

Report on the implementation of the Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste

R O M A N I A

1. INTRODUCTION

Under the current legislative and regulatory framework, spent fuel is considered either a reused resource which could be reprocessed or it could be disposed of as radioactive waste. The legislative and regulatory policies that govern radioactive waste in Romania implicitly include spent fuel. As a result, legislation and policies on managing radioactive waste apply equally to spent fuel as they do to other forms of radioactive waste.

The objective of Romanian radioactive waste management policy is to assure safe management of the spent nuclear fuel and the radioactive waste.

Romanian national policy is aligned with the fundamental principles for safe, secure and sustainable management of spent fuel and radioactive wastes, as generally expressed by international authorities including the European Commission and the IAEA. The obligations and the principles previewed by Waste Directive and Joint Convention are transposed into Romanian legislation: Law no. 378/2013 for amending and supplementing the Government Ordinance no. 11/2003 on the safe management of radioactive waste and the Law no. 111/1996 on the safe deployment, regulation, authorization and control of nuclear activities, CNCAN Order no. 217/2013 on amending and supplementing the Order no. 56/2004 on approving the fundamental norms on safe management of radioactive waste and Law no. 105/1999 on the ratification of Joint Convention on the safe management of spent nuclear fuel and on the safe management of radioactive waste.

The national policy is expressed across several laws, orders and regulations: notably in the medium and long-term National Strategy for spent fuel and radioactive waste management which is set out in Order 844/2004. The key principles that underpin the national policy and that are set out in the National Strategy are:

- The import, export and intra-Community transfer of radioactive wastes is prohibited subject to the following exemptions:
 - spent fuel from research reactors will be returned to the country of origin, under agreement;
 - the transfer of disused sealed sources, which must be returned to the supplier or manufacturer;
 - the transfer of radioactive waste for treatment or spent fuel for processing, with subsequent return of the waste produce for final disposal;
 - the transfer of radioactive waste or spent fuel to another country for final disposal but only when the receiving country has the technical and administrative capability to meet international standards.

- The generation of radioactive waste is to be kept to the minimum practicable level in terms of activity and volume through appropriate design measures, facility operation and decommissioning practices. To meet this requirement, the license holder must ensure:
 - selection and control of materials;
 - recycling and reuse of materials, including clearance of materials;
 - implementing adequate operating procedures, including those referring to the physical, chemical and radiological characterization of the waste and sorting of different type of materials.
- All spent fuel and radioactive wastes are to be safely managed using a graded approach, applying an appropriate combination of engineered systems and management controls.
- All spent fuel and radioactive wastes are to be managed according to an integrated strategy that addresses dependencies between all waste management steps which includes pre treatment, treatment, conditioning, storage, transport and disposal.
- Disposal is the last stage of the radioactive waste management system. Wastes are to be disposed with no intention to be retrieved, and without requiring long-term monitoring and maintenance. A graded approach is adopted with the disposal concept commensurate with the level of hazard posed by the waste:
 - spent fuel from power reactors will be directly disposed to a geological repository after an appropriate period of interim storage, together with other long-lived radioactive wastes;
 - short-lived operational, decommissioning and institutional wastes will be disposed to surface or near-surface facilities - the existing repository at Baita Bihor is expected to be closed around 2040 and a new, modern-standard surface repository is planned to be operational in around 2021.

- Facility decommissioning, waste management and disposal operations will be undertaken as soon as is reasonably practical to avoid placing an undue burden on future generations, and implementation programmes have been prepared with key milestone dates.

- The financial costs for waste management and disposal operations should be borne by the waste producers in accordance with the 'polluter pays' principle, and a statutory funding scheme is in place.

2. Summary

This report presents the current status of progress made with the implementation of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste. It has been prepared for the first time by the Romanian Nuclear Agency and for Radioactive Waste (ANDR) to meet the obligation to notify the European Commission on the content of the National Report under Article 14(1) of this Directive.

Romania has one nuclear power plant, CNE Cernavoda, equipped with five PHWR - CANDU-6 Canadian type reactors with a 705 MW(e) gross capacity each, in different implementation stages. Unit 1 and 2 are in commercial operation since December 1996, respectively November, 2007. The electricity annually generated by CNE Cernavoda Units 1 and 2 represents approximately 18% of the overall electricity production of Romania leading to approximately 5400 tHM to be unloaded during 30 years of operation. Units 3, 4 and 5 are under preservation, since 1992.

The legal representative of the nuclear power production sector in Romania is National Company "Nuclearelectrica" (SNN). SNN is a government owned company reporting to the Ministry of Economy, Department of Energy. The company has its Headquarters in Bucharest and two subsidiaries:

- CNE Cernavoda, the operator of Cernavoda NPP - Units 1 and 2;
- Nuclear Fuel Plant in Pitesti (FCN).

In the late of 1970's, Romania chose CANDU type reactor for its first nuclear power plant. The main reasons of the choice were the high safety features of this technology and the possibility to manufacture in Romania the nuclear fuel and the heavy water as well as part of the equipment for this type of NPP.

The fabrication of the CANDU nuclear fuel started in 1980, through the commissioning of a CANDU type Fuel Pilot Plant operating as a department of the Nuclear Research Institute Pitesti (ICN Pitesti). In 1994, AECL and Zircotec Precision Industries Inc. Canada qualified the Nuclear Fuel Plant (FCN) Pitesti as a CANDU 6 fuel manufacturer. The plant has a current production of 210 tons per year, respectively about 46 bundles per day. It supplies the fuel necessary for the operation of CNE Cernavoda Unit 1 and Unit 2.

Spent nuclear fuel is stored for 50 years in the Dry Storage Facility located on CNE Cernavoda site. The radioactive waste originated from operation is stored into the storage facility on site.

Nowadays in Romania there are three mining districts: Bihor in the NW, Banat in the SW and Suceava in the NE area of the country. The uranium ore mined in these areas is transported to a single processing plant in the central area of the country (Feldioara).

There is under operation a TRIGA research reactor which is owned by the State Owned Company for Technologies for Nuclear Energy through its subsidiary Institute for Nuclear Research (ICN Pitesti), under authority of Minister of Energy, Small and Medium -Sized Enterprises, and the Business Environment. It is foreseen that the spent nuclear fuel from TRIGA research reactor to be returned in origin country. The radioactive waste from operation of TRIGA research reactor as well as from research facilities on site are managed into the Radioactive Waste Treatment Plant. The LILW-LL as well as the high activity radioactive sources are stored into the Post Irradiation Examination Facility.

There is a VVR-S research reactor located in Magurele owned by National Research and Development Institute for Physics and Nuclear Engineering “Horia Hulubei” (IFIN-HH), which is under the coordination of the National Authority for Scientific Research - Ministry of Education, Research and Youth (ANCS). VVR-S research reactor is under decommissioning now. Spent nuclear fuel type C-36 was shipped back in origin country, in Russian Federation. The radioactive waste from decommissioning of VVR-S research reactor as well as the institutional radioactive waste is managed into the Radioactive Waste Treatment Plant.

In the NW part of the country, at Baita Bihor, is located a near surface repository which is operated for institutional radioactive waste.

3. Glossary and abbreviations

The following list provides definitions for names, terms and abbreviations, including those with specific Romanian usage.

ANDR	Agenția Nucleară și pentru Deșeuri Radioactive (Nuclear Agency and Radioactive Waste), the national agency with responsibility for implementing radioactive waste management and disposal
CNCAN	Comisia Nationala pentru Controlul Activitatilor Nucleare (National Commission for Nuclear Activities Control), the national authority with responsibility for regulation of nuclear activities
DICA	Depozitul Intermediar de Combustibil Ars, the MACSTORE type interim dry storage facility for spent CANDU fuel on the Cernavoda NPP site
DIDR	Depozitul Intermediar de Deșeuri Radioactive, the interim radioactive waste storage facility on the Cernavoda NPP site
DFDSMA	Depozitul Final de Deșeuri de Slabă și Medie Activitate (Final Repository for Low and Intermediate Radioactive Waste), the planned surface repository for LILW-SL to be built in the vicinity of the Cernavoda NPP
DNDR	Depozitul National de Deseuri Radioactive (National Repository Radioactive Waste), the operating repository at Baita Bihor used for the disposal of institutional LILW-SL
EC	European Commission
EIA	Environmental impact assessment
HEU	Highly enriched uranium (fuel)
HLW	High level waste (also high heat generating waste)
IAEA	International Atomic Energy Agency
ICN	Institutul de Cercetari Nucleare (Institute for Nuclear Research) at Pitesti, a leading national nuclear research institute and a subsidiary of RATEN
IFIN-HH	Institutul National de Cercetare-Dezvoltare pentru Fizica si Inginerie Nucleara Horia Hulubei (National Institute for R&D in Physics and Nuclear Engineering at Horia Hulubei), a leading national nuclear research institute
KPI	Key performance indicator
LEPI	Post irradiation examination laboratory at the RATEN ICN site.
LEU	Lightly enriched uranium (fuel)
LILW-LL	Low and intermediate level radioactive waste (long lived), non-heat generating wastes with half-lives > 30 years
LILW-SL	Low and intermediate level radioactive waste (short lived), non heat generating wastes with half-lives < 30 years
NPP	Nuclear power plant (reactor)
Nuclearelectrica	SN Nuclearelectrica SA, the company that owns the CANDU nuclear reactors at Cernavoda and the fuel manufacturing plant at Pitesti

RATEN	Regia Autonoma Tehnologii pentru Energia Nucleara (State Owned Company Technologies for Nuclear Energy), the national technical support organisation responsible for maintaining nuclear competence
RD&D	Research, development and demonstration
SEA	Strategic environmental assessment
TRIGA	Training, Research, Isotopes, General Atomics - a type of research reactor.
VLLW	Very low level waste
VVR-S	A type of water-cooled research reactor

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4. Reporting article by article

Article 4 - General principles

The main general aspects of radioactive waste management policy are presented below:

- The radioactive waste management, including the transport, shall be authorized, and shall be performed according to the provisions of the applicable laws and regulations, assuring safety of facilities, protection of human health and environment (including protection of future generations);
- The licensees have the responsibility for management of radioactive waste arising from operation and decommissioning of their own nuclear and radiological facilities, up to disposal. They shall bear the expenses related to the collection, handling, transport, treatment, conditioning, storage and disposal of the waste they have produced;
- The licensees shall pay the legal contribution to the Fund earmarked for management of radioactive waste and to the Fund for decommissioning of nuclear installations;
- CNCAN has the responsibility for radioactive waste regulatory policy;
- Nuclear Agency and for Radioactive Waste (ANDR) has the responsibility for disposal of the spent nuclear fuel and the radioactive waste, including those resulted from the decommissioning of nuclear and radiological facilities;
- Spent fuel produced by NPP's shall be stored for limited period in dry storage facilities; After the storage period, the spent nuclear fuel will be disposed of in a deep geological repository;
- Spent fuel produced by research reactors shall be returned back to origin countries;
- LILW-SL shall be disposed of in a near surface repository;
- VLLW could be disposed of in less complex arrangement than LILW-SL;
- LILW-LL shall be disposed in a deep geological repository;
- The import of radioactive waste is prohibited;
- The timing for decommissioning and radioactive waste disposal shall assure, as far as applicable, the requirements for not imposing undue burden on future generations;
- According to international agreements signed with neighbor countries, the protection of human health and environment beyond national borders shall be assured in such a way that the actual and potential health effects will be not more detrimental than those accepted for Romania.
- The discharge of gaseous and liquid radioactive effluents from any nuclear facility shall be limited, according to derived emission limits approved by CNCAN, and further reduced, according to optimization principle.
- By conditions set in the operating authorization, and by regulatory dispositions, the holder of authorization is requested to transfer the radioactive waste (including the spent sources) for treatment and disposal or long term storage at dedicated facilities.

- Any nuclear and major radiological facilities shall have a decommissioning generic plan; for new facilities, this requirement applies from the design stage, when the application for the siting authorization is submitted to CNCAN.

Thus it can be concluded that the obligations under article 4 of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

Article 5 - National framework

The Report on Romanian "National Programme" for spent fuel and radioactive waste management has been prepared by the Romanian Nuclear Agency and for Radioactive Waste (ANDR) to meet the specific obligation for the first time to notify the European Commission on the content of the National Programme under Article 15(4) of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste (the "Waste Directive").

The main document which sets out the approach to management of operational and decommissioning wastes, and the future need for additional facilities, including for final disposal is the medium and long-term National Strategy for spent fuel and radioactive waste management (Order 844/2004).

The licensing system is administered by CNCAN in cooperation with other governmental authorities (ministries and agencies) in such areas as environment, health, transport, labour, security, etc. The issues raised by these authorities are taken into account before licences are issued by CNCAN, providing that there is no conflict with the provisions of the Law and of the CNCAN regulations. All other licences granted by other governmental authorities are prerequisites to the CNCAN licences. An exception would be the environmental authorisation issued by the Ministry of Environment and Climate Changes after the issuance of the operation licence by CNCAN. The environmental agreement, issued by the same Ministry is however a prerequisite to the siting licence issued by CNCAN.

In Romania the nuclear regulatory framework is a pyramidal one and consists of three levels. In the top of pyramid there are laws, on the second level there are fundamental regulations on radiological safety and on the third level there are specific regulations, regulatory letters and CNCAN dispositions.

All the regulations issued by CNCAN are mandatory and enforceable. The regulations are developed in observance of relevant international standards and good practices.

The Law no. 111/1996 gives a list of authorities having attributions in controlling various aspects related to nuclear activities. Although their attributions and responsibilities are established by the legislation in force, CNCAN has also signed formal Memoranda of Understanding with each of these

organisations, for ensuring the prevention of potential gaps and overlaps in the implementation of their respective duties and responsibilities

The Ministry of Health is the central authority for public health. The main responsibilities of the Ministry of Health are to:

- authorize the introduction into the social and economic circuit, for utilization or consumption purposes by the population, of products that were subject to irradiation or which contain radioactive materials;
- authorize the introduction into the medical field, for medical treatment and diagnosis purposes, of sealed or unsealed sources, of ionizing radiation generating devices, and of pharmaceutical products containing radioactive materials;
- develop its own licensing and control regulation;
- organise the monitoring network of the contamination with radioactive materials of foodstuff, over the whole food chain, drinking water inclusive, as well as of other goods destined to be used by the population, according to the law.
- organise the epidemiological monitoring system of the health condition of the occupationally exposed workers, and of the hygiene conditions in units in which nuclear activities are carried out.

The Ministry of the Environment and Climate Change: within Government, is the central authority for environmental protection and has specific responsibilities in the environmental licensing and control of nuclear installations, including facilities for the management of spent fuel and radioactive waste.

The Ministry of Administration and Interior through the General Inspectorate for Emergency Situations in co-operation with all specialized bodies of the central and local public administration co-ordinates the preparedness and response in case of nuclear accident, in compliance with the provisions of the law.

The State Inspectorate for Boilers, Pressure Vessels and Hoisting Installations (ISCIR), subordinated to the Ministry of Economy, is responsible for the licensing and control of the pressure systems and equipment, including those used in nuclear and radiological installations, with appropriate consultation and collaboration with CNCAN.

The Nuclear Agency and for Radioactive Waste (ANDR), subordinated to the Ministry of Economy is responsible for:

- promoting the peaceful use of nuclear energy and the related research and development programmes,
- the coordination, at national level, of the disposal of spent nuclear fuel and of radioactive wastes, as well as for the coordination at the national

- level of the decommissioning activities implementation and the safe management of the radioactive waste and spent nuclear fuel.
- construction and operation of new disposal facilities for radioactive waste;
 - development of the National Strategy on Medium and Long Term on the Management of Spent Nuclear Fuel and Radioactive Waste including Disposal and Decommissioning of Nuclear and Radiological Instalations, issued in 2004,
 - development of the National Programme regarding safe management of the radioactive waste and of the spent nuclear fuel.

Thus it can be concluded that the obligations under article 5 of Council Directive 2011/70 Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

Article 6 - Competent regulatory authority

According to the provisions of Law no. 111/1996, CNCAN is the regulatory body, empowered with the regulation, licensing, and control of nuclear activities.

CNCAN is functionally separate from any other body or organisation concerned with the promotion or utilisation of nuclear energy or radioactive material, including electricity production and radioisotope applications, or with the management of spent fuel and radioactive waste. The responsibilities assigned to CNCAN by the Law are concerning solely the regulation, licensing and control of nuclear activities.

CNCAN reports to the Prime Minister, through the General Secretariat of the Government. CNCAN exercises its functions independently from the ministries and other authorities of the central public administration which are subordinated to the Government. The companies and organisations that operate or own the main nuclear and radiological installations are subordinated to the Ministry of Economy or to the Ministry of National Education.

CNCAN is chaired by a President nominated by the Prime Minister. The position of the CNCAN President is assimilated to that of State Secretary. The President of CNCAN, with the advice of the General Secretariat of the Government, organises the subsidiary structures of the divisions of CNCAN depending on actual needs and conditions of the activities of CNCAN. The organisational structure of CNCAN and the modifications thereof are approved by Governmental Decision.

As regards the financing, before November 2009, CNCAN was collecting money for its budget from fees charged for performing inspection activities and technical assessments and for granting licences, permits and authorisations and was self-financed. Starting with November 2009, all the money collected from taxes and tariffs for CNCAN activities have become revenue to the state budget and CNCAN is currently financed from the state budget through the General Secretariat of the Government.

Law 111/1996 (as amended by Law 378/2013) on the safe deployment, regulation, licensing and control of nuclear activities, provides the primary legislative framework governing the safety of nuclear installations, including those for the purpose of radioactive waste and spent fuel management. This law provides the legal basis for the national nuclear regulatory authority (National Commission for Nuclear Activities Control, CNCAN) to perform its duties. Specifically the law provides for:

- a system of licensing of radioactive waste and spent fuel management activities;
- a system to prohibit the operation of facilities without a licence (sanctions may apply in such situations);
- a system of safety requirements and regulations for radiation safety;
- a system to enforce appropriate control, regulatory inspection, documentation and reporting;
- the enforcement of regulations and of the conditions of licenses.

Under its authority, CNCAN has issued a number of regulations that implement Government policy objectives set out in primary legislation, and provides for control over certain aspects of radioactive waste and spent fuel management. The list of regulations issued by CNCAN is provided in Section 6 References and supporting documentation.

Thus it can be concluded that the obligations under article 6 of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

Article 7 - Licence holders

According to the Law no.111/1996, the prime responsibility for the safety of a nuclear or radiological installation rests with the licence holder. This general responsibility includes the responsibility for the management of the spent fuel and of the radioactive waste generated within the practice, and the responsibility for decommissioning of the facility.

The main responsibilities of the licence holder for any spent fuel or radioactive waste management facility are the following:

- to ensure and maintain nuclear safety, protection against ionizing radiation, physical protection, emergency plans in case of nuclear accidents, quality assurance for the licensed activities, and records of nuclear and radioactive materials;
- observance of the technical conditions and limits included in the licence and reporting of any violation, in accordance with specific regulations;

- development of its own system of requirements, regulations, and instructions ensuring the implementation of the licensed activities without any kind of unacceptable risks ;
- to bear the expenses related to the collection, handling, transport, treatment, conditioning, storage and disposal of its wastes;
- to bear the expenses related to the decommissioning of its nuclear or radiological facility;
- to ensure adequate staff to carry out the licensed activities.

The main license holders generating radioactive waste and spent fuel are:

- Nuclearelectrica, the owner of the Cernavoda nuclear power plant and the fuel manufacturing plant at Pitesti;
- National Institute for Research and Development of Physics and Nuclear Engineering-Horia Hulubei (IFIN-HH), responsible with institutional waste management and disposal;
- Institute for Nuclear Research (ICN) Pitesti, the owner of TRIGA research reactor and post irradiation laboratory.

Thus it can be concluded that the obligations under article 7 of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

Article 8 - Expertise and skills

According to the Romanian Law no.111/1996 the licence for any facility is granted only if the applicant meets the following requirements:

- proves the professional qualification for each position of its staff;
- has insurance or any other financial guarantee to cover his responsibility for nuclear damages;
- has financial arrangements for safe management of its own radioactive wastes and for decommissioning of its installation.

The law mentioned above imposed a system of individual permits for each person employed for works with radioactive materials or in radiation fields. The permits are issued based on training and examination by the competent authorities or, by licensee, as approved by CNCAN.

The Final Safety Analysis Report for CNE Cernavoda Unit 1 and Unit 2 which are periodically updated during plant lifetime must contain special provisions with respect to plant organizational structure, experience and training for the key plant personnel, assurance that minimum plant complement (operations, technical, maintenance, etc.) is always in place; the plant training programs are also extensively assessed by CNCAN through periodic audits.

Thus it can be concluded that the obligations under article 8 of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

Article 9 - Financial resources

Adequate human and financial resources to support the plant safety are prerequisites to obtain and maintain the operating licence.

Similar requirements for getting an operation licence are established by CNCAN for reactors and for other facilities, including spent fuel and radioactive waste management facilities.

In addition, CNE Cernavoda has to pay yearly legal contributions to the Fund earmarked for management of radioactive waste and to the Fund for decommissioning of nuclear installations. This contribution shall be paid for each unit.

The small producers pay to IFIN HH or ICN for the services including disposal.

At CNE Cernavoda, the costs of current spent fuel and radioactive waste management activities including the costs associated with the commissioning of the Intermediate Spent Fuel Dry Storage Facility are included in the CNE Cernavoda operational costs.

The amount of the contributions which must be paid yearly by the SNN / CNE Cernavoda for decommissioning of nuclear facilities and for long term management of spent nuclear fuel and radioactive waste is determined as follows:

a) By multiplying the net quantity of electricity expected to be produced by each nuclear unit in the next year with a tariff of 0.60 euro / MWh, for establishing the financial resources necessary for the decommissioning of each nuclear unit;

b) By multiplying the net quantity of electricity expected to be produced by each nuclear unit in the next year with a tariff of 1.40 euro / MWh, for establishing the financial resources necessary for the siting, design, construction, commissioning, operation and maintenance, upgrading, closure and post closure monitoring of final repositories for radioactive waste generated by the operation of the nuclear units, for research and development activities to support the final disposal activities and for the current and capital expenditure of ANDR, according to annual revenue and expenditures approved by law.

The financial resources for operation, maintenance, upgrading, closure and post closure monitoring of DNDR Baita Bihor, decommissioning of research reactors and management of the institutional radioactive waste, in present they are assured from:

- the state budget ;

- economic contracts with radioactive waste producers from all over the Romanian territory.

Thus it can be concluded that the obligations under article 9 of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

Article 10: Transparency

Government Decision 564/2006 transposes Directive 2003/35/EC and provides for public participation in the drawing up certain plans and programmes relating to the environment, and so require an SEA. The National Programme falls under this regime.

Government Decision 445/2009 sets out the permitting regime for public and private developments which may have a significant environmental impact, and so require an EIA. The development of a new radioactive waste management facility would fall under this regime.

Order 135/2010 sets out the EIA methodology. Procedures for both SEA and EIA require stakeholder engagement and public hearings. Stakeholders may address questions related to the project and its potential impacts on the environment both in writing (during the consultation phase) or verbally (during the public hearing). The developer is required to address the stakeholder's questions in a revised EIA report.

If a proposed development has a potential transboundary impact, Order 864/2002 will apply which transposes the Espoo Convention. If changes to radioactive waste disposal or discharge practices form part of a proposed development, then an Euratom Treaty Article 37 submission will also be required to determine whether this will result in radioactive contamination of another member state. Under both the Espoo Convention and Article 37, potentially impacted countries may participate in the EIA stakeholder engagement processes.

Romania has participated in several international projects related specifically to public and stakeholder engagement in radioactive waste disposal programmes, including:

- IPPA: Implementing public participation approaches in radioactive waste disposal
- COWAM2: Community Waste Management Phase 2
- CIP: COWAM in Practice

Recommendations from these international projects are applied to the siting of the planned new surface repository for LILW-SL anticipated to be constructed in the general area of the Cernavoda site. Site investigations began in 1992 but did not involve the public. Within the environmental permitting process, public engagement is not mandatory in the early stages. But learning from COWAM2, a

systematic dialogue process was established in 2004 between representatives of the local community and local authorities, and of the nuclear industry. This dialogue has addressed key themes including health monitoring and environment surveillance, and community benefits.

Public engagement for the geological disposal programme has adopted the recommendations from the IPPA project, and a Romanian Stakeholders Group has been established that involves representatives from industry, government, national agencies (including CNCAN and ANDR) and non-governmental organisations. The siting methodology has not yet been established and, consequently, there can be no potential host communities involved at this stage. The proposed strategy for further public engagement in the geological disposal programme requires:

- the implementer (ANDR) should propose a 'vision' for the public participation process;
- the Romanian Stakeholders Group should debate the vision and produce recommendations for improvement to transform it in a strategy;
- an independent facilitator should moderate the discussions on the strategy;
- public engagement will follow once a siting programme is implemented.

Thus it can be concluded that the obligations under article 10 of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

Articles 11 and 12- National programmes

The National Programme report explains the current spent fuel and radioactive waste management activities, and the strategy and programme for implementing future activities leading to disposal. It is based on Order 844/2004 but also incorporates more recent decisions and developments, notably the transposition of the Waste Directive into Romanian Law (Law 378/2013) and revisions to certain milestones dates contained in the National Strategy. Although this report presents an update on the current situation in Romania, and sets out future plans and programmes, it does not replace the statutory laws and regulations which continue to remain in force.

The Romanian National Programme will continue to evolve as decisions are made and new waste management facilities are implemented. Significant changes to the National Programme will be notified to the Commission in accordance with Article 13(1) of the Waste Directive.

Government Ordinance 11/2003 (as amended by Law 378/2013) sets out the responsibilities of the organisations involved with radioactive waste management, and for implementation of the National Programme. These are:

Romanian Government:

- retains ultimate responsibility for, and guarantees, the decommissioning of nuclear facilities, and the safe management of radioactive wastes and spent fuel generated within Romania;
- holds (via ANDR) all rights and obligations arising under national law and international conventions and treaties relevant to radioactive waste and spent fuel management, to which Romania is a party;
- approves by Government Decision the means for establishing and managing the financial resources (funds) necessary for the safe implementation of the National Programme.

Ministry of the Environment and Climate Change:

- within Government, is the central authority for environmental protection and holds specific responsibility for the licensing and control of nuclear installations, including management of radioactive waste and spent fuel.

The Ministry of Economy, Commerce and Tourism:

- within Government, is the central authority responsible for approving the National Programme and ensuring it is implemented (by ANDR).

National Commission for Nuclear Activities Control (CNCAN):

- is the nuclear safety and security regulatory authority of Romania, responsible for the regulation, licensing and control of all nuclear activities;
- is empowered to issue licences for the operation of sites and facilities, to perform assessments and inspections to verify compliance with safety requirements and to take any necessary enforcement actions;
- reports to the Prime Minister through the General Secretariat of the Government.

Nuclear Agency and for Radioactive Waste (ANDR):

- is the competent national authority responsible for planning and implementing the National Programme, including disposal of radioactive waste and spent fuel, and for coordinating the pre-disposal management of radioactive wastes and spent fuel from operations and decommissioning;
- is responsible for the preparation and periodic revision (at least once every five years) of the National Strategy for radioactive waste and spent fuel management, and for monitoring its implementation;
- is responsible for the establishment and maintenance of a national inventory of radioactive wastes and spent fuel;

- is responsible for the preparation of RD&D programmes necessary to implement the National Programme, and benefits from the results of those programmes;
- is responsible for the recovery, treatment and disposal of orphan sources, historic wastes resulting from past practices, and wastes resulting from accidents or nuclear incidents;
- is responsible for the management and disposal of radioactive wastes and radiation sources, including the decommissioning of their nuclear installations, in cases where an operator is bankrupt, in liquidation or their financial resources resulting from judicial liquidation are insufficient;
- is responsible for the management of the financial resources (national funds) to cover the full costs for disposal of all radioactive wastes and spent fuel - this includes periodically updating the cost estimates, and ensuring adequate funds will be available by setting appropriate fees to be paid by waste producers;
- is independent from a functional perspective of the regulatory authority CNCAN, and the nuclear license holders;
- reports to Government via the Ministry of Economy.

The license holders generating radioactive waste and spent fuel:

- are responsible, in accordance with their licence conditions and in a manner consistent with the National Strategy, for pre-disposal management of all radioactive wastes and spent fuel resulting from the operation and decommissioning of their sites and facilities;
- are required to finance all pre-disposal management activities including collecting, sorting, treatment, conditioning, storage and transportation to final disposal of the radioactive wastes and spent fuel resulting from the operation and decommissioning of their sites and facilities;
- are required to contribute to raising the financial resources for safe disposal of radioactive waste and decommissioning of nuclear and radiological installations.

Technical support organisation (RATEN):

- is the national strategic state-owned organisation in the nuclear field;
- provides technical support and performs research, including for radioactive waste management and disposal; to support national institutions; and
- develops and maintains technical competence, and provides training, in the nuclear field.

The National Authority for Scientific Research and Innovation (ANCS):

- within Government (the Ministry of Education and Research), is the specialist body responsible for implementing the national policy for scientific research, technological development and innovation, including in the nuclear field.

Thus it can be concluded that the obligations under articles 11 and 12 of Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste are met by Romania.

5. ANEXA: Waste inventory

The largest producer of spent fuel and radioactive waste in Romania, by far, is the Cernavoda NPP. There are currently no disposal routes available for any of these wastes and, consequently, they are all stored on site. This means that the majority of the existing national inventory by both activity and volume is now stored on the Cernavoda site (see Section 3).

Other significant waste producers are the IFIN-HH and RATEN ICN research sites. The general approach at these sites is that LILW-SL is disposed to the operating repository at Baita Bihor (see Section 3.1.2). The only wastes that are stored at IFIN-HH and RATEN ICN are institutional wastes that do not meet the waste acceptance criteria for the Baita Bihor repository.

Table 3 (over page) provides a summary of the quantities of spent fuel and radioactive waste in the national inventory, reported for:

- the statutory waste classes for each waste producer (site); and
- current quantities and best estimates for future quantities that will arise both from operations and decommissioning.

The future quantities are based on the assumptions that (i) there will be 4 CANDU reactors, each operational for a period of approximately 50 years, (ii) all spent fuel will be directly disposed to a geological repository, and (iii) decommissioning of the reactors will take place promptly within a few years of defuelling.

Quantities are reported as either raw (untreated) arisings or as conditioned volumes in cases where the treatment and packaging methods are known or can be reasonably assumed. The waste acceptance criteria and packaging requirements for the future geological repository are not known, and so quantities of spent CANDU fuel are given as tonnes of U metal.

The quantities of VLLW are included within the estimates for LILW-SL. The largest quantities of VLLW will arise from decommissioning of the CANDU reactors but reliable estimates have not yet been made because this will depend on future decisions regarding techniques for the segregation of VLLW from other decommissioning LLW waste streams.

The reference date for this inventory is December 2013, which is also the reference date for the inventory reported in the latest (5th) Joint Convention report, for consistency.

Table with the summary inventory of spent fuel and radioactive waste quantities in Romania.

Waste producer	Waste class	Current quantities	Future quantities		Total quantity	Brief description of waste materials
			Operation/ refurbish	Decommission		
SPENT FUEL						
Cernavoda NPP Units 1&2	HLW	2,289 tonnes U metal	7,911 tonnes U metal	-	10,200 tonnes U metal	CANDU fuel
Cernavoda NPP Units 3&4	HLW	-	10,200 tonnes U metal	-	10,200 tonnes U metal	CANDU fuel
RATEN ICN	HLW	0.001 tonnes U metal	0.35 tonnes U metal	-	0.35 tonnes U metal	TRIGA LEU fuel
		0.055 tonnes U metal	0.15 tonnes U metal	-	0.20 tonnes U metal	CANDU fuel rods
Total quantity of spent fuel for geological disposal					20,400 tonnes U metal	

LILW-LL						
Cernavoda NPP Units 1&2	LILW-LL	-	450 m ³ Cond.	580 m ³ Cond.	1,030 m ³ Cond.	Operational, refurbishment and decommissioning wastes
Cernavoda NPP Units 3&4	LILW-LL	-	450 m ³ Cond.	580 m ³ Cond.	1,030 m ³ Cond.	Operational, refurbishment and decommissioning wastes
RATEN ICN	LILW-LL	0.5 m ³ Raw	5 m ³ Cond.	100 m ³ Cond.	105 m ³ Cond.	Institutional and decommissioning wastes
IFIN-HH	LILW-LL	4 m ³ Raw	10 m ³ Cond.	60 m ³ Cond.	70 m ³ Cond.	Institutional and decommissioning wastes
Total quantity of LILW-LL for geological disposal					2,235 m³ Cond.	

LILW-SL						
Cernavoda NPP Units 1&2	LILW-SL	650 m ³ Raw	7,000 m ³ Cond.	7,100 m ³ Cond.	14,700 m ³ Cond.	Operational, refurbishment and decommissioning wastes
Cernavoda NPP Units 3&4	LILW-SL	-	7,650 m ³ Cond.	7,100 m ³ Cond.	14,700 m ³ Cond.	Operational, refurbishment and decommissioning wastes
Total quantity of operational LILW-SL for disposal at DFDSMA					29,500 m³ Cond.	

IFIN-HH/ RATEN ICN	LILW-SL	22 m ³ Cond.	78 m ³ /year Raw	1,900 m ³ Cond.	2,870 m ³ Cond.	Institutional & Decommissioning waste
Baita Bihor Repository	LILW-SL	2,130 m ³ Disposed			5,000 m ³ total capacity	Institutional & Decommissioning waste
Total quantity of institutional LILW-SL for disposal at Baita Bihor repository					2,870 m³ Cond.	

6. References and supporting documentation

Romanian laws, orders and regulations

Law 111/1996 on the safe deployment, regulation, authorization and control of nuclear activities, republished with subsequent completion and modification.

<http://www.cncan.ro/legislatie/legi/>

Law 105/1999 on the ratification of Joint Convention on the safe management of nuclear fuel and on the safe management of radioactive waste.

<http://www.agentianucleara.ro/legislatie/LEGE%20nr%20%20105%20din%201999.pdf>

Law 378/2013 for the transposition of Council Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste.

<http://www.agentianucleara.ro/wp-content/uploads/2010/05/LEGE.pdf>

Government Ordinance 11/2003 regarding the management of nuclear spent fuel and radioactive waste, including their disposal, with subsequent modifications and completions.

<http://www.agentianucleara.ro/legislatie/OG%20nr.%2011%20din%202003.pdf>

Government's Decision 1259/2002, regarding the approval of the National Strategy for the development of the nuclear field in Romania and of the plan of action for the implementation of this strategy.

<http://www.agentianucleara.ro/legislatie/HG%20nr.1259%20din%202002.pdf>

Government Decision 600/2014 on approving the National Strategy on Nuclear Safety and Security .

<http://www.cncan.ro/informatii-de-interes-public/strategii-planuri-programe/strategia-de-securitate-nucleara/>

Government Decision 564/2006 regarding the framework of public participation in elaborating certain plans and programs.

<http://lege5.ro/Gratuit/ha2timjq/hotararea-nr-564-2006-privind-cadrul-de-realizare-a-participarii-publicului-la-elaborarea-anumitor-planuri-si-programe-in-legatura-cu-mediul>

Government's Decision 1080/2007 regarding the constitution and management of financial resources necessary for the safe management of waste.

<http://www.agentianucleara.ro/legislatie/HG%20nr.%201080%20din%202007.pdf>

Government Decision 445/2009 on environmental impact assessment pertaining to certain public and private projects.

http://www.anpm.ro/documents/12220/2054068/HG.+445_2009+privind+evaluarea+impactului+anumitor+proiecte+publice+si+private+asupra+mediului.pdf/f1a35934-96d5-4167-bdc5-337454661ca3

Order 864/2002 for approving the Procedure for Environmental Impact Assessment in a Transboundary Context and public participation in decision-making for projects with transboundary impact.

Order 844/2004 for approving the National Strategy on medium and long-term management of spent nuclear fuel and radioactive waste, including final disposal and decommissioning of nuclear facilities.

<http://www.agentianucleara.ro/legislatie/Ordin%20nr.%20844%20din%202004.pdf>

Order 135/2010 for approving the methodology for implementing environmental impact assessment for public and private projects.

http://www.anpm.ro/documents/12220/2054068/HG.+445_2009+privind+evaluarea+impactului+anumitor+proiecte+publice+si+private+asupra+mediului.pdf/f1a35934-96d5-4167-bdc5-337454661ca3

The list of regulations issued by CNCAN:

<http://www.cncan.ro/legislatie/norme/>

Other references

CNCAN (2014) Romania. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The Fifth National Report.

<http://www.cncan.ro/informatii-de-interes-public/rapoarte/rapoarte-conventii/>

IAEA (2009) Classification of Radioactive Waste. IAEA Safety Guide, GSG-1.