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Proposal for a

**COUNCIL DIRECTIVE**

**on the management of spent fuel and radioactive waste**

SEC(2010) 1290  
SEC(2010) 1289

## EXPLANATORY MEMORANDUM

### 1. CONTEXT OF THE PROPOSAL

#### 1.1. Background and objectives of the proposal

Following the successful adoption of the Nuclear Safety Directive, the elaboration of a revised proposal for legislation on the management of spent fuel and radioactive waste is included in the Commission's work programme 2010 (item 2010/ENER/021).

The proposed Directive sets out an EU legal framework for spent fuel and radioactive waste management. It revises the Commission proposal for a Council (Euratom) Directive on the management of spent fuel and radioactive waste<sup>1</sup>.

All Member States have radioactive waste. It is generated by many beneficial activities, such as electricity production in nuclear power plants and a range of radioisotope applications in medicine, industry, agriculture, research and education.

The operation of nuclear reactors also generates spent fuel. There are currently two options for managing the spent (i.e. irradiated) fuel: reprocessing to recover plutonium and uranium for possible re-use, or interim storage and eventual direct disposal if the spent fuel is considered as waste as part of national policy. However, even if spent fuel is reprocessed<sup>2</sup>, there is still 'ultimate waste', i.e. the separated vitrified residues containing the unrecycled fraction, that also needs to be disposed of. More than half of Member States operate nuclear power plants. There are nuclear reactors under construction and being decommissioned, as well as plans for new builds in a number of Member States.

Depending on the characteristics of the waste (i.e. radionuclide content) specific arrangements are required to protect humans and the environment against dangers arising from ionizing radiation. The basic principle of radioactive waste management is containment and isolation from humans and the biosphere for as long as the waste represents a radiological hazard. This hazard diminishes over time as a result of radioactive decay. Isolation is ensured by a series of engineered barriers and, in the case of longer-lived waste, also by the properties of the host rock.

Radioactive wastes are classified into low-, intermediate-, and high-level waste depending on their level of activity. A distinction can also be drawn between short-lived and long-lived radioactive wastes<sup>3</sup>. Short lived Low and Intermediate Level Waste (LILW) is typically disposed in near surface disposal facilities. For High Level Waste (HLW), by contrast, there is a world-wide scientific and technical consensus that deep geological disposal represents the safest and most sustainable option<sup>4</sup>.

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<sup>1</sup> Initial 2003 Commission proposal (COM 2003/32 final) and revised 2004 version (COM (2004)526 final)

<sup>2</sup> By both current and advanced fuel cycle practices

<sup>3</sup> Commission Recommendation of 15 September 1999 on a classification system for solid radioactive waste, OJ L 265, 13.10.1999, p.37.

<sup>4</sup> OECD-NEA Radioactive Waste Management Committee: "*Collective Statement on Moving Forward to Geological Disposal of Radioactive Waste*", ISBN 978-92-64-99057-9

In the EU, more than 85% of the generated volume of radioactive waste constitutes short lived LILW, about 5% long lived LILW and less than 10% HLW, which includes both vitrified waste from reprocessing and spent fuel considered as waste.<sup>5</sup>

Whatever the future of nuclear power and non-power applications, the implementation of disposal as the end point in the management of existing and future radioactive waste is needed in order to assure safety in the long term.

Temporary storage is an important stage in the overall management of radioactive waste, in particular for spent fuel and HLW, allowing effective cooling and radiation levels to decrease thereby making handling safer. However, there is also a broad consensus that storage of spent fuel and radioactive waste, including long-term storage, is only an interim solution requiring active and permanent institutional controls. In the longer term, only disposal with its inherent passive safety characteristics can guarantee protection against all potential hazards.

Ultimate responsibility for the management of spent fuel and radioactive waste rests with the States. Furthermore, it is an accepted ethical principle that the society should avoid imposing undue burdens on future generations, and this places the onus on the current generation, who has benefited from nuclear electricity or medical interventions, to manage appropriately all existing waste.

Despite these considerations, most countries have yet to take key decisions regarding the management of spent fuel and radioactive waste. This is particularly true for spent fuel and HLW; only a handful of Member States have well established programmes to implement disposal. The consequences of the delay are that burdens will be passed on to future generations, both to implement disposal as well as maintaining interim storage options. The associated risks are evident – unavailability of financing, lack of expertise, disruption as a result of unforeseen societal upheaval, terrorist threats, etc.

Safe management of radioactive waste and spent fuel, at all stages from generation to disposal, requires a national framework that guarantees political commitments, a clear allocation of responsibilities, and ensuring that sufficient scientific, technical and financial resources are available when needed. Given the highly sensitive nature of the issue, public information and participation in the decision-making processes has also to be ensured.

The general objective of this proposal is therefore to set up an EU legal framework for the management of spent fuel and radioactive waste as an integral part of the safe use of nuclear energy for electricity production and of the ionizing radiation in medicine, industry, agriculture, research and education.

In order to achieve the general policy objective, it is necessary:

- to ensure that workers and the general public are protected against dangers arising from ionizing radiation now, in the future and beyond national borders;
- to implement the highest safety standards for radioactive waste and spent fuel management;
- to avoid imposing undue burdens on future generations;

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<sup>5</sup> Report from the Commission to the European Parliament and the Council: Sixth Situation Report on Radioactive Waste and Spent Fuel Management in the European Union, COM(2008)542 final and SEC(2008)2416

- to achieve sustained political commitment to the management of spent fuel and radioactive waste in the long term;
- to ensure transposition of the political decisions into clear provisions for the implementation of all steps on radioactive waste and spent fuel management from generation to disposal;
- to achieve and maintain continuing improvement of the management system, based on stepwise decision-taking and social acceptance;
- to ensure adequate and transparently managed financial resources, available when needed, in accordance with the 'polluter-pays' principle.

## **1.2. Existing legal instruments affecting the management of radioactive waste and spent fuel; subsidiarity**

Community competences regarding spent fuel and radioactive waste arising from civil nuclear activities fall under the framework of the Euratom Treaty. Article 2(b) of the Euratom Treaty provides for uniform safety standards to be set to protect the health of workers and of the general public. Article 30 provides for basic standards within the Community to be set to protect workers and the general public against the dangers arising from ionizing radiations, and Article 37 requires Member States to provide the Commission with general data on any plan for the disposal of radioactive waste.

As recognised by the Court of Justice of the European Union in its case-law, the provisions of Chapter 3 of the Euratom Treaty, on health and safety, form a coherent whole conferring upon the Commission powers of some considerable scope in order to protect the population and the environment against risks of nuclear contamination<sup>6</sup>. Based on the Court's landmark ruling C-29/99, the existing basic safety standards aiming mainly at the protection of the health of workers and the general public against the dangers arising from ionizing radiations can be 'supplemented' within the meaning of the Euratom Treaty with safety requirements governing the safe management of radioactive waste and spent fuel.

The issue of spent fuel and radioactive waste management is clearly an area where national legislation has to be supplemented by legislation at EU level owing to the cross-border aspect of safety. At the same time the internal market requires the Commission to ensure a level-playing field to avoid distortion of competition.

However, existing European legislation does not cover all activities and facilities relating to the management of spent fuel and radioactive waste. Aspects such as national policies and their implementation, and public information and participation in the decision-making process are not included.

The recently adopted Council Directive establishing a Community framework for the nuclear safety of nuclear installations (Nuclear Safety Directive)<sup>7</sup> only covers spent fuel storage facilities and other storage facilities for radioactive waste that are on the same site as and are directly related to nuclear installations. However, it states that it is also important to ensure the safe management of spent fuel and radioactive waste, including at storage and disposal

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<sup>6</sup> C-187/87 (1988 ECR p.5013) and C-29/99 (2002 ECR p. I-11221)

<sup>7</sup> Council Directive 2009/71/Euratom, OJ L 172, 2.7.2009, p. 18–22

facilities. Thus, the proposed Directive on the management of spent fuel and radioactive waste is a logical next step after the Nuclear Safety Directive.

Other EU legal instruments relevant to the management of spent fuel and radioactive waste are Community arrangements for the early exchange of information in the event of a radiological emergency<sup>8</sup>, the control of high-activity sealed radioactive sources and orphan sources<sup>9</sup>, including disused sources, the management of waste from extractive industries<sup>10</sup> (not covering aspects related to radioactivity), and the supervision and control of shipments of radioactive waste and spent fuel<sup>11,12</sup>. There is also a Commission Recommendation on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste<sup>13</sup>.

At the international level, there are safety standards developed in collaboration with other organisations by the International Atomic Energy Agency (IAEA) that are not legally binding and for which incorporation into national legislation is voluntary. All EU Member States are members of the IAEA and participate in the adoption of these standards.

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, concluded under the auspices of the IAEA, is the most significant international agreement in its field. However, there are no sanctions for non-compliance. Therefore, even though all EU Member States (except Malta) and the Euratom Community are contracting parties, the internationally accepted principles and requirements laid down in the Joint Convention and related IAEA safety standards do not guarantee a uniform approach at EU level.

To ensure the implementation of internationally endorsed principles and requirements for spent fuel and radioactive waste management, the proposed Directive makes them legally binding and enforceable. It therefore lays down specific requirements for the scope, contents and review of national programmes for spent fuel and radioactive waste management.

The basic approach is similar to that followed for the Nuclear Safety Directive, i.e. it is anchored in the competence of the national regulatory authorities and in the internationally endorsed principles and requirements of the IAEA Safety Standards and the Joint Convention, thus minimising any additional burden on the Member States' authorities.

The proposed Directive will implement the highest safety standards for spent fuel and radioactive waste management in a comprehensive manner and will thus form a model and benchmark for third countries and regions. It will ensure the implementation of radioactive waste disposal without undue delay.

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<sup>8</sup> OJ L 371, 30.12.1987, p.76.

<sup>9</sup> OJ L 346, 31.12.2003, p. 57.

<sup>10</sup> O J L 102, 11.04.2006, p. 15

<sup>11</sup> OJ L 337, 5.12.2006, p. 21.

<sup>12</sup> OJ L 338, 17.12.2008, p. 69.

<sup>13</sup> OJ L 330, 28.11.2006, p.31

## 2. CONSULTATION OF INTERESTED PARTIES AND IMPACT ASSESSMENT

When drafting the revised proposal, the Commission consulted widely through different EU-wide initiatives, in response to a request from the Council<sup>14</sup>.

The consultation involved governments, national regulators, radioactive waste management organisations, radioactive waste producers and others in the Member States, together with the various European Institutions, non-governmental organisations and other partners. A detailed contribution from the European Nuclear Safety Regulators Group (ENSREG) was taken into account. This was of key importance given the specific competence of ENSREG, which represents national nuclear regulatory or safety authorities in all Member States, nuclear and non-nuclear alike.

Special attention was given to the societal dimension through a variety of public consultations, including dedicated Eurobarometer polls<sup>15</sup> and an open public consultation<sup>16</sup>. Radioactive waste is a major concern of EU citizens in the context of continued use of nuclear energy. Furthermore, a large majority is in favour of legislation at European level.

A thorough impact assessment concluded that the lack of binding EU legislation is likely to lead to postponement of taking key decisions, with potentially adverse environmental, economic and social impacts, including undue burdens on future generations and possibly distortion of competition in the electricity market.

In contrast, binding EU legislation would result in a uniformly high level of safety of spent fuel and radioactive waste management EU-wide in the long term, without imposing undue burdens on future generations or compromising the ability of future generations to meet their own needs.

## 3. LEGAL ELEMENTS OF THE PROPOSAL

The Directive's objective as stated in its *Article 1* is the establishment of a Community framework for responsible management of spent fuel and radioactive waste, ensuring that Member States make appropriate national arrangements for a high level of safety and maintain and promote public information and participation;

Its scope (*Article 2*) covers all stages of the management of civilian spent fuel and radioactive waste from generation to disposal, but not the management of specific types of waste, such as authorised releases and waste from extractive industries which may be radioactive, as already covered by existing European legislation<sup>17,18</sup>;

Special attention was paid to ensuring the Directive is consistent with existing European legislation while making internationally accepted principles and requirements, laid down in the IAEA Safety Standards and the Joint Convention, legally binding and enforceable in the

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<sup>14</sup> June 2004 Council conclusions on Nuclear Safety and Safe Management of Spent Fuel and Radioactive Waste, 10823/04

<sup>15</sup> Special Eurobarometer 297 (2008) and Special Eurobarometer 324 (2010)

<sup>16</sup> [http://ec.europa.eu/energy/nuclear/consultations/2010\\_05\\_31\\_fuel\\_waste\\_en.htm](http://ec.europa.eu/energy/nuclear/consultations/2010_05_31_fuel_waste_en.htm)

<sup>17</sup> O J L 159, 29.6.1996, p.1

<sup>18</sup> O J L 102, 11.04.2006, p. 15

EU. Hence the set of definitions given in **Article 3** is consistent with the definitions given in both the existing European legislation and the IAEA Safety Glossary (Joint Convention)<sup>19</sup>.

General principles governing the safe and sustainable management of spent fuel and radioactive waste are laid down in **Article 4**;

Special attention has also been paid to ensure the proposed Directive is consistent with the Nuclear Safety Directive, so that all facilities for spent fuel and radioactive waste management have the same level of safety. To this end, the structures of the proposed Directive and the Nuclear Safety Directive are similar, particularly in Articles 5 to 7, 9, 12 and 16 to 18.

Obligations associated with the application of the general principles include:

- a national framework for spent fuel and radioactive waste management in the long term (**Article 5**);
- a competent regulatory authority in the field of safety of spent fuel and radioactive waste management (**Article 6**);
- license holders having the prime responsibility for safety (**Article 7**);
- education and training to obtain the expertise and skills required (**Article 9**);
- transparency in decision-making on spent fuel and radioactive waste management (**Article 12**).

Owing to the specificity of radioactive waste management, specific obligations are also introduced:

- **Article 8** sets out the approach to safety, including requirements for a safety case and a supporting safety assessment of facilities and activities relating to the management of spent fuel and radioactive waste;
- **Article 10** addresses the need to ensure that sufficient financial resources are available for spent fuel and radioactive waste management when needed, in accordance with the 'polluter-pays-principle';
- **Article 11** seeks to ensure an appropriate quality of the safety.

A conditional set of requirements in respect of the national programmes for radioactive waste and spent fuel management, needed to fulfil objectives and satisfy requirements, are included:

- **Article 13** introduces the basic requirements for national programmes;
- **Article 14** introduces the content of a national programme;
- **Article 15** requires the notification of the national programmes to the Commission.

Some final provisions are specified in:

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<sup>19</sup> <http://www-ns.iaea.org/standards/safety-glossary.htm>



- **Article 16** lays down reporting requirements consistent with the reporting mechanism for the Nuclear Safety Directive. Member States will report to the Commission on the implementation of the proposed Directive, taking advantage of the reporting cycles under the Joint Convention. On the basis of the Member States' reports, the Commission will submit a progress report to the Council and the European Parliament. Member States will invite international peer review of their national frameworks and national programmes with the aim of achieving the required high standards in the management of spent fuel and radioactive waste. The outcomes of any peer review will be reported to the Member States and the Commission.
- **Article 17** lays down requirements for transposing of the proposed directive into national legislation.
- **Articles 18 and 19** state the date of entry into force of the proposed directive and the addressees.

#### **4. BUDGETARY IMPLICATIONS**

There are no implications for the EU budget.

Proposal for a

**COUNCIL DIRECTIVE**

**on the management of spent fuel and radioactive waste**

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Articles 31 and 32 thereof,

Having regard to the proposal from the European Commission, drawn up after obtaining the opinion of a group of persons appointed by the Scientific and Technical Committee from among scientific experts in the Member States, and after having consulted the European Economic and Social Committee<sup>20</sup>,

Having regard to the opinion of the European Parliament<sup>21</sup>,

Whereas:

- (1) Article 2(b) of the Treaty provides for the establishment of uniform safety standards to protect the health of workers and of the general public.
- (2) Article 30 of the Treaty provides for the establishment of basic standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiations.
- (3) Article 37 of the Treaty requires Member States to provide the Commission with general data relating to any plan for the disposal of radioactive waste.
- (4) Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation<sup>22</sup> applies to all practices which involve a risk from ionizing radiation emanating from an artificial source or from a natural radiation source in cases where natural radionuclides are or have been processed in view of their radioactive, fissile or fertile properties. It also covers the authorised releases of materials that originate from such practices. The provisions of that Directive have been supplemented by more specific legislation.
- (5) As recognised by the Court of Justice of the European Union (hereinafter referred to as 'the Court of Justice') in its case-law, the provisions of Chapter 3 of the Treaty, on

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OJ L 159, 29.6.1996, p.1.

health and safety, form a coherent whole conferring upon the Commission powers of some considerable scope in order to protect the population and the environment against the risks of nuclear contamination<sup>23</sup>.

- (6) Council Decision 87/600/Euratom of 14 December 1987 on Community arrangements for the early exchange of information in the event of a radiological emergency<sup>24</sup> established a framework for notification and provision of information to be used by the Member States in order to protect the general public in case of a radiological emergency. Council Directive 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency<sup>25</sup> imposed obligations on the Member States to inform the general public in the event of a radiological emergency.
- (7) Council Directive 2003/122/Euratom of 22 December 2003 provides for the control of high-activity sealed radioactive sources and orphan sources<sup>26</sup>, including disused sources.
- (8) Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC<sup>27</sup> covers the management of waste from extractive industries which may be radioactive, excluding such aspects as are specific to radioactivity, which are a matter dealt with under Euratom Treaty.
- (9) Council Directive 2006/117/Euratom of 20 November 2006<sup>28</sup> lays down a Community system of supervision and control of transboundary shipments of radioactive waste and spent fuel. This Directive was supplemented by Commission Recommendation 2008/956/Euratom of 4 December 2008 on criteria for the export of radioactive waste and spent fuel to third countries<sup>29</sup>.
- (10) Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations<sup>30</sup>, defines obligations on the Member States to establish and maintain a national framework for nuclear safety. While that Directive concerns principally the nuclear safety of nuclear installation, it states that it is also important to ensure the safe management of spent fuel and radioactive waste, including at storage and disposal facilities. However, Directive 2009/71/Euratom does not cover all facilities and aspects of spent fuel and radioactive waste management.
- (11) Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 97/11/EC, by Directive 2003/35/EC and by Directive 2009/31/EC<sup>31</sup> applies to facilities for spent fuel

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<sup>23</sup> C-187/87 (1988 ECR p.5013) and C-29/99 (2002 ECR p. I-11221)

<sup>24</sup> OJ L 371, 30.12.1987, p.76.

<sup>25</sup> OJ L 357, 7.12.1989, p. 31.

<sup>26</sup> OJ L 346, 31.12.2003, p. 57.

<sup>27</sup> O J L 102, 11.04.2006, p. 15

<sup>28</sup> OJ L 337, 5.12.2006, p. 21.

<sup>29</sup> OJ L 338, 17.12.2008, p. 69.

<sup>30</sup> OJ L 172, 2.7.2009, p. 18.

<sup>31</sup> OJ L 175, 5.7.1985, p. 40.

management and facilities for radioactive waste management, in so far as they are covered by Annex I of this Directive.

- (12) Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment<sup>32</sup> states that environmental assessment shall be carried out for all plans and programmes which are prepared for certain sectors and set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC.
- (13) Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information<sup>33</sup> refers to radioactive waste in the definition of 'environmental information'.
- (14) Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment<sup>34</sup> applies to the plans and programmes contemplated by Directive 2001/42.
- (15) Commission Recommendation of 24 October 2006 on the management of the financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste<sup>35</sup> focuses on the adequacy of funding, its financial security and its transparency in order to ensure that the funds are only used for the intended purposes.
- (16) Existing Community legislation does not lay down specific rules ensuring safe and sustainable management of spent fuel and radioactive waste at all stages, from generation to disposal.
- (17) The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereafter referred to as 'the Joint Convention')<sup>36</sup>, concluded under the auspices of the IAEA, to which Euratom and almost all Member States are Contracting Parties, aims at achieving and maintaining a high level of safety world-wide in spent fuel and radioactive waste management through the enhancement of national measures and international co-operation.
- (18) In 2006 the IAEA updated its entire corpus of standards and published the Fundamental Safety Principles<sup>37</sup>, which were jointly sponsored by Euratom, OECD/NEA and other international organisations. As stated by the Joint Sponsoring Organisations, applying the Fundamental Safety Principles will facilitate the application of international safety standards and will make for greater consistency between the arrangements of different States. It is therefore desirable that all States adhere to and advocate these principles. The principles will be binding on the IAEA in relations to its operation and on States in relation to operation assisted by IAEA. States or sponsoring organisations may adopt the principles, at their own discretion, for application to their own activities.

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<sup>32</sup> OJ L 197, 21.7.2001, p. 30

<sup>33</sup> OJ L 41, 14.2.2003, p. 26

<sup>34</sup> OJ L 156, 25.6.2003, p. 17

<sup>35</sup> OJ L 330, 28.11.2006, p.31

<sup>36</sup> INFCIRC/546 of 24 December 1997.

<sup>37</sup> Fundamental Safety Principles, Safety Fundamentals No. SF-1, IAEA, Vienna, 2006

- (19) The Joint Convention represents an incentive instrument, as it does not entail any sanctions for non-compliance. Also the safety standards developed by the IAEA in cooperation with Euratom, OECD/NEA and other international organisations are neither legally binding, nor enforceable.
- (20) Following the Council's invitation to set up a High Level Group at EU level, as recorded in its Conclusions of 8 May 2007 on nuclear safety and safe management of spent fuel and radioactive waste, the European Nuclear Safety Regulators Group (ENSREG) was set up by Commission Decision 2007/530/Euratom of 17 July 2007 on establishing the European High Level Group on Nuclear Safety and Waste Management<sup>38</sup> to contribute to the achievement of the Community objectives in the field of spent fuel and radioactive waste management.
- (21) The first conclusions and recommendations of ENSREG were reflected in the Council Resolution of 16 December 2008 on Spent Fuel and Radioactive Waste Management. In July 2009 the first ENSREG's report<sup>39</sup> was submitted to the Commission, and transmitted to the European Parliament and the Council in September. It was reflected by the Council in its Conclusions of 10 November 2009<sup>40</sup>, where the Council further invites the Commission to make full use of ENSREG expertise in the case of proposals for legally binding instruments in the field of safe management of spent fuel and radioactive waste being considered.
- (22) The European Parliament called for harmonised standards for radioactive waste management<sup>41</sup> and invited the Commission to review the relevant drafts of its legislative proposal and submit a new proposal for a directive on radioactive waste management<sup>42</sup>
- (23) There is a growing recognition in the Union as well as worldwide of the need for a responsible use of nuclear energy, covering in particular nuclear safety and security. In this context the issue of spent fuel and radioactive waste management needs to be addressed in order to ensure a safe, optimised and sustainable use of nuclear energy.
- (24) While it is up to the Member States to define their energy mix, all Member States generate radioactive waste, whether or not they have nuclear reactors. Radioactive waste arises mainly from activities of the nuclear fuel cycle, such as the operation of nuclear power plants and the reprocessing of spent fuel, but also from other activities, such as applications of radioactive isotopes in medicine, research and industry.
- (25) The operation of nuclear reactors also generates spent fuel. Each Member State may define its fuel cycle policy considering spent fuel as a valuable resource that may be reprocessed, or deciding to dispose of it as waste. Whatever option is chosen, the disposal of high level waste, separated at reprocessing, or of spent fuel regarded as waste should be considered.

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<sup>38</sup> OJ L 195, 17.7.2007,p.44.

<sup>39</sup> Report of the European Nuclear Safety Regulators Group, July 2009

<sup>40</sup> Council conclusions on the report by the Europeans Nuclear Regulators Group, 10 November 2009

<sup>41</sup> European Parliament resolution on Assessing Euratom – 50 Years of European nuclear energy policy of 10 May 2007

<sup>42</sup> Report on Assessing Euratom – 50 Years of European nuclear energy policy, A6-0129/2007

- (26) The same safety objectives should apply to spent fuel management and to radioactive waste management. Recognising this, the Joint Convention and the IAEA Safety Standards impose the same obligations for disposal of spent fuel as for the disposal of radioactive waste.
- (27) Radioactive waste, including spent fuel considered as waste, requires containment and isolation from humans and the living environment over the long term. Its specific nature (content of radionuclides) requires arrangements to protect human health and the environment against dangers arising from ionizing radiation, including disposal in appropriate facilities as the end point of its management. The storage of radioactive waste, including long-term storage, is an interim solution but not an alternative to disposal.
- (28) A national radioactive waste classification scheme should support these arrangements taking fully into account the specific types and properties of radioactive waste. The precise criteria according to which waste is assigned to a particular waste class will depend on the specific situation in the State in relation to the nature of the waste and the disposal options available or under consideration.
- (29) The typical disposal concept for short lived low and intermediate level waste is near surface disposal. Following 30 years of research, it is broadly accepted at the technical level that deep geological disposal represents the safest and most sustainable option as the end point of the management of high level waste and spent fuel considered as waste. Thus moving towards implementation of disposal should be pursued.
- (30) Although each Member State is responsible for its own policy on spent fuel and radioactive waste management, that policy should respect the relevant fundamental safety principles set by the IAEA<sup>43</sup>. It is an ethical obligation of each Member State to avoid any undue burden on future generations in respect of the existing spent fuel and radioactive waste, as well as those expected from decommissioning of existing nuclear installations.
- (31) For the responsible management of spent fuel and radioactive waste, each Member State should establish a national framework which assures political commitments and stepwise decision making implemented through adequate legislation, regulation and organisation with a clear allocation of responsibilities.
- (32) The ultimate responsibility of Member States for the safety of spent fuel and radioactive waste management is a fundamental principle reaffirmed by the Joint Convention. This principle of national responsibility, as well as the principle of prime responsibility of the licence holder for the safety of spent fuel and radioactive waste management under the supervision of its national competent regulatory authority, should be enhanced and the role and independence of the competent regulatory authority should be reinforced by this Directive.
- (33) A national programme should be established to ensure the transposition of the political decisions into clear provisions for the timely implementation of all steps of spent fuel and radioactive waste management from generation to disposal. This should include

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<sup>43</sup> Fundamental Safety Principles, Safety Fundamentals No. SF-1, IAEA, Vienna, 2006

all activities that relate to handling, pre-treatment, treatment, conditioning, storage, and disposal of radioactive waste. The national programme may be a reference document or a set of documents.

- (34) The different steps in spent fuel and radioactive waste management are closely interrelated. Decisions taken in one individual step may affect a subsequent step. Therefore such interdependencies should be taken into account when developing national programmes.
- (35) Transparency is important in the management of spent fuel and radioactive waste. It should be provided by requiring effective public information and opportunities for all concerned stakeholders to participate in the decision-making processes.
- (36) Cooperation between Member States and at an international level could facilitate and accelerate decision-making through access to expertise and technology.
- (37) Some Member States consider that the sharing of facilities for spent fuel and radioactive waste management, including disposal facilities, is a potentially beneficial option when based on an agreement between Member States concerned.
- (38) When implementing this Directive, Member States should adopt an approach towards a particular facility or activity that is proportional to the potential hazard presented by that facility or activity (graded approach), and make appropriate justifications in the safety case.
- (39) The safety case and the graded approach should provide a basis for decisions related to the development, operation and closure of a disposal facility and should allow the identification of areas of uncertainty on which attention needs to be focused to further improve the understanding of those aspects influencing the safety of the disposal system, including natural (geological) and engineered barriers, and its expected development over the time. The safety case should include the findings of the safety assessment and information on the robustness and reliability of the safety assessment and the assumptions made therein. It should therefore provide the collection of arguments and evidence in support of the safety of a facility or activity related to the management of spent fuel and radioactive waste.
- (40) While recognizing that all hazards associated with spent fuel and radioactive waste should be taken into account in the national framework, this Directive does not cover non radiological hazards, which fall under the Treaty on the Functioning of the European Union.
- (41) Maintaining and further developing competences and skills in the management of spent fuel and radioactive waste, as an essential element to ensure high levels of safety, should be based on a combination of learning through operational experience, scientific research and technological development, and technical cooperation between all actors.
- (42) Peer review of national programmes could serve as an excellent means of building confidence and trust in the management of radioactive waste and spent fuel in the European Union, with the aim to develop and exchange experience and ensure high standards.

HAS ADOPTED THIS DIRECTIVE:

## Article 1

### **Subject-matter and objectives**

- (1) This Directive establishes a Community framework for ensuring responsible management of spent fuel and radioactive waste.
- (2) It ensures that Member States provide for appropriate national arrangements for a high level of safety in spent fuel and radioactive waste management to protect workers and the general public against the dangers arising from ionizing radiation.
- (3) It maintains and promotes public information and participation with regard to spent fuel and radioactive waste management.
- (4) This Directive supplements the basic standards referred to in Article 30 of the Treaty as regards the safety of spent fuel and radioactive waste and is without prejudice to Directive 96/29/Euratom.

## Article 2

### **Scope**

- (1) This Directive shall apply to:
  - (a) all stages of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors or is managed within civilian activities;
  - (b) all stages of radioactive waste management, from generation up to disposal, when the radioactive waste results from civilian activities or is managed within civilian activities;
- (2) Waste from extractive industries which may be radioactive and falls within the scope of Directive 2006/21/EC shall not be subject to this Directive.
- (3) This Directive shall not apply to authorised releases.

## Article 3

### **Definitions**

For the purpose of this Directive the following definitions shall apply:

- (1) 'closure' means the completion of all operations at some time after the emplacement of spent fuel or radioactive waste in a disposal facility, including the final engineering or other work required to bring the facility to a condition that will be safe in the long term;
- (2) 'competent regulatory authority' means an authority or a system of authorities designated in a Member State in the field of regulation of the safety of spent fuel or radioactive waste management as referred to in Article 6;



- (3) 'disposal' means the emplacement of spent fuel or radioactive waste in an authorised facility with no intention of retrieval;
- (4) 'licence' means any legal document granted under the jurisdiction of a Member state to carry out any activity related to the management of spent fuel or of radioactive waste, or to confer responsibility for siting, design, construction, commissioning, operation, decommissioning or closure of a spent fuel management facility or of a radioactive waste management facility;
- (5) 'licence holder' means a legal or natural person having overall responsibility for any activity or facility related to the management of spent fuel or radioactive waste as specified in a licence;
- (6) 'radioactive waste' means radioactive material in gaseous, liquid or solid form for which no further use is foreseen by the Member State or by a natural or legal person whose decision is accepted by the Member State, and which is controlled as radioactive waste by a competent regulatory authority under the legislative and regulatory framework of the Member State;
- (7) 'radioactive waste management' means all activities, that relate to handling, pretreatment, treatment, conditioning, storage, or disposal of radioactive waste, excluding off-site transportation;
- (8) 'radioactive waste management facility' means any facility or installation the primary purpose of which is radioactive waste management;
- (9) 'reprocessing' means a process or operation, the purpose of which is to extract fissile and fertile materials from spent fuel for further use;
- (10) 'spent fuel' means nuclear fuel that has been irradiated in and permanently removed from a reactor core; spent fuel may either be considered as a usable resource that can be reprocessed or be destined for disposal if regarded as radioactive waste;
- (11) 'spent fuel management' means all activities that relates to the handling, storage, reprocessing, or disposal of spent fuel, excluding off-site transportation;
- (12) 'spent fuel management facility' means any facility or installation the primary purpose of which is spent fuel management;
- (13) 'storage' means the holding of spent fuel or of radioactive waste in an authorised facility with the intention of retrieval.

## Article 4

### **General principles**

- (1) Member States shall establish and maintain national policies on spent fuel and radioactive waste management. They have ultimate responsibility for management of their spent fuel and radioactive waste.
- (2) Member States shall ensure that:
  - (a) the generation of radioactive waste is kept to the minimum practicable, in terms of both activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including recycle and reuse of conventional materials;
  - (b) the interdependencies between all steps in spent fuel and radioactive waste generation and management are taken into account;
  - (c) no undue burdens are imposed on future generations;
  - (d) spent fuel and radioactive waste are safely managed, including in the long term.
- (3) Radioactive waste shall be disposed of in the Member State in which it was generated, unless agreements are concluded between Member States to use disposal facilities in one of them.

## Article 5

### **National framework**

- (1) Member States shall establish and maintain a national legislative, regulatory and organisational framework (referred to as the 'national framework') for spent fuel and radioactive waste management that allocates responsibilities and provides for coordination between relevant state bodies in the long term. The national framework shall include:
  - (a) a national programme for implementation of the policy on spent fuel and radioactive waste management;
  - (b) national requirements for the safety of spent fuel and radioactive waste management;
  - (c) a system of licensing of spent fuel and radioactive waste management activities and facilities, including prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;
  - (d) a system of appropriate institutional control, regulatory inspections, documentation and reporting;
  - (e) enforcement actions, including suspension of activities and modification or revocation of a licence;

- (f) the bodies involved in the different steps of spent fuel and of radioactive waste management.
- (2) Member States shall ensure that the national framework is maintained and improved as necessary, taking into account operating experience, insights gained from safety cases as referred to in Article 8, the development of technology and the results of research.

#### Article 6

##### **Competent regulatory authority**

- (1) Member States shall establish and maintain a regulatory authority competent in the field of spent fuel and radioactive waste management.
- (2) Member States shall ensure that the competent regulatory authority is functionally separate from any other body or organisation concerned with the promotion or exploitation of nuclear energy or radioactive material, including electricity production and radioisotope applications, or with the management of spent fuel and radioactive waste, in order to ensure effective independence from undue influence in its regulatory function.
- (3) Member States shall ensure that the competent regulatory authority is given the legal powers and human and financial resources necessary to fulfil its obligations in connection with the national framework described in Article 5(1) with due priority to safety.

#### Article 7

##### **Licence holders**

- (1) Member States shall ensure that the prime responsibility for the safety of spent fuel and radioactive waste management rests with the licence holder. This responsibility can not be delegated.
- (2) Member States shall ensure that the national framework requires licence holders, under the supervision of the competent regulatory authority, to regularly assess and verify, and continuously improve, as far as reasonably achievable, the safety of their activities and facilities in a systematic and verifiable manner.
- (3) The assessments referred to in paragraph 2 shall include verification that measures are in place to prevent accidents and mitigate the consequences of accidents, including verification of the physical barriers and the licence holder's administrative procedures for protection that would have to fail before workers and the general public would be significantly affected by ionizing radiation.
- (4) Member States shall ensure that the national framework requires licence holders to establish and implement management systems which give due priority to safety and are regularly verified by the competent regulatory authority.
- (5) Member States shall ensure that the national framework requires licence holders to provide for and maintain adequate financial and human resources to fulfil their

obligations with respect to the safety of spent fuel and radioactive waste management, laid down in paragraphs 1 to 4.

## Article 8

### **Safety case**

- (1) A safety case and a supporting safety assessment shall be prepared as part of the license application for a facility or activity. They shall be updated, as necessary, over the evolution of the facility or activity. The extent and detail of the safety case and the safety assessment shall be commensurate with the complexity of the operations and the magnitude of the hazards associated with the facility or activity.
- (2) The safety case and supporting safety assessment shall cover the siting, design, construction, operation, and decommissioning of a facility or closure of a disposal facility; the safety case shall specify the standards applied for this assessment. The long-term post-closure safety shall be addressed, in particular how it is ensured by passive means to the fullest extent possible.
- (3) The safety case for a facility shall describe all safety-relevant aspects of the site, the design of the facility, and the managerial control measures and regulatory controls. The safety case and supporting safety assessment shall demonstrate the level of protection provided and shall provide assurance to the competent regulatory authority and other interested parties that safety requirements will be met.
- (4) The safety case and supporting safety assessment shall be submitted to the competent regulatory authority for approval.

## Article 9

### **Expertise and skills**

Member States shall ensure that the national framework includes arrangements for education and training covering the needs of all parties with responsibilities for spent fuel and radioactive waste management in order to maintain and to further develop necessary expertise and skills.

## Article 10

### **Financial resources**

Member States shall ensure that the national framework guarantees that adequate financial resources are available when needed for the management of spent fuel and radioactive waste, taking due account of the responsibility of radioactive waste producers.

## Article 11

### **Quality assurance**

Member States shall ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.

## Article 12

### **Transparency**

- (1) Member States shall ensure that information on the management of spent fuel and radioactive waste is made available to workers and the general public. This obligation includes ensuring that the competent regulatory authority informs the public in the fields of its competence. Information shall be made available to the public in accordance with national legislation and international obligations, provided that this does not jeopardise other interests recognised in national legislation or international obligations such as, inter alia, security.
- (2) Member States shall ensure that the public is given opportunities to participate effectively in the process of decision making on spent fuel and radioactive waste management.

## Article 13

### **National programmes**

- (1) As part of the national framework, Member States shall establish, implement and keep updated programmes for the management of spent fuel and radioactive waste (hereafter referred to as 'national programmes'), covering all types of spent fuel and radioactive waste under their jurisdiction and all stages of spent fuel and radioactive waste management from generation to disposal.
- (2) National programmes shall be in line with the provisions of Articles 4 to 12.
- (3) Member States shall regularly review and update their national programmes, taking into account technical and scientific progress as appropriate.

## Article 14

### **Contents of national programmes**

National programmes shall include:

- (1) an inventory of all spent fuel and radioactive waste and provisions of future quantities, including those from decommissioning. The inventory shall clearly indicate the location and amount of the material and, through appropriate classification, the level of hazard;
- (2) concepts, plans and technical solutions from generation to disposal;
- (3) concepts and plans for the post-closure period of a disposal facility, including time over which institutional controls are retained and the means to be employed to preserve knowledge of the facility in the longer term;
- (4) description of research, development and demonstration activities that are needed in order to implement solutions for the management of spent fuel and radioactive waste;
- (5) major milestones, clear timeframes and responsibilities for implementation;

- (6) key performance indicators to monitor progress towards implementation;
- (7) assessment of programme costs and the underlying basis and hypotheses for this assessment, which must include a profile over time;
- (8) description of the financing scheme(s) in force to ensure all programme costs can be met according to the foreseen schedule.

#### Article 15

##### **Notification**

- (1) Member States shall notify the Commission of their national programmes and of subsequent significant changes.
- (2) Within three months of the date of notification, the Commission may request further clarification and/or revision in line with the provisions of the present Directive.
- (3) Within three months from receiving the Commission's reaction Member States shall provide the requested clarification and/or inform the Commission how the revision will be implemented.
- (4) The Commission will take into account the Member States' clarifications and progress on the national waste management programs, when deciding on the provision of Euratom financial or technical assistance for spent fuel and radioactive waste management facilities or activities, or when formulating its views on investment projects in accordance with Article 43 of the Euratom Treaty.

#### Article 16

##### **Reporting**

- (1) Member States shall submit a report to the Commission on the implementation of this Directive for the first time by ....., and every three years thereafter, taking advantage of the review and reporting cycles under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.
- (2) On the basis of the Member States' reports, the Commission shall submit a report to the Council and the European Parliament on progress made with the implementation of this Directive. On the same basis, the Commission shall also submit an inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects.
- (3) Member States shall periodically, and at least every 10 years, arrange for self-assessments of their national framework, competent regulatory authority, national programme and its implementation, and invite international peer review of their national framework, authority and/or programme with the aim of ensuring that high standards are achieved in the management of spent fuel and radioactive waste. The outcomes of any peer review shall be reported to the Commission and the Member States.

Article 17

**Transposition**

- (1) Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by ..... They shall forthwith inform the Commission thereof. When Member States adopt these measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.
- (2) Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive and of any subsequent amendments to those provisions.
- (3) Member States shall notify the Commission their first National Programme covering all the items provided for in Article 14 as soon as possible but not later than four years after the entry into force of this Directive.

Article 18

**Entry into force**

This Directive shall enter into force on the twentieth day following its publication in the *Official Journal of the European Union*.

Article 19

**Addressees**

This Directive is addressed to the Member States.

Done at Brussels,

*For the Council  
The President*