund for Ignalina NPP receives contributions through an electricity levy. However, the new Radioactive Waste Management Fund will receive contributions and allocations from several sources, including the NPP operator, small producers, the State budget etc. This is in contrast with the present situation where small producers do not pay towards the cost of RW management. A limiting factor affecting the adequacy of these funds is the remaining operational lifetime of Ignalina NPP.

MALTA

Installations

Reactors

The country is very small with a very high population density. There are no power or research reactors in the country, or plans to construct any.

Radioactive waste facilities

The main users of radioactive substances in Malta are the medical and industrial sector.

Malta wishes to seek and make arrangements for the export for recycling or final disposal of small radioactive sources (such as teaching sources and sources in equipment) that are currently stored in Malta.

Legal, regulatory and organisational framework

Legislation

Most of the legal provisions are implemented by the users of radioactive substances and it is recognised that there needs to be a separation between the functions respectively of users and regulators. To this effect, a specific and independent regulatory system will be set up by the end of 2002. The Occupational Health and Safety Authority, the Environment Protection Department, the Public Health Department and the Civil Protection Department will be responsible for specific aspects of this acquis.

The above measures will fully cater for the requirements of harmonisation and alignment with EU legislation. They will make provision for the regulation and control of (the remote) future possibility of setting up in Malta nuclear reactors, manufacturing or waste facilities. In the event of Malta making use of nuclear energy, the Malta Resources Authority will be responsible for issuing licences and regulating this sector.

Several acts in the form of subsidiary legislation concerning the Basic Safety Standards, Public information and exchange of information, shipping, health and food will be adopted in 2002.

The administrative provisions of Regulation 1493/93/EURATOM (shipments of radioactive substances between Member States) were implemented in November 2000. This system will be integrated with the EU mechanism on accession.

Malta will sign the IAEA Additional Protocol on the amplification of the reporting and accountancy procedure in the safeguards agreement by the end of 2002.

Regulatory bodies

The basic safety requirements in line with international practice as they apply to Malta are in place. Further improvements, especially in the separation of the roles of regulator and user are planned for implementation by the end of 2002.

There are no specific organisational issues having a bearing on nuclear facilities such as reactors or waste management installations. However, Malta will, with the assistance of the International Atomic Energy Agency, be upgrading its regulatory capacity to provide for such an eventuality.

Implementation

There are no decommissioning or closure activities in progress or planned for the future.

In May 2001, an Integrated Solid Waste Management Strategy Plan commissioned by DG Environment will be finalised. This will cater for the proper collection and disposal of hazardous waste including radioactive waste.

Financing

Funding is available for present requirements connected with type and extent of the current use of radioactive materials. Such funding is provided as part of normal operational practices and there is no specific legal requirement for the provision of such funding.

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POLAND

Installations

Research reactors

Name	Thermal Power (kW)	Type	Status	Criticality
AGATA	0.10	POOL	SHUT	1973
ANNA	0.10	CRIT ASSEMBLY	decommissioned	1963
EVA	10,000.00	TANK WWR	SHUT	1958
MARIA	30,000.00	POOL	operational	1974
MARYLA	100.00	POOL	decommissioned	1967

Above data from IAEA research reactor database.

All the research reactors are owned by research institutes and located at the Swierk facility. The first research reactor EVA was shut down in 1995 and its decommissioning is in progress. In 1999, a process of conversion (from 80% to 36% enriched fuel) of the MARIA reactor was started with the introduction of one instrumented fuel element. As a result of the good results obtained, two more fuel elements were added. In 2001 the process of conversion will be finished. The operating organisation (IAE) has started an upgrade of the instrumentation and control of the reactor.

The licensing authority is the National Atomic Energy Agency (NAEA). In its 1998 National Report under the Convention on Nuclear Safety, Poland declared that the principles in Article 19 (dealing with operational safety) are in force with regard to the operation of the MARIA research reactor.

Spent fuel facilities

IAE, Swierk RR

UNITS	SF elements/a	No. in storage	Storage type
AGATA	(shut down)	264	AR, Wet
ANNA	(decomm)	28	AR, Wet
EVA	(shut down)	5134	AFR, Wet
MARIA	~ 10-20	271 (end 1997)	AR, Wet
MARYLA	(decomm)		

No SF has ever been returned to the Russian supplier. As seen in the table, there are consequently on-site accumulations of nearly 6000 SF assemblies from the operation of the two RR. Some fuel has been in wet storage since 1958. The SF is stored temporarily in AR or AFR ponds at the IAE; maximum storage capacity of these ponds is 11720 f.a. The future of this SF is uncertain, and the construction of a dry interim storage facility is under investigation.

Radioactive waste facilities

Swierk

Treatment & storage of ILW and LLW liquid waste and LILW solid waste: evaporation facility and membrane separation facility (liquid wastes), chemical treatment facilities, cementation unit, bituminisation unit, hydraulic press (12 ton), temporary storage facility.

Rozan

Near-surface repository / storage. LILW Institutional waste, SSRS, Interim storage in case of alpha waste. The site was originally a military fort, converted to a repository in 1961, and is still accepting industrial and medical LILW. Low- and intermediate-level beta and gamma waste is being disposed of in a moat area (facility no. 8), and alpha-bearing waste is being placed in temporary storage in facility no.1. The PHARE project on the closure of the repository specifically considered the decommissioning options regarding facilities nos. 2 and 3 at the site, including waste retrieval, repackaging and re-disposal.

There is strong local public pressure to end RW operations. However, it is currently the only RW disposal site available in Poland. It is likely that another site for a national repository for future waste arisings will eventually have to be found. Indeed, in 1999 Poland completed a two-year Strategic Governmental Programme covering all aspects of present and possible future radioactive waste management in the country. Not only did this deal with the siting issue regarding a replacement for the Rozan facility but also considered the waste implications of a future national nuclear power programme (i.e. deep geological repository). A site-selection programme for a new repository has begun; one potential site might be at Swierk.

This detailed examination of areas suitable for near surface repository siting resulted in 19 sites being chosen for in-situ geological investigations. Unfortunately, none of the local authorities concerned are currently in favour.

Uranium mining

Most mining activities took place in Lower Silesia in the south-west of the country. Mining of ore ended in 1968, and processing was terminated in 1973. There are some 100 dumps, mostly abandoned, of waste rock and ore totalling approximately 1.4 x 10^6 m^3 as well as one tailing pond, which is currently the object of a remediation project partly funded by the European Commission.

Legal, regulatory and organisational framework

Legislation

The Atomic Energy Act of 1986 sets out the principle that the primary consideration in the use of nuclear energy should be the protection of life, health, property and the environment. In a revision to this Act, the parliament issued a new Act in November 2000 that is fully consistent with the International Basic Safety Standards for Protection against Ionising Radiation and of the Safety of Radiation Sources and relevant European Union directives, especially in the area of the public information and of the protection of outside workers, patients and people assisting during medical exposure, etc.

The new Atomic Energy Law will not be fully in force until January 2002. Only part of the Law, defining duties and responsibilities of the President of the National Atomic Energy Agency and his relations to other governmental bodies, is currently in force (February 2001).

In general, this legislation establishes a licensing system for the following:

- construction, commissioning, operation and decommissioning of nuclear installations (including research reactors)
- construction, operation, closure and decommissioning of disposal facilities for radioactive waste and spent nuclear fuel and construction and operation of storage facilities for spent nuclear fuel
- production, use, conversion, storage, transport of and trade in nuclear materials, radioactive sources and waste;

The new version of the Atomic Energy Act introduced amendments concerning, inter alia, the competent authorities empowered to regulate nuclear and radiation safety matters and procedures to be followed in the event of a nuclear or radiological accident. There were also additions concerning regulation of matters not covered by existing laws such as off-site emergency preparedness, risk from natural radiation sources, public information, radiation protection of outside workers, protection of patients exposed for medical purposes, etc.

The Atomic Energy Act is supplemented by several regulations, among them the Regulation (1989) of the President of the National Atomic Energy Agency (NAEA). This latter Regulation establishes the principles for the definition of RW, for waste classification and record keeping and for waste conditioning, storage and disposal.

Regulatory bodies

Set up in 1986, the NAEA (PAA in Polish) is the governmental agency empowered by law to deal with problems resulting from the use of nuclear energy, such as control of safety related activities, licensing and storage of RW etc. The NAEA is also responsible for education and public information as well as for international co-operation in the field of nuclear energy. With respect to installations like research reactors or spent fuel and radioactive waste facilities, a clear separation between the regulatory and managerial responsibilities of the National Atomic Energy Agency (NAEA) was not achieved with the 1986 Act, but has been introduced in the new version of the Atomic Energy Act.

The NAEA closely co-operates with the Central Laboratory for Radiological Protection (CLRP) whose personnel may be employed to carry out various regulatory activities (other than inspections and enforcement). The CLRP also performs research, development and specific studies in the field of radiation and nuclear safety. The results of these studies are directly or indirectly used in performing regulatory functions. The NAEA can request advice and / or consultation from any organisation or, if necessary, can appoint an advisory group for solving a specific problem.

Implementation

The Institute of Atomic Energy, IAE, is responsible for the management of all LILW produced in the country. It collects, treats, conditions, transports and stores solid LILW prior to disposal at the near-surface type central repository at Rozan located 90 km from Warsaw. Under the New Atomic Law, the Government will create a new, independent agency to receive, condition, store and dispose of all radioactive waste generated in Poland. Currently, these duties are carried out at the Institute of Atomic Energy and controlled by NAEA's Department for Radiation and Nuclear Safety. The group currently carrying out these functions will form the core structure for the new organisation, for which details have not yet been established.

In 1997, the Government launched the three-year Strategic Government Programme (SGP) to investigate long-term solutions for the nuclear waste disposal, particularly for spent nuclear fuel from the research reactors at Swierk.

Financing

According to Article 33 of the new Atomic Energy Law, in order to ensure national nuclear safety and radiological protection against ionising radiation in normal circumstances and in radiation emergency situations, the costs of some activities may be partially reimbursed from the national budget in the form of intentional subsidy.

In addition, a state-owned public utility, called "Radioactive Waste Management Plant" and located in Swierk, has been created according to the provisions of the new Atomic Energy Law. The utility is to ensure proper management of radioactive waste and spent fuel, including disposal, and to secure financing for management and disposal of spent fuel and radioactive waste, including waste from decommissioning. The utility will start operating from January 2002.

At present, approx. 55% of the cost of radioactive waste management are covered by the State (from the national budget via NAEA budget) and 45% by the waste producers via charges for waste management services. It is hoped that this approach may prevent illegal waste disposal.

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ROMANIA

Installations

Power reactors

Romania has only one NPP into operation. It is a CANDU 6 reactor with an electrical power output of 705 MWe, located at the Cernavoda site. Construction of five CANDU 6 reactor units started at Cernavoda in 1980 and stopped at different stages of advancement (e.g. 46% for unit 1) following the 1989 political changes. Subsequently, it was decided to concentrate on the completion of the first two units.

Unit	Type	Start of construction	First grid connection	End of design life
Cernavoda 1	CANDU 6	1980	1996	2026

Research reactors

Name	Thermal Power (kW)	Type	Status	Criticality
RP-01	0.00	TANK	decommissioned	
TRIGA II PITESTI - PULSED	500.00	TRIGA DUAL CORE	operational	1979
TRIGA II PITESTI - SS CORE	14,000.00	TRIGA DUAL CORE	operational	1979
VVR-S BUCHAREST	2,000.00	TANK WWR	SHUT	1957

The TRIGA reactors are operated by the Institute for Nuclear Research (ICN) in Pitesti. They are likely to remain in operation for at least 15 years. The VVR-S research reactor, operated by the Institute of Nuclear Physics and Engineering (IFIN-HH) in Magurele, Bucharest, was shut down in 1997 and is to be decommissioned. The reactors are licensed by the National Commission for the Control of Nuclear Activities (CNCAN).

Nuclear fuel plant

There is one plant at Pitesti manufacturing nuclear fuel for the CANDU reactor. The plant is owned and operated by a subsidiary of Societatea Nationala Nuclearelectrica (SNN) S.A., the state company that owns and operates the CANDU reactors at Cernavoda.

Spent fuel facilities

UNITS	SF elements/a	No. in storage (1999)	Storage type	Remarks
Cernavoda NPP (CANDU 6, 705MW(e))	~ 5000 (unit 1)	~ 12000	AR, Wet	AFR dry storage planned for 2005
VVR-S RR Bucharest	Shut down	226	AFR, Wet	Assess fuel assemblies status, extension of wet storage period as long as possible waiting for financial support
TRIGA RR Pitesti			AR, Wet	Routine return to USA (available until 2006)

Some 267 HLW TRIGA fuel pins were sent back to USA in 1999. Concerning neighboring countries, the transport via the Black Sea and River Danube of VVR 1000 and VVR 440 fresh fuel from Russia to Kozloduy NPP was licensed and performed during the year 2000; the shipments are planned to continue. The transport of VVR 1000 spent fuel on the Danube from Bulgaria to Russia is currently under licensing review.

Radioactive waste facilities

Cernavoda NPP

At the NPP there is treatment and interim storage of NPP operational solid RW (compacting or shredding), spent resin (ion-exchange), organic liquid RW and other solvents. Liquid waste is stored on-site in concrete tanks. The RW management strategy foresees the construction, starting no earlier than 2003, of a disposal facility plus associated treatment and conditioning plant near the Cernavoda NPP site to cater for operational LILW-SL.

IFIN-HH Magurele

The treatment facility caters for the majority of the country's institutional RW as well as RW from the research reactor. The waste is cemented in 200 l drums and moved to temporary storage on-site before transportation to Baita Bihor for disposal. Plans exist to upgrade this radioactive waste treatment facility.

ICN Pitesti

The facility treats the research reactor RW as well as waste from the fuel fabrication plant. All waste is stored on-site, either in steel drums (solid RW) or in steel tanks (liquid RW).

Baita Bihor

The national repository at Baita Bihor for LILW from non-fuel cycle sources consists of disposal in galleries of an abandoned uranium mine. The radioactive waste is first treated and conditioned, either at the institute IFIN-HH Magurele or at SCN Pitesti (only for waste produced by SCN). The repository started operating in 1985 and accepts LILW conditioned in concrete in 200 l steel drums. The facility is operated under the responsibility of IFIN-HH. The present capacity is sufficient for ~ 40 (waste from industry and research). However, the capacity could be increased by a factor of 5 – 10, which would enable LILW from other sources to be accepted (including decommissioning waste). Plans exist to upgrade the radioactive waste treatment station.

Uranium mining and milling

Uranium milling and ore processing activities are still continuing, though the industry is in decline. There are over 100 low-grade waste rock and ore dumps, and two mill tailings ponds. The policy for the waste from uranium mining is to assess the impact of each sterile dump and to take remedial measures in case that critical group exceeds the dose limits for members of the public for abandoned sites or dose constraints for licensed sites. The tailing ponds and the solid waste trench sited at the milling installation Feldioara should be closed according to international standards. Contaminated mine water and the liquid phase after milling is decontaminated by ion-exchange before being released into running surface waters. Waste from mining and milling processes are stored near their place of origin. The Rare Metals Autonomous Administration, under the authority of the Ministry of Industry and Trade, is involved in the prospecting and mining of uranium ore. It is also responsible for the management of waste resulting from its activities.

Legal, regulatory and organisational framework

Legislation

The Law on the Safe Conduct of Nuclear Activities was enacted in 1996. It was amended in 1998, inter alia increasing the independence of the regulatory body, the National Commission for the Control of Nuclear Activities (CNCAN). The Law aims to establish a comprehensive legal framework for the regulation, licensing and control of activities involving the peaceful use of nuclear energy. It applies to the design, construction, operation and decommissioning of nuclear installations. The Law is further applicable to ore extraction and the processing of uranium and thorium ores, and to production, supply and storage of nuclear fuels, radioactive materials and waste. These activities require a licence from CNCAN.

Furthermore, the Law sets out the legal requirements for radioactive waste management: the waste producer bears responsibility for the management of his radioactive waste, for the financial and material arrangements covering the collection, transport, treatment, conditioning and disposal of waste arising from his activities and the decommissioning of his facilities. Licensees must pay a contribution to the Radioactive Waste Management and Decommissioning Fund, which is not yet operational. Import of RW is forbidden, with the exemption of the re-importation of spent fuel that has been reprocessed overseas.

In August 2000, the new Fundamental Radiological Safety Norms entered into force, approved by the President of CNCAN. The norms endorse the Council Directive 96/29 EURATOM and are in accordance with the IAEA SS 115/1996 International Basic Safety Standards for the Safety of Radiation Sources.

Regulatory bodies

The National Commission for the Control of Nuclear Activities (CNCAN) is an independent organisation under the Ministry of Water and Environmental Protection that acts as a regulatory body responsible for the safety of all nuclear activities in Romania. It is responsible for all issues of nuclear safety associated with the siting, construction and operations of nuclear installations in Romania, as well as for quality assurance, radiation safety, safeguards, radioactive waste management, import and export of nuclear components and materials, physical protection, and on-site emergency preparedness. CNCAN is independent from ministries and organisations that have a role in the use and promotion of nuclear energy and reports directly to the government.

A significant recent change in responsibilities involves the transfer of the network for radiological protection monitoring from CNCAN to the Environmental Protection Department, involving a reduction in staffing at CNCAN of from 306 to 81. Other regulatory functions and funding are not affected.

Implementation

There are four bodies responsible for managing RW in Romania:

- the Nuclearelectrica Company – waste and spent fuel from Cernavoda NPP
- the Institute for Nuclear Research (ICN) – waste from the materials testing reactor and the fuel fabrication plant
- the Institute of Physics and Nuclear Engineering “Horia Hulubei” (IFIN-HH) – institutional waste and waste from the research reactor, and
- the National Uranium Company – mining and milling waste

The Centre of Technology and Engineering for Nuclear Projects (CITON) at Magurele is responsible for waste management activities that are not covered by the Canadian contract for the CANDU reactor. IFIN-HH Magurele is responsible for the treatment of all LILW produced in Romania except that originating from Cernavoda NPP and ICN Pitesti. Both CITON and ICN Pitesti are now incorporated in the new Autonomous Company for Nuclear Activities (along with the plant for production of heavy water).
The establishment of a National Waste Management Agency is foreseen (see below).

Financing

The Law on Nuclear Activities also established that each waste producer must demonstrate proper and sufficient financial arrangements as a pre-requisite to receiving a licence to operate. The Law stipulates that other specific laws will be developed on this topic in the future. Thus, a law on the establishing of a fund for the management of RW and decommissioning has been drafted by CNCAN and is currently under parliamentary review. The draft is based on the principle that all users of nuclear technology producing RW must contribute to the fund. For example, NPPs shall contribute 10% of the value of the electricity produced. The Fund is also financed from the state budget and other sources. This draft legislation furthermore provides for the establishment of a Radioactive Waste Management Agency, which would be responsible for administrating this Fund, establishing strategies in this field and co-ordinating actions undertaken. This Agency will report to the Ministry of Industry and Trade.

SLOVAKIA

Installations

Power reactors

On the two nuclear sites at Bohunice and Mochovce, the Slovak Republic has in operation six nuclear power reactors. At Bohunice, a prototype gas cooled heavy water moderated reactor called Bohunice A1 was operated for a short time in the 1970´s. The reactor was permanently shut down in 1977 after an accident that led to partial core damage and is now being decommissioned.

Site / NPP / Unit	Reactor type	Start of construction	First grid connection	End of design life
Bohunice A1	KS 150 Prototype gas cooled reactor	1958	1972	Shutdown in 1977
Bohunice V1 Unit 1	VVER 440/230	1974	1978	2008*
Unit 2	VVER 440/230	1974	1980	2010*
Bohunice V2 Unit 3	VVER 440/213	1976	1984	2014
Unit 4	VVER 440/213	1976	1985	2015
Mochovce Unit 1	VVER 440/213	1983	1998	2028
Unit 2	VVER 440/213	1983	1999	2029

* Slovak Govt. has declared that reactors to be shut down in 2006 and 2008 respectively

Spent fuel facilities

UNITS	SF elements/a	No. in storage (1999)	Storage type	Remarks
Bohunice				
A1 (GCHWMR)	(shut down in 1979)	-	AR, Wet	Last SF sent back to Russia in '99
1-4 (VVER-440)	~ 360	1135	AR, Wet	
		4752	AFR, Wet	Upgraded in 1999
Mochovce 1-2 (VVER-440)	~ 180		AR, Wet	Capacity for 6-7 years of operation

Radioactive waste facilities

Bohunice NPP

The LILW liquid and solid wastes from the VVER-440 reactors, presently stored at Bohunice, will be cemented into fibre-concrete containers; this "adapted" RW will then be disposed of at the new Mochovce shallow land repository. The waste packages will be prepared at the Bohunice Radioactive Waste Treatment and Conditioning Centre (BSC RAO) comprising a facility for sorting solid waste, an incineration facility for solid and liquid burnable waste, a supercompactor, a cementation facility for liquid RW treatment and a subsequent active grouting of solid RW in the fibrous reinforced concrete containers. BSC RAO was in active trial operations in the year 2000 and has been in commercial operations since early 2001 with two facilities for bituminization of concentrates (one in operation since 1994 and the second one since 2001). The owner / operator is S.E. VYZ. The Centre will also serve for other RW producers in Slovakia.

At the Bohunice A1 reactor, currently being decommissioned, there is temporary storage for liquid, solid and solidified RW. Liquid concentrates resulting from decommissioning operations are bituminised, whereas high-level and alpha contaminated liquid waste, for which disposal at the Mochovce repository will not be possible, will probably be vitrified and stored pending the availability of a deep disposal facility.

Liquid concentrates from the units at Bohunice are gradually being retrieved and treated in the facilities of S.E. VYZ.

Mochovce NPP

A new shallow land repository at Mochovce is undergoing active commissioning tests (2000). The facility is intended to receive the LILW from both Bohunice and the Mochovce NPP. The solid LILW operational waste from Mochovce NPP, after preliminary treatment, will be packed and transported to Bohunice Treatment Centre where it will be processed and cemented in fibre-concrete containers. The liquid waste will be treated on-site at Mochovce by cementation, also into fibre-concrete containers. In either case, disposal will be in the Mochovce shallow land repository.

The construction of a Radioactive Waste Treatment and Conditioning Centre for liquid radwaste is under evaluation and assessment at the Mochovce site. Construction of an interim spent fuel store is also under evaluation and assessment.

Uranium mining and milling

All uranium mining activities have ended, but the legacy is restricted to old exploratory workings and some 20 waste rock and ore dumps, total volume approximately 960000 m^3. Remediation of the affected areas is progressing.

Legal, regulatory and organisational framework

Legislation

The Law on the Peaceful Uses of Nuclear Energy entered into force in 1998. This law sets out principles governing the use of nuclear energy, including the principle of justification. It places particular emphasis on the safety of nuclear installations, radiation protection of the public and workers, physical protection and emergency preparedness. The Law provides that the use of nuclear energy is subject to licensing and sets out, in a comprehensive manner, the application procedure and requirements for licensing. Thus, the Law establishes requirements governing the construction, commissioning, operation and decommissioning of nuclear installations. It also contains provisions related to radioactive waste management and handling of spent fuel. In particular, it provides that the generator of such waste or fuel is responsible for its management until its transfer to an appropriate depository.

Regulation No. 67/1987 of the former Czechoslovak Atomic Energy Commission lays down the basic technical and organisational requirements for ensuring nuclear safety and the prevention of releases of radioactivity into the environment in the course of radioactive waste management. The Regulation sets out mandatory radioactive waste management procedures for organisations concerned and their staff during the design, commissioning, operation or decommissioning of nuclear facilities. It also establishes basic safety requirements for all steps of radioactive waste management, including collection, segregation, storage, treatment, conditioning, and disposal of such waste. The Nuclear Regulatory Authority (ÚJD) is preparing a series of regulations on, inter alia, safety requirements for design, commissioning and operation of nuclear facilities, radioactive waste and spent nuclear fuel management, and quality assurance of nuclear facilities.
A new version of the Atomic Energy Act, submitted to the Parliament in early 2000, proposes amendments affecting, inter alia, the competent authorities empowered to regulate nuclear and radiation safety matters and procedures to be followed in the event of a nuclear or radiological accident. The Bill also regulates matters not covered by existing laws such as off-site emergency preparedness, risk from natural radiation sources, public information, radiation protection of outside workers, protection of patients exposed for medical purposes, etc.

Regulatory bodies

The Nuclear Regulatory Authority (Úrad Jadrového Dozoru - ÚJD) of the Slovak Republic is the successor to the former Czechoslovak Atomic Energy Commission. It was established in 1993 by an Act that defines its responsibilities and tasks and grants it autonomy in nuclear safety matters. The ÚJD acts as a state regulatory body reporting directly to the government. The regulatory powers of the ÚJD cover inter alia:

- safety of nuclear installations;
- radioactive waste management, i.e. supervision of radioactive waste originating from nuclear installations and repositories for all types of radioactive waste;
- quality assurance programmes;
- transportation of nuclear material;
- spent nuclear fuel management
- decommissioning of nuclear installations.

The ÚJD carries out state supervision, through nuclear safety inspectors, in the areas within its jurisdiction. Technical support is provided by several institutions. The most important of these is the Nuclear Power Plant Research Institute that is involved in the research and development of nuclear safety. The responsibilities of the UJD have been enlarged owing to the commissioning and operation of NPP Mochovce, the waste treatment facilities at Bohunice, the near surface repository for low and intermediate level waste and extensive preparation for the modernisation of the two V-2 units at Bohunice NPP.

Implementation

In 1996, a branch of Slovak Electric, SE-VYZ, was created to handle the decommissioning of nuclear installations and the management of radioactive wastes and spent fuel. It presently also is responsible for interim storage of wastes and spent fuel and conditioning of wastes.

Until 1986, all SF from the Czechoslovak reactors was returned to the USSR after five years of cooling. Since then, these transports have ended, and therefore a new AFR storage facility was built at Bohunice, increasing the storage capacity for SF. The new storage capacity will be sufficient for the whole SF production by all Bohunice units. To solve the problem of long-term storage of SF from the units at Mochovce NPP, an interim storage facility may also be constructed at that site.

A new shallow LILW repository close to the site of the Mochovce NPP is presently undergoing active tests (2000). The operator is SE-VYZ. The development of a deep underground repository for HLW and spent fuel is at present at the start of the site selection process. For the time being, the responsibility lies with Slovak Electric Headquarters. It is planned for disposal operations to begin after 2030.

Financing

Act No. 254/1994, and Decree No. 14/1995 establish a State Fund for the decommissioning of nuclear power plants and the management of spent fuel and radioactive waste arising from their decommissioning. The Fund is managed by the Ministry of Economy. An amendment is underway of the Law on the State Fund for the decommissioning of nuclear power plants and the management of spent fuel and radioactive waste arising from their decommissioning.

The State Fund is financed by several means including contributions by nuclear power plant operators, bank and state funding. Thus, the NPP operators must pay contributions to this fund set at 10% of the market price of the electricity produced at the NPP. Further sources of the fund are state budget and fines imposed in the case of violation of atomic law or regulations by licence holder.

SLOVENIA

Installations

Power reactor

Slovenia has one nuclear power reactor with a net power output of 676 MWe, located at Krško. It was built as a joint investment by the electricity utilities of Slovenia and Croatia.

NPP	Reactor type	Start of construction	First grid connection	End of design life
Krško	Westinghouse 2-loop PWR	1974	1981	2023

Research reactor

Slovenia has one TRIGA Mark II research reactor at the Reactor Centre of the J. Stefan Institute, situated at Brinje, 15 km north-east of Ljubljana. The TRIGA reactor went critical in 1966 and was reconstructed in 1991 to enable a peak power of 1000 MW in pulse mode to be achieved as well as the earlier level of 250 kW in steady-state operational mode. The reactor is US-made and is presently state-owned. The licensing authority is the Slovenian Nuclear Safety Administration (SNSA). The final decision about the decommissioning of the research reactor is foreseen after year 2006.

Spent Fuel Storage Facilities

NPP Krško

UNITS	SF elements/a	No. in storage	Storage type	Remarks
Westinghouse PWR (632 MW(e)	~ 30	594	AR, Wet	Almost full.

The capacity of the pool is sufficient up to year 2003. In 2002, the capacity of pool will be increased by means of reracking and utilisation of unused section of the pool. After the refurbishment, the pool capacity will be sufficient to accommodate all spent fuel discharges until the end of the planned NPP lifetime in 2023 and beyond.

TRIGA Mark II RR, Brinje

In July 1999, 218 spent fuel rods and one damaged fresh fuel road (total 40 kgU) were returned to the USA. At present there are 94 fuel elements, approximately half in the reactor core and half in the fresh fuel storage. The research reactor has, according to contract with US DOE, an option to return this fuel to USA until May 2009.

Radioactive waste facilities

NPP Krško

The low level and intermediate level waste storage at the Krško NPP was originally designed only for the temporary storage of five years. A significant volume reduction of stored solid radioactive has been achieved which will provide enough space for all the waste that it is estimated will be produced during the operation life of the plant. For bigger components (steam generators) a new multipurpose building was built for safe storage until the decommissioning of the plant. This building also contains a decontamination area and storage for solid radioactive waste generated during the replacement of the steam generators in May 2000 (from WENRA report).

Central Interim LILW Storage at the Research Reactor Centre, Brinje

The facility provides interim storage of LIL solid radioactive waste from the reactor centre and other small waste producers, as medical, research organisations and industrial application of ionising sources. In 1999, the responsibility for operation of the interim storage was transferred from Jozef Stefan Institute to Agency for Radioactive Waste Management (ARAO). The interim storage facility is a concrete building covered with earth. At present the Central Interim Storage provides no treatment or conditioning, but the facilities are due to be modernised (plan to be implemented in 2001).

Zavratec Temporary Storage

This is where the radium-contaminated and other waste from the Oncological Institute in Ljubljana is temporarily stored. ARAO plans to close the Zavratec facility and relocate the radioactive waste in the central interim storage facility Brinje. Part of the relocation was accomplished in 2000.

Uranium mining and milling

All uranium mining activities have ended. The uranium mine Žirovski Vrh is being decommissioned after the Slovenian government decided on its closure in 1990 and issued the Act on Cessation of the Exploitation of the Uranium Mine (1992). The waste is stored at two sites, at the mill tailings site at Boršt and at the mining waste disposal site at Jazbec. Total volume of waste rock and ore in the 19 dumps is approximately 1.1×10^6 m ^{3}. The uranium mining legacy also includes two processing plants and a tailing pond. Government funded remediation activities are in progress at the affected sites.

Legal, regulatory and organisational framework

Legislation

The list of the acts regulating the nuclear fuel cycle facilities is the following:

- Act on radiation protection and nuclear installations safety measures (1980)
- Act on protection against ionising radiation and use of nuclear energy (1984)
- Act on permanent cessation of the uranium ore mining and prevention adverse effects of mining in the uranium mine Žirovski Vhr (1992)
- Act on establishing the fund for decommissioning of the Krško NPP and for the disposal of the radioactive waste of the Krško NPP (1994).

The main nuclear Act of 1984 on radiation protection and the safe use of nuclear energy is currently under review. The 1984 Act is supported by a set of second level regulations related to specific aspects of nuclear, radiation protection, waste and transport safety and on-site emergency preparedness. The licensing procedure is generally defined in the 1984 Act, and further developed, including licensing requirements and conditions, in second level regulation. All regulations on nuclear safety and on RW management are in accordance with internationally accepted principles and standards. Slovenia has ratified the Nuclear Safety Convention and the Joint Convention.

Regulatory bodies

The Slovenian Nuclear Safety Administration (SNSA), established in 1987, is responsible directly to the Ministry of Environment and Regional Planning, exercises control over nuclear safety and the granting of licenses for commissioning, operation and decommissioning of nuclear facilities. The Health Inspectorate at the Ministry of Health has responsibilities in the field of radiological protection. The SNSA's responsibilities are defined in an Act of November 1994 and include, inter alia:

- nuclear and radiological safety in nuclear installations;
- transport of nuclear and radioactive materials;
- physical protection of nuclear installations and materials
- licensing of operators and personnel of nuclear installations; quality assurance;
- radiological monitoring; inspections;

Thus, the SNSA is responsible for issuing and amending licences for all nuclear facilities and performs regular inspections at those facilities.

Implementation

The Slovenian Government established the Agency for Radwaste Management (ARAO) in 1991; its main task is to manage the final disposal of all types of RW in the Republic of Slovenia. The Agency's mandate was extended by the government in 1996 to include, inter alia, the management of a temporary storage facility for low and intermediate radioactive waste from small users (e.g. hospitals). It is also responsible for the operation of the interim storage for institutional waste at Brinje. The waste producers, the regulators and ARAO act independently of each other. No disposal of waste has yet taken place in Slovenia.

A recent CASSIOPEE report (PHARE funded) provides a detailed spent fuel and radioactive waste inventory comprising its volume and category, including waste and spent fuel currently in storage, and its expected future arising. The data were compiled on amounts and storage location of nuclear spent fuel, high-level, intermediate-level, and low-level radioactive waste, providing a description of their radiological properties, physical and chemical state. Waste management schemes including several options for LILW and for HLW disposal were proposed. Possible schemes of waste disposal at the Žirovski Vrh mine site were given, in view of forthcoming remedial actions at this site. A detailed analysis of contaminated waste from former mining and processing uranium ore was also performed.

In 2000, when ARAO took over the Brinje interim storage facility, a thorough analysis of the present state was performed. Reports on the conditions of the facility and stored inventory as well as recommendation for necessary remediation and modernisation were prepared. Based on these reports, a plan for remediation and modernisation of the storage facility at Brinje was prepared. The Slovenian Nuclear Safety Administration, SNSA, is currently reviewing the Plan and Safety Report that were prepared and submitted to SNSA by ARAO.

ARAO has prepared a draft national strategy for LILW management, which has been submitted to the Government for approval. The strategy comprises plans for pre-disposal conditioning, proper interim storage and construction of a repository, with a practical solution available possibly as early as 2007, or at the latest by 2010. In 1996, the Slovenian Government adopted a long-term strategy for spent fuel management that will be revised every three to five years. In line with other countries in the region, Slovenia had adopted a “wait and see” strategy - according to current policy, the decision on the siting of a nuclear spent fuel disposal facility can be deferred until the year 2020.

Financing

The 1993 Environmental Protection Act established in principle that the polluter should pay. At present this is confined to NPP Krško, but will soon be extended to small producers through the anticipated Decree on collecting, treatment and storage of institutional waste. However, historical waste will continue to be covered by the state budget. A Fund for decommissioning and waste disposal was established in 1994 (by the Act on funding the decommissioning of NPP Krško and the disposal of RW from NPP Krško). The purpose of the Fund is to collect money for future decommissioning and for the disposal of RW and SF. The Fund operates as an independent legal entity, but has been under-recovering because of the unresolved problem between Slovenia and Croatia concerning the legal status of the NPP (jointly constructed by the two countries). Until agreement is reached between the two countries, Slovenia executes the founder's rights and Croatia is treated as the co-investor. At present, payments to the Fund continue to be made only by Slovenia.

ARAO has in the past been funded wholly by the state but is now being co-financed by the Fund. NPP Krško makes a monthly payment into the Fund. The payment is calculated as a levy on electricity produced. Payments are scheduled to be made from 1995 to 2023 (the end of the NPP projected lifetime).

APPENDIX 2

STATUS OF CANDIDATE STATES AND MEMBER STATES VIS-À-VIS SELECTED INTERNATIONAL AGREEMENTS

Country	Early Notification Convention[1]	Convention on Emergency Assistance[2]	Convention on Nuclear Safety [3]	Joint Convention on the safety of spent fuel management and of radioactive waste management [4]
Austria	Ratification	Ratification	Ratification	Signature (17.09.98)
Belgium	Ratification	Ratification	Ratification	Signature (08.12.97)
Bulgaria	Ratification	Ratification	Ratification	Ratification (21.06.00)
Cyprus	Accession	Accession	Accession	
Czech Republic	Ratification	Ratification	Approval	Approval (25.03.99)
Denmark	Signature	Signature	Acceptance	Acceptance (03.09.99)
Estonia	Accession	Accession		Signature (05.01.01)
Finland	Approval	Approval	Acceptance	Acceptance (10.02.00)
France	Approval	Approval	Approval	Approval (27.04.00)
Germany	Ratification	Ratification	Ratification	Ratification (13.10.98)
Greece	Ratification	Ratification	Ratification	Ratification (18.07.00)
Hungary	Ratification	Ratification	Ratification	Ratification (02.06.98
Ireland	Ratification	Ratification	Ratification	Ratification (20.03.01)
Italy	Ratification	Ratification	Ratification	Signature (26.01.98)
Latvia	Accession	Accession	Accession	Acceptance (27.03.00)
Luxembourg	Ratification	Accession	Ratification	Signature (01.10.97)
Lithuania	Accession	Accession	Ratification	Signature (30.09.97)
Malta				
Netherlands	Acceptance	Acceptance	Acceptance	Acceptance (26.04.99)
Poland	Ratification	Ratification	Ratification	Ratification (05.05.00)
Portugal	Ratification	Signature	Ratification	
Romania	Accession	Accession	Ratification	Ratification (06.09.99)
Slovakia	Ratification	Ratification	Ratification	Ratification (06.10.98)
Slovenia	Ratification	Ratification	Ratification	Ratification (25.02.99)
Spain	Ratification	Ratification	Ratification	Ratification (11.05.99)
Sweden	Ratification	Ratification	Ratification	Ratification (29.07.99)
United-Kingdom	Ratification	Ratification	Ratification	Ratification (12.03.01)

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1 Parties: **86**, Signatories: **70**. Entered into force on 27 October 1986.

2 Parties: **82**, Signatories: **68**. Entered into force on 26 February 1987.

3 Parties: **53**, Signatories: **65**. Entered into force on 24 October 1996.

4 **Last change of status: 20 March 2001.** Contracting States: **25** Signatories: **42**
Adopted on 5 September 1997. Opened for signature on 29 September 1997
The Convention, pursuant to Article 40.1, "shall enter into force on the ninetieth day after the day of deposit with the Depositary of the twenty-fifth instrument of ratification, acceptance or approval, including the instruments of fifteen States each having an operational nuclear power plant.", i.e. 90 days after 20 March 2001.