ENSREG Working Group2

Guidelines for Member States reporting on Article 14.1 of Council Directive 2011/70/Euratom

January 2018

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I. Introduction to the Guidelines and general suggestions regarding the Directive National Report

I.1 Introduction to the Guidelines

These Guidelines were developed by the European Nuclear Safety Regulators Group (ENSREG) to assist Member States to fulfil the requirement of Article 14.1 of *Council Directive 2011/70/Euratom* (hereinafter called the *Directive*) on submitting a three-yearly report to the European Commission (hereinafter called the *Commission*) on the implementation of the Directive (Directive National Report, hereinafter called *National Report*). Their purpose is to provide guidance to Member States regarding information and material that it may be useful to include in the reports required under Article 14.1, and to establish a unified structure for reporting.

The Guidelines are largely based on the first Guidelines that ENSREG issued in May 2014[1]. They take into account the experience and lessons learnt from Members States during the preparation of the first National Report (submitted August 2015), supported by output from an ENSREG workshop discussing these in October 2016[2]. They also take into account the report from the European Commission to the Council and the European Parliament on progress of implementation of Council Directive 2011/70/EURATOM and an inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects[3]. The Guidelines have only been revised where there is a strong reason to do so, in order to strike the right balance between ensuring reporting continuity and improving reporting efficiency and quality.

The Guidelines are intended to be read in conjunction with the text of the Directive. They have no legal status, neither do they set out to conclusively interpret, modify or extend the obligations of the Directive, i.e. the text of the Directive prevails. The Guidelines are based on a consensual understanding by ENSREG of the obligations of the Directive regarding information and material that Member States may usefully include in their National Reports required under Article 14.1.

The present Guidelines take into consideration the Guidelines for the establishment and notification of National Programmes (issued by ENEF (European Nuclear Energy Forum) Working Group on National Programmes - NAPRO in January 2013), for reasons of the complementarity and coherence of information that Member States should provide with their National Programme and their National Reports.

The use of the present Guidelines is voluntary and Member States have the right to submit their National Report with the form, length and structure they believe necessary to describe how they comply with the obligations under the Directive.

[1] http://www.ensreg.eu/document/final-guidelines-ms-reports-waste-directive
[2] http://www.ensreg.eu/sites/default/files/attachments/ensreg_wg2_ws_2016_-_summary_report.pdf
[3] Brussels, 15.5.2017, COM(2017) 236 final; see also SWD(2017) 159 final and SWD(2017) 161 final.

The Guidelines do not address other reporting obligations in the Directive such as reporting on the transposition of the Directive (Article 15.3), or notifying national programmes to the Commission (Articles 13 and 15.4). The Guidelines suggest the opportunity for Member States to report in the National Report the outcomes of any peer reviews to the Commission (Article 14.3 (b)), but Member States may also choose to report these outcomes separately to the Commission.

I.2 General suggestions regarding the National Report

I.2.1 Contents

Article 14 – Reporting

1. Member States shall submit a report to the Commission on the implementation of this Directive for the first time by 23 August 2015, and every 3 years thereafter, taking advantage of the review and reporting under the Joint Convention.
2. On the basis of the Member States' reports, the Commission shall submit to the European Parliament and the Council the following:
   (a) a report on progress made with the implementation of this Directive; and
   (b) 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, competent regulatory authority and/or national programme with the aim of ensuring that high safety standards are achieved in the safe management of spent fuel and radioactive waste. The outcomes of any peer review shall be reported to the Commission and the other Member States, and may be made available to the public where there is no conflict with security and proprietary information.

Article 14.1 of the Directive requires Member States to report, on a three yearly cycle, on the implementation of the Directive. In the opinion of ENSREG, Member States should demonstrate and illustrate in their reporting how they have fulfilled their obligations under the Directive for each of the requirements. They should report actual progress and that planned to be made in the future related to the requirements of the Directive, i.e. they should report progress on the responsible and safe management of spent fuel and radioactive waste to avoid imposing undue burdens on future generations. ENSREG considers the National Report to be a tool for assessing and communicating changes and progress since the previous National Report (e.g. with respect to the implementation of the national programme), while still reporting on the entirety of obligations of the Directive (i.e. stand-alone character of the National Report).

Article 14.1 directs Member States to take advantage of reporting under the Joint Convention on the Safety of Spent Nuclear Fuel Management and on the Safety of Radioactive Waste Management (JC) (i.e. in regards to optimising the use of resources and to providing coherent information) to assist them in preparing their National Report. The Directive and JC have the same overall objective of the safe management of spent fuel and radioactive waste. Although they have different addressees and some differences in scope, they basically address the same principles and objectives, as well as the same system, i.e. the national system for radioactive waste and spent fuel management (framework, bodies, facilities, activities, …). ENSREG considers it beneficial for reporting quality and efficiency to emphasize the commonalities between the JC and the Directive reporting obligations. Therefore, ENSREG recommends a reporting structure that aligns with the Directive objectives and structure, but that also strives to incorporate a large number of common or

similar sections of the JC reporting structure according to the Guidelines regarding form and structure of these reports[4].

To facilitate and optimise Member States reporting efforts, a comparison of the reporting under the Directive and under the Joint Convention is provided in Appendix 1. This comparison may help Member States to identify the information and material to be reported under the National Report.

The National Report should give a comprehensive but concise high-level overview of how a Member State complies with the Directive, with an emphasis on major changes and progress made since the previous report. ENSREG is of the opinion that Member States National Reports should provide an account for both formal compliance (i.e. the existence of legal and regulatory elements laid down in a Member States national framework) and key examples of factual compliance (the actual application of these legal and regulatory elements in illustrative cases and situations).

ENSREG recommends that Member States consider providing key examples to illustrate or demonstrate the implementation of Directive obligations and to illustrate progress made (e.g. key steps in licensing process of disposal facilities, completed self assessment and/or peer review). ENSREG understands that the high-level overview nature of a National Report does not allow Member States to provide comprehensive lists of examples.

In general the level of detail should be commensurate with the importance of the step in the management of spent fuel and radioactive waste generated in the Member State, keeping in mind that the National Report should be a high-level document of approximately 50 pages. For Member States with small nuclear programmes the level of detail and the length of the report should be adapted to the challenge the Member State is facing in radioactive waste management. Member States may add more detailed information in the form of annexes. They may refer to more detailed underlying information of key importance for compliance demonstration or illustration, in publically available documents or other sources (keeping inmind that web link references as such are considered as part of the National Report); this should be done without affecting the stand-alone character of the National Report.

The proposed unified structure for National Reports (see below – part II) takes into account the fact that there are related requirements of different hierarchical levels in the Directive, in particular at the levels of national policy, national framework and national programme. Members States can provide the related information in a consistent manner, avoiding duplication. An example of this are the financial obligations, which are dealt with in the Directive under general principles (Article 4), under the national framework (Article 5), as a specific provision (Article 9) and as an element of the National Program (Article 12).

Member States should be aware that where spent fuel and radioactive waste facilities are addressed by both the Directive and the Nuclear Safety Directive (Council Directive 2009/71/Euratom), Member States should take care of consistent reporting on these facilities.

[4] Guidelines regarding the Form and Structure of National Reports- IAEA INFCIRC/604/Rev.3 (2014) (https://www.iaea.org/publications/documents/infcircs/joint-convention-safety-spent-fuel-management-and-safety-radioactive-waste-management-2)

Council Directive 2006/117/Euratom on the supervision and control of shipments of radioactive waste and spent fuel (the Shipments Directive) also entails reporting obligations for the Member States and, in a similar way, consistent information should be provided for the Directive and the Shipments Directive.

I.2.2 Structure and format

It is considered good practice to commence each section within the National Report with the text of the article or articles of the Directive that are dealt with in that section, to enable the reader to understand the purpose of the section with regard to the Directive obligations and requirements.

All information contained in the National Report should be explicitly connected to a specific Directive article where possible or clear references should be used in case of merged information. The information should be structured in accordance with the sub-paragraphs within each article, where appropriate. Detailed suggestions are contained in Part II of these Guidelines.

The National Report should have a table of contents and, if necessary, a list of acronyms, definitions or abbreviations should be included.

ENSREG recommends that Member States make their National Reports public, where there is no conflict with security and proprietary information.

II. Proposed structure and related content of the National Report

The proposed structure and related content of the National Report contains 13 sections (section A till section M). For each section and where applicable, the relationship with the articles and sub-articles of the Directive is indicated.

Where relevant, guidance is given on how information used for reporting under the Joint Convention may be utilised.

A. Introduction

Section A in the National Report should start with an overview of the management of spent fuel and radioactive waste within the Member State, setting the scene for the reader to understand what will be described in more detail in the report.

Section A should therefore include:

- the current and potential sources of spent fuel and radioactive waste (e.g. nuclear energy production, medical and industrial applications), as well as historical or legacy ones;
- the regulatory bodies and implementing organisations involved in the responsible and safe management of spent fuel and radioactive waste;
- the major elements of the national policy and the national programme on spent fuel and radioactive waste management (such as disposal routes, reprocessing vs. direct disposal, expected time of storage as a function of disposal implementation steps);
- information on the process and bodies involved in the preparation of the National Report.

For this section, Member States might choose to use fragments of their JC report section A. In particular, tables or diagrams used in the JC report might help to make this chapter reasonably short while delivering all the relevant information.

B. Recent developments

Section B in the National Report should serve as a major information source on the progress made and the changes that occurred in the management of spent fuel and radioactive waste by summarising the developments since the previous National Report.

This section should focus on the achievements in implementing the national policies through the national programme and on any important changes in the national policies, national framework and national programme.

The section should also address important issues or challenges, if any, relevant to the Directive implementation, including those identified in self-assessments and/or peer reviews.

For this section, Member States might choose to use fragments of their JC report sections A and K or summary section.

C. Scope and inventory (Article 2, Article 12.1 (c), Article 14.2 (b))

Article 2 – Scope

1. This Directive shall apply to all stages of:
   (a) spent fuel management when the spent fuel results from civilian activities;
   (b) radioactive waste management, from generation to disposal, when the radioactive waste results from civilian activities.
2. This Directive shall not apply to:
   (a) waste from extractive industries which may be radioactive and which falls within the scope of Directive 2006/21/EC;
   (b) authorised releases.
3. Article 4(4) of this Directive shall not apply to:
   (a) repatriation of disused sealed sources to a supplier or manufacturer;
   (b) shipment of spent fuel of research reactors to a country where research reactor fuels are supplied or manufactured, taking into account applicable international agreements;
   (c) the waste and spent fuel of the existing Krško nuclear power plant, when it concerns shipments between Slovenia and Croatia.
4. This Directive shall not affect the right of a Member State or an undertaking in that Member State to return radioactive waste after processing to its country of origin where:
   (a) the radioactive waste is to be shipped to that Member State or undertaking for processing; or
   (b) other material is to be shipped to that Member State or undertaking with the purpose of recovering the radioactive waste.

   This Directive shall not affect the right of a Member State or an undertaking in that Member State to which spent fuel is to be shipped for treatment or reprocessing to return to its country of origin radioactive waste recovered from the treatment or reprocessing operation, or an agreed equivalent.

Article 12 – Contents of national programmes

1. The national programmes shall set out how the Member States intend to implement their national policies referred to in Article 4 for the responsible and safe management of spent fuel and radioactive waste to secure the aims of this Directive, and shall include all of the following:
   (…)
   (c) an inventory of all spent fuel and radioactive waste and estimates for future quantities, including those from decommissioning, clearly indicating the location and amount of the radioactive waste and spent fuel in accordance with appropriate classification of the radioactive waste;

Article 14 – Reporting

(…)
2. On the basis of the Member States' reports, the Commission shall submit to the European Parliament and the Council the following:
   (…)
   (b) an inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects.

In this section, Member States should describe their national definition of "radioactive waste" and classification system and indicate what waste is included in it. The boundary with waste covered under Directive 2006/21/EC[5] (extractive industries) for the management of NORM should be clearly defined in order to determine the scope of radioactive waste included in the inventory reported for Directive 2011/70/Euratom.

[5] Directive 2006/21/EC on the management of waste from extractive industries and amending Directive 2004/35/EC (http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006L0021&from=EN)

Member States should provide a list of the types of activities generating radioactive waste*f* and/or spent fuel. This may include reprocessing or treatment abroad from which radioactive waste will be returned to the Member States. This would help the readers to gain a general overview of the national situation before going into the details of the report.

Article 14 of the Directive requires regular reporting of the inventories and the future prospects. The definition and application of a national waste classification system is a national responsibility (Recital 22). The national classification system takes fully into account the specific types and properties of the spent fuel and radioactive waste to be managed and the operational or planned facilities for its management.

Member States can deliver the inventory and the future prospects according to their national classification system. In order to make the information comparable on the Community's territory, Member States are recommended to provide a table to translate their national inventory into the IAEA classification system (IAEA Safety Guide "Classification of Radioactive Waste" GSG-1, 2009) or directly report their inventory according to IAEA classification system.

Member States are required to provide in their National Programme an inventory of all spent fuel and radioactive waste and estimates for future quantities, including those from decommissioning, clearly indicating the location and amount of spent fuel and radioactive waste (see Article 12.1(c)).

Guidance on the level of detail concerning the inventories is presented in Appendix 2.

ENSREG recommends that Member States ensure that the combination of National Programme and National Report provides the required information on inventory and estimates of future quantities and that, when applicable, updated information is presented in the National Report.

Article 14 requires Member States to report not only on the inventory, but also on estimates for future quantities, including those from decommissioning. It is understood that estimates for future quantities are connected with uncertainties depending on the assumptions (to be) made. Taking into account that the National Report gives an overview, Member States could provide the general assumptions which the expected amounts are based on, as giving the basis of the calculation may make it easier to understand when estimates change in the future. Member States may also choose to refer to more detailed information of their national inventory that might be publically available[6].

ENSREG is of the opinion that the level of detail of inventory reporting in the National Report (including estimates for future quantities) should be in line with the high-level character of the National Report.

[6] ENSREG is aware of the ongoing project on the harmonisation of inventory reporting by IAEA, OECD/NEA and EC that aims at achieving a more harmonized approach to collection and presentations of data on present and future inventories of spent fuel and radioactive waste.

D. General principles and policies (Article 4)

Article 4 – General principles

1. Member States shall establish and maintain national policies on spent fuel and radioactive waste management. Without prejudice to Article 2(3), each Member State shall have ultimate responsibility for management of the spent fuel and radioactive waste generated in it.
2. Where radioactive waste or spent fuel is shipped for processing or reprocessing to a Member State or a third country, the ultimate responsibility for the safe and responsible disposal of those materials, including any waste as a by-product, shall remain with the Member State or third country from which the radioactive material was shipped.
3. National policies shall be based on all of the following principles:
   (a) the generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials;
   (b) the interdependencies between all steps in spent fuel and radioactive waste generation and management shall be taken into account;
   (c) spent fuel and radioactive waste shall be safely managed, including in the long term with passive safety features;
   (d) implementation of measures shall follow a graded approach;
   (e) the costs for the management of spent fuel and radioactive waste shall be borne by those who generated those materials;
   (f) an evidence-based and documented decision-making process shall be applied with regard to all stages of the management of spent fuel and radioactive waste.
4. Radioactive waste shall be disposed of in the Member State in which it was generated, unless at the time of shipment an agreement, taking into account the criteria established by the Commission in accordance with Article 16(2) of Directive 2006/117/Euratom, has entered into force between the Member State concerned and another Member State or a third country to use a disposal facility in one of them.
   Prior to a shipment to a third country, the exporting Member State shall inform the Commission of the content of any such agreement and take reasonable measures to be assured that:
   (a) the country of destination has concluded an agreement with the Community covering spent fuel and radioactive waste management or is a party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ('the Joint Convention');
   (b) the country of destination has radioactive waste management and disposal programmes with objectives representing a high level of safety equivalent to those established by this Directive; and
   (c) the disposal facility in the country of destination is authorised for the radioactive waste to be shipped, is operating prior to the shipment, and is managed in accordance with the requirements set down in the radioactive waste management and disposal programme of that country of destination.

This section should give an overview of the established national policies on spent fuel and radioactive waste management, also indicating whether they have been updated or changed. This includes, where relevant, a reference to the possible exports of spent fuel and radioactive waste.

This section should contain a summary or statement on the national policy/policies that:

- the ultimate responsibility rests with the Member States, including the provisions of Articles 4.2 and 4.4;
- the national policies are based on the principles as specified in Article 4.3;

- long-term management and end points of all radioactive waste streams (including those covered by Article 4.2) are addressed. If for some of the streams (e.g. disposal of institutional waste) no endpoint is determined yet, then the process to define the endpoint should be described (e.g. development of shared disposal facilities).

Member States may refer to section A (Introduction) and B (Recent developments) of the report.

Member States are encouraged to consider providing information in the subsequent sections of the National Report to indicate or illustrate how the principles as specified in Article 4.3 are actually implemented, e.g. the principle of interdependencies[7] (Article 4.3 (b)) in section E, and the principle of cost bearing by the waste generators (Article 4.3 (e)) in section G.

With respect to Member States policies or programmes for disposal in other Member States or in a third country (e.g. development of shared disposal facilities), Member States should refer to any agreement mentioned under Article 4.4 and Article 12.1 (k).

As shown in Appendix 1, the general principles contained in article 4 of the Directive are dealt with in the JC report only partially and split in different articles; therefore the direct use of certain parts of the JC report might be difficult in this section.

[7] Interdependencies: recital 30 states that interdependencies between different steps in SF and RW management should be taken into account when developing national programmes. In the opinion of ENSREG this requires: (1) an appropriate coordination between bodies and actors involved (Article 5.1), and (2) tools and instruments to adequately manage the material and information flows (from generation to disposal and from disposal to generation) mentioned in Figure 1 and in the text referring to this Figure.

E. National framework (Article 5)

Article 5 – National framework

1. Member States shall establish and maintain a national legislative, regulatory and organisational framework ('national framework') for spent fuel and radioactive waste management that allocates responsibility and provides for coordination between relevant competent bodies. The national framework shall provide for all of the following:
    (a) a national programme for the implementation of spent fuel and radioactive waste management policy;
    (b) national arrangements for the safety of spent fuel and radioactive waste management. The determination of how those arrangements are to be adopted and through which instrument they are to be applied rests within the competence of the Member States;
    (c) a system of licensing of spent fuel and radioactive waste management activities, facilities or both, including the prohibition of spent fuel or radioactive waste management activities, of the operation of a spent fuel or radioactive waste management facility without a licence or both and, if appropriate, prescribing conditions for further management of the activity, facility or both;
    (d) a system of appropriate control, a management system, regulatory inspections, documentation and reporting obligations for radioactive waste and spent fuel management activities, facilities or both, including appropriate measures for the post-closure periods of disposal facilities;
    (e) enforcement actions, including the suspension of activities and the modification, expiration or revocation of a licence together with requirements, if appropriate, for alternative solutions that lead to improved safety;
    (f) the allocation of responsibility to the bodies involved in the different steps of spent fuel and radioactive waste management; in particular, the national framework shall give primary responsibility for the spent fuel and radioactive waste to their generators or, under specific circumstances, to a licence holder to whom this responsibility has been entrusted by competent bodies;
    (g) national requirements for public information and participation;
    (h) the financing scheme(s) for spent fuel and radioactive waste management in accordance with Article 9.
2. Member States shall ensure that the national framework is improved where appropriate, taking into account operating experience, insights gained from the decision-making process referred to in Article 4(3)(f), and the development of relevant technology and research.

General introduction to section E:

The national legislative, regulatory and organisational framework, as defined in Article 5 of the Directive, needs to be described in a succinct and self-explanatory way. Section E of the National Report should therefore give an overview of (1) the main laws and regulations dealing with the management of spent fuel and radioactive waste, (2) the bodies in charge and their responsibilities, and (3) the coordination between these bodies (regulatory functions/licensing authorit(y)(ies)/license holders, etc..). Important new elements of the national framework, if applicable, should be highlighted in this section.

Member States are encouraged to use diagrams to minimise detailed narrative.

Member States may provide more detailed information on the relevant national legislation and on the ratification of relevant international conventions and legal instruments related to

the scope of the Directive (e.g. Joint Convention and Convention on Nuclear Safety) in the form of an annex comparable to the annexes of the JC National Report.

The information provided about the national framework here is relevant for other sections that appear at a later stage in the National Report, in particular when describing the implementation of Articles 6 to 12 of the Directive. So, all information contained in section E should serve as a basis for better understanding how those elements of Articles 6 to 12 are anchored in the national framework of a Member State. For instance: in Section E, Member States should provide a succinct description of the legislation implementing all the elements of Article 7, paras. from 7.1 to 7.5 (obligations for the license holders), as this information will be important at a later stage in the National Report for section G. The same can be said for the legislation implementing Article 8 (expertise and skills), which will be described with more detail in section H; and so successively. This should be kept in mind by the Member States when drafting this section E.

Member States may choose to use fragments of chapter E of their JC report in this section.

Contents:

This section should give a high-level overview of the national legislative, regulatory and organisational framework for spent fuel and radioactive wastemanagement. In the opinion of ENSREG this comprises a short description of which responsibilities the national framework allocates to:

- the Government;
- the regulatory body;
- the waste and spent fuel generators;
- other organizations with responsibilities for spent fuel and radioactive waste management within the Member State as applicable.

Furthermore it should describe or explain:

- how the interdependencies between main elements of the national framework (i.e. the coordination between government, waste generators, regulators and licence holders) are taken into account. Apart from the coordination between the different bodies (Article 5.1), Member States may wish to demonstrate diagrammatically the concept of interdependencies in relation to “material and information flows” in the national framework (see schematic diagram below). While “material flows” are in principle downstream, i.e. from the waste generation step until disposal, both upstream and downstream “information flows” have to be managed to effectively deal with the interdependencies of all spent fuel and radioactive waste management steps. Downstream “information flows” can inform e.g. the development of disposal solutions (design, location and capacity of disposal facilities) for existing waste streams and for a prospective waste inventory. Upstream “information flows” can inform e.g. the waste characterisation and processing programmes in accordance with waste disposal requirements in the form of waste acceptance criteria.

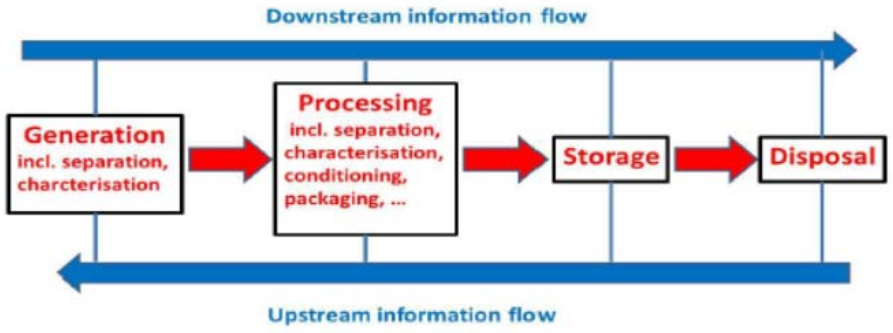


Figure 1: Schematic diagram showing Downstream (from waste generation till disposal) and Upstream (from disposal till waste generation) Information Flow.

- the role of regulators in the context of interdependencies between all management steps (see Article 5.1 (d)).
- the role of the national programme in the national framework e. g. what provisions of the legal framework relate to the national programme (e.g. responsibilities and process for adoption and review). This should not include a description of the national programme nor should it include information on the implementation, regular review and update of the national programme, as this should be addressed in section K.

When giving a short overview of the different types of instruments (e.g. legislation, regulations, regulatory guides) to implement the national arrangements for the safety of spent fuel and radioactive waste management, the processes for establishing and revising these instruments, including the responsibilities of the relevant competent bodies and the involvement of interested parties should be briefly described. This does not mean that all relevant laws and regulations should be described in detail. As mentioned earlier a comprehensive table could be provided as an annex.

Member states should provide a succinct description of the legislation that:

- assigns the responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities to the licence holder, a responsibility that cannot be delegated (Article. 7.1);
- requires that licence holders regularly assess, verify and continuously improve the safety of facilities for and activities of spent fuel and radioactive waste management (Article 7.2);
- requires licence holders to establish and implement an Integrated Management System (IMS), regularly verified by the competent regulatory authority (Article 7.4);
- requires licence holders to provide for and maintain adequate financial and human resources (Article 7.5).

A short overview on the following aspects should also be provided:

- The licensing process (e.g. responsibility for issuing, need for consent by other entities, etc.), together with the categories of licensed activities and facilities including the process for relicensing/licence renewal.

- A short high-level overview of how the national framework provides for the system of appropriate control of licensed activities or facilities, including regulatory inspections and the documentation and reporting obligations of the licensees.
- The system of enforcement for the safety of radioactive waste and spent fuel management activities and facilities. Member States could provide examples of the enforcement measures available and, if appropriate, requirements for alternative solutions that lead to improved safety. If significant measures had to be taken during the last three years Member States might provide these as examples of implementation.
- The provisions for the national requirements for public information and participation, including responsibilities and mechanisms for implementation (taking into account Recital 31). This overview should not include the description of the Member State's and regulatory authority's communication strategies as this is required for section J.
- The provisions for establishing schemes for financing of the implementation of the national policy/policies for the responsible and safe management of spent fuel and radioactive waste. This overview should only describe the legislative framework and not include a description of the identification, the sufficiency and the availability of adequate financial resources as this is required for section I.
- How the following elements are used to improve the national framework:
    - operating experience (national, international);
    - insights gained from the evidence-based and documented decision-making process (see Recital 34);
    - development of technology and results of relevant research (including international developments);
    - the outcomes of a self-assessment and/or peer review which may trigger the introduction of improvements in the national framework.

Section E concerns the improvement of the national legislative, regulatory and organisational framework, whereas section G should cover the requirement in the national framework for the license holder to continuously improve the safety of the spent fuel and radioactive waste management facilities or activities.

F. Competent regulatory authority (Article 6)

Article 6 – Competent regulatory authority

1. Each Member State shall establish and maintain a competent regulatory authority in the field of safety 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 utilisation 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 on 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 as described in Article 5(1)(b), (c), (d) and (e).

This section is expected to show how the regulatory authority is functionally separate from the bodies responsible for 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.

It is further recommended that the report provides a description of:

- how effective independence of the regulatory authority from undue influence is ensured.
- how effective independence for regulatory decision making is ensured.

Effective independence of the regulatory body should be ensured at various levels, such as technical (which may include reliance on Technical Support Organizations), financial and institutional independence.

A general statement should be made regarding:

- the legal powers and human and financial resources of the regulatory authority, including identification of the legislation in which the required legal powers are conferred;
- the processes in place to ensure the adequacy of human resources in the regulatory authority (including the technical support organisations, where relevant) with regard to the availability of qualified human resources, including if relevant, any challenges in this respect. This should consider all the duties of the regulatory authority, as required by the applicable national legal framework, which address the obligations of Article 6.3 of the Directive, including the obligations of Article 5.1;
- the arrangements in place for the regulatory authority with regard to meeting its financial needs (fees, taxes, etc.).

As this information may be the same required in section E, Article 20, of the JC report, Member States might consider using fragments of the JC report section in this section.

G. Licence holders (Article 7)

Article 7 – Licence holders

1. Member States shall ensure that the prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities rest with the licence holder. That responsibility can not be delegated.
2. Member States shall ensure that the national framework in place require licence holders, under the regulatory control of the competent regulatory authority, to regularly assess, verify and continuously improve, as far as is reasonably achievable, the safety of the radioactive waste and spent fuel management facility or activity in a systematic and verifiable manner. This shall be achieved through an appropriate safety assessment, other arguments and evidence.
3. As part of the licensing of a facility or activity the safety demonstration shall cover the development and operation of an activity and the development, operation and decommissioning of a facility or closure of a disposal facility as well as the post- closure phase of a disposal facility. The extent of the safety demonstration shall be commensurate with the complexity of the operation and the magnitude of the hazards associated with the radioactive waste and spent fuel, and the facility or activity. The licensing process shall contribute to safety in the facility or activity during normal operating conditions, anticipated operational occurrences and design basis accidents. It shall provide the required assurance of safety in the facility or activity. Measures shall be in place to prevent accidents and mitigate the consequences of accidents, including verification of physical barriers and the licence holder's administrative protection procedures that would have to fail before workers and the general public would be significantly affected by ionising radiation. That approach shall identify and reduce uncertainties.
4. Member States shall ensure that the national framework require licence holders to establish and implement integrated management systems, including quality assurance, which give due priority for overall management of spent fuel and radioactive waste to safety and are regularly verified by the competent regulatory authority.
5. Member States shall ensure that the national framework require 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 as laid down in paragraphs 1 to 4.

Main focus of reporting in section G under Article 7 should be to demonstrate and/or illustrate with key examples or other adequate measures the following aspects for facilities and/or activities in operation or planned:

- safety assessments and safety demonstrations conducted or in preparation to regularly assess, verify and improve safety;
- measures taken to improve safety and/or to prevent accidents and mitigate their consequences;
- the development of integrated management systems and their implementation;
- and the management of interdependencies (see also figure 1).

If using key examples, Member States could address progress made or progress to be made with the implementation of the national policies for the management of all the radioactive waste and all the spent fuel in their territory (the national inventory), including future potential arisings, with due consideration of long-term management by disposal. Member States have flexibility in providing (part of) the requested information under this section G and/or under section K (Implementation of the national programme).

Member States may choose to refer to publically available documents to illustrate key examples.

How licence holders provide for and maintain adequate financial and human resources should preferentially be dealt with in sections H and I.

As shown in Appendix 1, the obligations referred to license holders in Article 7 of the Directive are dealt in the JC report only partially and split in different articles; therefore the direct use of certain parts of the JC report might be difficult in this section.

H. Expertise and skills (Article 8)

Article 8 – Expertise and skills

Member States shall ensure that the national framework require all parties to make arrangements for education and training for their staff, as well as research and development activities to cover the needs of the national programme for spent fuel and radioactive waste management in order to obtain, maintain and to further develop necessary expertise and skills.

Member states should provide in section E (National framework) a succinct description of the legislation that requires all parties to make arrangements for education and training for their staff, as well as for research and development activities, as requested in Article 8.

In section H, Member States should illustrate by using key examples or other measures (or references to publically available reports) how they deal with the implementation of Article 8, especially with regard to the timeframes and needs of the national programme.

Member States are not required to provide comprehensive overviews for all aspects and for all parties involved, but should aim at identifying relevant examples and illustrations of key importance for meeting the objectives of the Directive and for successfully implementing the national programme.

I. Financial resources (Article 9)

Article 9 – Financial resources

Member States shall ensure that the national framework require that adequate financial resources be available when needed for the implementation of national programmes referred to in Article 11, especially for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators.

This section should give an overview of the system for financial arrangements for spent fuel and radioactive waste management ensuring that:

- the financial resources required are identified, sufficient and available when needed within the national framework taking due account of the responsibility of spent fuel and radioactive waste generators;
- adequate financial resources are made available to ensure the safety of spent fuel and radioactive waste management facilities during operational lifetimes and for decommissioning;
- adequate financial provision is made which will enable siting, design, construction, operation and closure of disposal facilities;
- adequate financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility;
- financial resources are available also in cases such as:
    - premature closure of facilities;
    - management of radioactive waste, the generator of which does not exist anymore.

Member States are encouraged to provide an assessment of the adequacy of the financial provisions for the implementation of their national programme and how the financial provisions are made available when needed. However, these assessments should not include a detailed assessment of the national programme costs, which is a mandatory element of the national programme (see Article 12.1(h)).

Regarding the possible use of the information provided for the JC report, although the requirements of the JC are different from those of the Directive, a common text could possibly be used to explain the financing system in both reports.

J. Transparency (Article 10)

Article 10 – Transparency

1. Member States shall ensure that necessary information on the management of spent fuel and radioactive waste be made available to workers and the general public. This obligation includes ensuring that the competent regulatory authority inform 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 such as, inter alia, security, recognised in national legislation or international obligations.
2. Member States shall ensure that the public be given the necessary opportunities to participate effectively in the decision- making process regarding spent fuel and radioactive waste management in accordance with national legislation and international obligations.

The National Report should contain a description of the legal arrangements that establish the requirements for making information available to the public, workers and other stakeholders on the management of spent fuel and radioactive waste, including enabling effective public participation in the decision-making process regarding spent fuel and radioactive waste management.

Important new elements of the national framework should be highlighted.

It should also contain an overview of the regulatory authority's communication strategy, including descriptions of:

- how the regulatory authority provides information and communicates in its fields of competence to the general public and to workers (e.g. via website, reports, workshops, conferences, interaction with the media, etc.);
- the type of information provided and the languages used (e.g. translation into English);
- the frequency of information provision, including arrangements for ensuring that the information provided is up to date and easily accessible;
- the involvement of neighbouring countries;
- particular arrangements for providing information in emergency situations;
- the categories of information that are not being provided and the legal basis that is limiting the access to information and appeal mechanisms.

Furthermore, it should contain an overview of public participation in the decision-making process, including:

- opportunities for the public to participate effectively in accordance with national legislation and international obligations (e.g. consultations, hearings);
- how the views of the public are taken into account.

In particular, Member States should include, if available, key examples of public participation activities.

In the field of transparency, the requirements of the JC and those of the Directive vary significantly. This makes it difficult for Member States to provide the same kind of information for the JC report and this report.

K. Implementation of the national programme (Articles 11 and 12)

Article 11 – National programmes

1. Each Member State shall ensure the implementation of its national programme for the management of spent fuel and radioactive waste ('national programme'), covering all types of spent fuel and radioactive waste under its jurisdiction and all stages of spent fuel and radioactive waste management from generation to disposal.
2. Each Member State shall regularly review and update its national programme, taking into account technical and scientific progress as appropriate as well as recommendations, lessons learned and good practices from peer reviews.

Article 12 – Contents of national programmes

1. The national programmes shall set out how the Member States intend to implement their national policies referred to in Article 4 for the responsible and safe management of spent fuel and radioactive waste to secure the aims of this Directive, and shall include all of the following:
   (a) the overall objectives of the Member State's national policy in respect of spent fuel and radioactive waste management;
   (b) the significant milestones and clear timeframes for the achievement of those milestones in light of the over- arching objectives of the national programme;
   (c) an inventory of all spent fuel and radioactive waste and estimates for future quantities, including those from decommissioning, clearly indicating the location and amount of the radioactive waste and spent fuel in accordance with appropriate classification of the radioactive waste;
   (d) the concepts or plans and technical solutions for spent fuel and radioactive waste management from generation to disposal;
   (e) the concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term;
   (f) the research, development and demonstration activities that are needed in order to implement solutions for the management of spent fuel and radioactive waste;
   (g) the responsibility for the implementation of the national programme and the key performance indicators to monitor progress towards implementation;
   (h) an assessment of the national programme costs and the underlying basis and hypotheses for that assessment, which must include a profile over time;
   (i) the financing scheme(s) in force;
   (j) a transparency policy or process as referred to in Article 10;
   (k) if any, the agreement(s) concluded with a Member State or a third country on management of spent fuel or radioactive waste, including on the use of disposal facilities.
2. The national programme together with the national policy may be contained in a single document or in a number of documents.

The national programme is a key element in the Directive, with the function "to ensure the transposition of political decisions into clear provisions for the timely implementation of all steps of spent fuel and radioactive waste management from generation to disposal" (Recital 28).

In the National Report, Member States should:

- summarise the key elements of the national programme and the implementation timeframes and milestones envisaged, with an overall statement on the progress made;
- include a link to the national programme as submitted to the Commission;

- present the progress made in the implementation of the national programme (e.g. work in progress, delays, etc.) in respect to the mandatory elements specified in Articles 12.1(a), (b), (d) – (k). Member States may choose to give examples regarding licensing processes or safety demonstrations of facilities which are relevant to the progress of the national programme;
- describe the processes for reviewing and updating the national programme, including how progress in research, scientific and technical development are taken into account; Member States may give examples of scientific or technical developments that led to relevant changes in the national programme;
- report changes in the national programme (including at least those that are significant and that have been notified to the Commission, see Article 13);
- explain what measures (key performance indicators) are implemented to monitor progress in the national programme (see Article 12.1(g));
- explain, if relevant, what measures are defined and/or implemented to deal with the consequences of important delays in the implementation of the national programme.

For this section, Member States might choose to use fragments of their JC report sections A and K.

L. Peer reviews and self-assessments (Article 14.3)

Article 14 – Reporting

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, competent regulatory authority and/or national programme with the aim of ensuring that high safety standards are achieved in the safe management of spent fuel and radioactive waste. The outcomes of any peer review shall be reported to the Commission and the other Member States, and may be made available to the public where there is no conflict with security and proprietary information.

Member States are to report if a self assessment and/or peer review[8] has taken place in the last three years. They are also encouraged to report on future planning with regard to such activities.

Member States are encouraged to highlight the significant outcomes (recommendations, lessons learned and good practices) of self assessments and/or peer reviews conducted within the last three years, including information on if and how these outcomes have influenced the national programme or other actions resulting from them.

For this section, Member States might choose to use fragments of their JC report section K.

[8] Article 14.3 requires Members States to report the outcomes of any peer review to the Commission and the other Member States. This obligation can be fullfilled within the National Report or separately.

M. Future plans to improve safe and responsible management of spent fuel and radioactive waste

Member States are encouraged to provide an overview of their future plans and concrete actions that they have defined or envisage to improve their safe and responsible management of spent fuel and radioactive waste.

Member States are also encouraged to report in the subsequent reporting cycles the progress made, the lessons learnt, and/or the challenges met in this respect.

For this section, Member States might choose to use fragments of their JC report section K.

Appendix 1: Synergies between the Directive and the Joint Convention reporting

Member States when reporting to the Commission under Article 14.1 may take advantage of the review and reporting under the Joint Convention.

In order to assist Member States in generating the information to be reported in both National reports in an efficient and coherent way, allowing them to optimize the resources required for both reporting obligations, the table below has been produced. This table compares for all sections the information required and identifies where and how Member States can use the same information in both National Reports, and where different requirements have to be addressed.

It is for Member States to evaluate and decide if they combine the reporting obligations from the Joint Convention and from the Directive in two separate National Reports or if they opt for a unique National Report.

The following notes aim to explore synergies between the national reports to the Joint Convention (hereinafter "JC") and the Directive national reports, with the intention to facilitate optimizing work in the drafting of national reports under the Directive (hereinafter "the Directive").

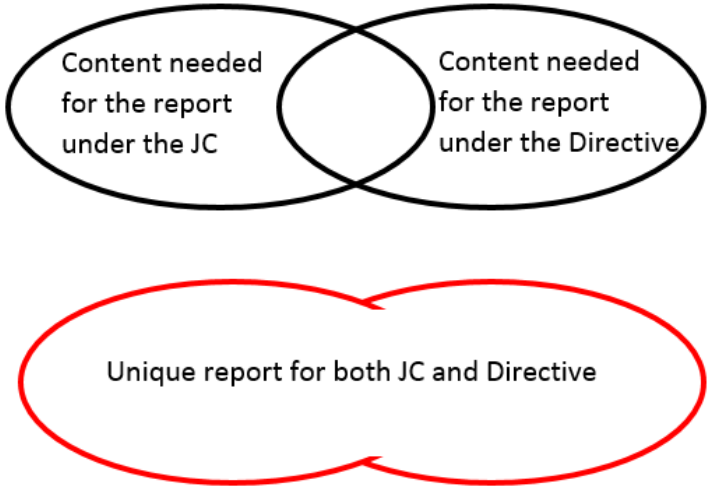
Member States may adopt two possible approaches in order to take advantage of these synergies:

1. Maintaining two different reports for the JC and the Directive, whereas having that report (of the Directive) drafted in such a way that as much information as possible would be of common use.
2. Producing a unique report covering the needs of the JC and the Directive.

General ideas for the first approach: Member States may opt for two different reports for the Directive and the JC, while optimizing as much as possible their contents. In this case, the following notes refer to the report under the Directive following the structure proposed by the Guidelines. This is a list of suggestions on this optimized reporting based on a comparison between the texts of the JC and the Directive. When two columns are represented, the contents of the JC appears in the left column and the corresponding provisions of the Directive on the right side.

In the references to national reports to the JC, consideration is given to the INFCIRC/604/Rev.3 (2014) "Guidelines regarding the Form and Structure of National Reports".

General ideas for the second approach: If the Member State prefers to produce a unique report for the Directive and the JC, the information given needs to be maximized, that means, going in some occasions beyond the needs of one of the reports, covering the requirements of both. The idea would be to consider that unique report as a "union of sets", like in the drawing given:



In some parts, it might be rather difficult to produce a unique report. Two main challenges can be observed:

1. First, the fact that some provisions of the JC do not exist in the Directive and vice-versa. When the Directive goes beyond the provisions of the JC, it seems clear that the report must reflect compliance with the Directive in accordance with the saying "*he, who can do more, can do less*". At the same time, there are also some articles in the JC that do not have any equivalence in the Directive. These are the following:
    - Detailed parts of a number of articles in Chapters 2 (management of spent fuel) and 3 (management of radioactive waste)
    - Operational Radiological Protection (Article 24)
    - Emergency preparedness (Article 25)
    - Decommissioning (Article 26 paragraphs ii, iii and iv)
    - Disused sealed sources (Article 28).

    In these cases, it will be necessary to keep the references to those chapters as they currently exist in the reports under the JC.

2. In particular, the structure of the JC is "bifurcated" at a given stage, where chapter 2 of the JC relates to the management of spent fuel and chapter 3 to the management of radioactive waste, affecting the rest of chapters to both types of management. As a reflection of this

“bifurcation”, the standard report under the JC lays down a section “G” for spent fuel management and a “symmetric” section “H” for radioactive waste management. This does not occur in the Directive, where all articles potentially affect in the same manner to the management of spent fuel and radioactive waste and in principle no distinction is made, neither in the text of the Directive, nor in the national report.

In view of this discrepancy in the structure of the legal texts and the correlative national reports (i.e., “bifurcation” *versus* joint treatment), a possibility for drafting a common report could be to keep the specificity of the JC, maintaining Sections G and H, and thus when relevant explain “twice” how the provisions of the Directive are implemented: once for spent fuel management and once for radioactive waste management.

STRUCTURE PROPOSED FOR THE NATIONAL REPORTS UNDER THE DIRECTIVE:
A. Introduction **B. Recent developments** **C. Scope and inventory (Article 2, Article 12.1(c), Article 14.2(b))** **D. General principles and policies (Article 4)** **E. National framework (Article 5)** **F. Competent regulatory authority (Article 6)** **G. License holders (Article 7)** **H. Expertise and skills (Article 8)** **I. Financial resources (Article 9)** **J. Transparency (Article 10)** **K. Implementation of the national programme (Articles 11 and 12)** **L. Peer Reviews and self-assessments (Article 14.3)** **M. Future plans to improve safe and responsible management of spent fuel and radioactive waste** **Annexes**

A. INTRODUCTION

B. RECENT DEVELOPMENTS

Section A "Introduction" and Section B "Recent developments" for the national report under the Directive can include information contained in the respective Sections A and B of the JC national report, which, according to INFCIRC/604/Rev.3, deal with the "Introduction" and "Policies and Practices".

C. SCOPE AND INVENTORY (ARTICLE 2, ARTICLE 12.1(C), ARTICLE 14.2(B))

In the JC, there are several aspects where the Contracting Parties need to make a declaration as to where they lay down the limits in the application of the Convention. This is not the case in the Directive. Member States do not have a choice under the Directive to determine what waste is covered by its scope, apart from the fact that they set their policy in reprocessing and return of used sources.

Article 3 of the JC:	Article 2 of the Directive:
This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management. *This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.* *This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence*	*1. This Directive shall apply to all stages of:* *(a) spent fuel management when the spent fuel results from civilian activities;* *(b) radioactive waste management, from generation to disposal, when the radioactive waste results from civilian activities.* *2. This Directive shall not apply to:* *(a) waste from extractive industries which may be radioactive and which falls within the scope of Directive 2006/21/EC;* *(b) authorised releases.* *3. Article 4.4 of this Directive shall not apply to:* *(a) repatriation of disused sealed sources to a supplier or*

programmes, unless declared as spent fuel or radioactive waste for the purposes of this *Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.* *This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.*	*manufacturer;* *(b) shipment of spent fuel of research reactors to a country where research reactor fuels are supplied or manufactured, taking into account applicable international agreements;* *(c) the waste and spent fuel of the existing Krško nuclear power plant, when it concerns shipments between Slovenia and Croatia.* *4. This Directive shall not affect the right of a Member State or an undertaking in that Member State to return radioactive waste after processing to its country of origin where:* *(a) the radioactive waste is to be shipped to that Member State or undertaking for processing; or* *(b) other material is to be shipped to that Member State or undertaking with the purpose of recovering the radioactive waste.* *This Directive shall not affect the right of a Member State or an undertaking in that Member State to which spent fuel is to be shipped for treatment or reprocessing to return to its country of origin radioactive waste recovered from the treatment or reprocessing operation, or an agreed equivalent.*

<table>
<tr><th colspan="2">D. GENERAL PRINCIPLES AND POLICIES (ARTICLE 4)</th></tr>
<tr><th colspan="2">STATE'S ULTIMATE RESPONSIBILITY (Article 4.1 and 4.2 of the Directive):</th></tr>
<tr><td colspan="2">The text to explain compliance with this article can be coincident in both reports, considering the reference to the processing or reprocessing activities in Article 4.2.</td></tr>
<tr><td>Article 21: [the first paragraph establishes the prime responsibility of the license holder]

2. If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.</td><td>Article 4:

1. (…)Without prejudice to Article 2.3, each Member State shall have ultimate responsibility for management of the spent fuel and radioactive waste generated in it.
2. Where radioactive waste or spent fuel is shipped for processing or reprocessing to a Member State or a third country, the ultimate responsibility for the safe and responsible disposal of those materials, including any waste as a by-product, shall remain with the Member State or third country from which the radioactive material was shipped.</td></tr>
<tr><th colspan="2">MINIMIZATION OF GENERATION (article 4.3(a) of the Directive):</th></tr>
<tr><td colspan="2">In the JC report the information is split in different parts. Nevertheless, the same information can be used in both reports. The application of this principle under the Directive could be illustrated by the same examples that are given for the JC.</td></tr>
<tr><td>• In section G (Spent Fuel): article 4.2: Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards. In so doing, each Contracting Party shall take the appropriate steps to: ii) ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted.
• In section H (radioactive waste): article 11.2: Each Contracting Party shall take the appropriate steps to ensure that at all stages of</td><td>Article 4.3(a):

the generation of radioactive waste shall be kept to the minimum which is reasonably practicable, both in terms of activity and volume, by means of appropriate design measures and of operating and decommissioning practices, including the recycling and reuse of materials;</td></tr>
</table>

radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards. In so doing, each Contracting Party shall take the appropriate steps to: ii) ensure that the generation of radioactive waste is kept to the minimum practicable;	
INTERDEPENDENCIES (article 4.3(b) of the Directive):	
In the JC report, the information is split in different parts. Nevertheless, it is possible to use the same information in both reports. The application of this principle under the Directive could be illustrated by the same examples that are given for the JC.	
• In section G (spent fuel), article 4: *(…) each Contracting Party shall take the appropriate steps to: iii) take into account interdependencies among the different steps in spent fuel management;* • In section H (radioactive waste), Article 11: *(…) each Contracting Party shall take the appropriate steps to: iii) take into account interdependencies among the different steps in radioactive waste management;*	Article 4 (3b): *the interdependencies between all steps in spent fuel and radioactive waste generation and management shall be taken into account;*
SAFE MANAGEMENT IN THE LONG TERM, PASSIVE SAFETY FEATURES (article 4.3(c) of the Directive):	
There is no equivalent content in the JC as that of Article 4.3.c of the Directive, although some of the principles of Articles 4 and 11 of the JC would fall under the umbrella of "safe management, including in the long term with passive safety features". For this reason the report under the JC requires a dedicated and more specific description of measures for each of the particular principles that are established in the relevant articles.	
There is no equivalent content in the JC. See for comparison in the JC Article 4, (i, iv, v and vi) (spent fuel), and Article 11 (i, iv, v and vi) (radioactive waste).	Article 4 (3c): *spent fuel and radioactive waste shall be safely managed, including in the long term with passive safety features;*
GRADED APPROACH (article 4.3(d) of the Directive):	
Article 4(d) of the Directive does not have a direct correlation in the JC. However, numerous articles of chapters 2 and 3 of the JC (sections G and H in the	

JC report) can be used to describe how the principle of graded approach work in practice.	
There is no equivalent content in the JC.	Article 4.3(d): *implementation of measures shall follow a graded approach;*
POLLUTER PAYS (article 4.3(e) of the Directive):	
The meaning of the principle of avoidance of undue burdens to future generations, as established in Articles 4vii/11vii of the JC, is not coincident with that of "polluter pays" of Article 4.3(e) of the Directive. – On the one hand, avoiding imposing undue burdens on future generation is a general principle that includes not only financial measures but also safety measures, including long-term safety. – On the other hand, speaking strictly about financing mechanisms, avoiding burdens to future generation does not necessarily mean that the (current) "polluter pays": it can also be the State, i.e. the taxpayer, as long as the current funds cover future needs. The JC does not require that the polluter pays; it only requires that the funds are available when needed, without mention to its source –see Article 22 and Article 26.1. of the JC. Both considerations mean that it is not possible to establish a total correlation between the principle of "polluter pays" and the principle of prevention of undue burdens to future generations. The polluter pays principle under the Directive is further developed in article 9 of the Directive, and will be dealt with more detail in the respective section.	
• (In section G (spent fuel), article 4: *each Contracting Party shall take the appropriate steps to: vii) aim to avoid imposing undue burdens on future generations.* • In section H (radioactive waste), article 11 vii) with the same content.	Article 4.3(e): *the costs for the management of spent fuel and radioactive waste shall be borne by those who generated those materials*;
EVIDENCE-BASED AND DOCUMENTED DECISION-MAKING PROCESSES (Article 4.3(f) of the Directive):	
Article 4(f) of the Directive does not have a direct correlation in the JC. However, numerous articles of chapters 2 and 3 of the JC (sections G and H in the JC report) can be used to describe how putting in place documented decision-making processes work in practice –for example in the licensing process of	

facilities.	
There is no equivalent content in the JC.	Article 4 (3f): *an evidence-based and documented decision-making process shall be applied with regard to all stages of the management of spent fuel and radioactive waste*.
EXPORT CONTROL REGIME (article 4.4 of the Directive):	
In the EU, the Shipments Directive is "translating" into Euratom law the requirements of Article 27 JC (ref. to Council Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel). Considering the conjunction of the Shipments Directive and the Directive, it can be said that the EU regime is more restrictive in the export of radioactive waste than the international regime based on the JC. Although this part is not coincident, the same information can be used to illustrate the provisions of the JC and Directive.	
ARTICLE 27.Transboundary movement 1. *Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments.* *In so doing:* *(i) a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;* *(ii) transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;* *(iii) a Contracting Party which is a State of destination shall consent to*	Article 4: *4. Radioactive waste shall be disposed of in the Member State in which it was generated, unless at the time of shipment an agreement, taking into account the criteria established by the Commission in accordance with Article 16.2 of Directive 2006/117/Euratom, has entered into force between the Member State concerned and another Member State or a third country to use a disposal facility in one of them.* *Prior to a shipment to a third country, the exporting Member State shall inform the Commission of the content of any such agreement and take reasonable measures to be assured that:* *(a) the country of destination has concluded an agreement with the Community covering spent fuel and radioactive waste management or is a party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ('the Joint Convention');* *(b) the country of destination has radioactive waste management*

a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention; *(iv) a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;* *(v) a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.* *2. A Contracting Party shall not licence the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.* *3. Nothing in this Convention prejudices or affects:* *(i) the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;* *(ii) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;* *(iii) the right of a Contracting Party to export its spent fuel for reprocessing;* *(iv) rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.*	*and disposal programmes with objectives representing a high level of safety equivalent to those established by this Directive; and* *(c) the disposal facility in the country of destination is authorised for the radioactive waste to be shipped, is operating prior to the shipment, and is managed in accordance with the requirements set down in the radioactive waste management and disposal programme of that country of destination.*

<table>
<tr><th colspan="2">E. NATIONAL FRAMEWORK (Article 5)</th></tr>
<tr><td colspan="2">In the national report for the Directive, the part of the report for the JC can be reproduced as far as the parts underlined below are added. Reference should be made to the fact that the national framework is improved when necessary, "taking due account of operating experience, etc."</td></tr>
<tr><td>Article. 18: Implementing measures

Article 19. Legislative and regulatory framework.

This article covers:
Safety requirements and regulations
System of licensing
System of prohibition of operation without a license
System of institutional control, inspections and reporting
Measures of enforcement
Allocation of responsibilities</td><td>Article 5. The concept of national framework includes [the parts underlined are those not being required under the JC]:
<u>National programme</u>
National arrangements for safety.
System of licensing, including the prohibition of operation without a license
System of appropriate control, <u>a management system</u>, regulatory inspections, documentation and reporting (…) <u>including in the post-closure period</u>.
Measures of enforcement
Allocation of responsibilities
<u>National requirements for public information and participation</u>
<u>Financing scheme</u>.
It must be ensured that the national framework is improved "taking into account operating experience, insights gained from the decision-making process (… and the development of relevant technology and research".</td></tr>
</table>

F. COMPETENT REGULATORY AUTHORITY (ARTICLE 6)	
This part could be fully coincident in both reports.	
Article 20. Regulatory body. This article covers: • Existence of a regulatory body "*provided with authority, competence and adequate and human resources*" • Effective independence	Article 6. Regulatory body. This article covers: • Existence of a regulatory body • Effective independence • "*Given the legal powers and human and financial resources*"
G. LICENSE HOLDERS (ARTICLE 7)	
PRIME RESPONSIBILITY OF THE LICENSE HOLDER (Article 7(1)):	
This part could be fully coincident in both reports.	
Article 21.1 *Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility*.	Article 7.1: *Member States shall ensure that the prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities rest with the licence holder. That responsibility cannot be delegated*.
SAFETY ASSESSMENT (article 7(2)):	
The requirement under the JC is not coincident with that of the Directive. The JC makes a distinction between the conditions needed to obtain the building permit and the operating permit. Also, separate sections (sections G & H) deal with spent fuel management facilities (G) and radioactive waste management facilities (H) In general terms, the kind of information required at the report under the JC is more detailed and goes deeper into the technical aspects. Nevertheless, the same information can be used in both reports if the Member State so wishes. The application of this principle under the Directive could be illustrated by the same examples that are given for the JC. In that case, the information provided will go beyond the requirement of the Directive.	
• In section G (spent fuel): Article 8: *Assessment of safety of facilities: Each Contracting Party shall take the appropriate steps to ensure that:* *i) before construction of a spent fuel management facility, a*	Article 7.2: *Member States shall ensure that the national framework in place require licence holders, under the regulatory control of the competent regulatory authority, to regularly assess, verify and continuously improve,*

systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out; *ii) before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).* • In section H (radioactive waste): article 15: *Assessment of safety of facilities: Each Contracting Party shall take the appropriate steps to ensure that:* *i) before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;* *ii) in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;* *iii) before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).*	*as far as is reasonably achievable, the safety of the radioactive waste and spent fuel management facility or activity in a systematic and verifiable manner. This shall be achieved through an appropriate safety assessment, other arguments and evidence.*

<table>
<tr><th colspan="2">SAFETY DEMONSTRATION (Article 7(3)):</th></tr>
<tr><td colspan="2">The provision in the Directive not only requires the performance of a safety demonstration, but it makes it subject to a principle of graded approach and requires this under different conditions: normal operating conditions, anticipated operational occurrences and design basis accidents. Besides, consideration is done to the prevention of accidents and mitigation of its consequences. As this requirement is not coincident with that of the JC (see below), the information provided under the report for the JC is not sufficient to assure compliance with the Directive.</td></tr>
<tr><td>For spent fuel,
In the design and construction of facilities, Article 7: Each Contracting Party shall take the appropriate steps to ensure that: (iii) the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.
In the operation of facilities, Article 9: Each Contracting Party shall take the appropriate steps to ensure that: (i) the licence to operate a spent fuel management facility is (…) conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements.
For radioactive waste,
In the design and construction, Article 14: (iv) the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.
In the operation of facilities, Article 16: (i) the licence to operate a radioactive waste management facility is (…) conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;</td><td>Article 7.3. As part of the licensing of a facility or activity the safety demonstration shall cover the development and operation of an activity and the development, operation and decommissioning of a facility or closure of a disposal facility as well as the post- closure phase of a disposal facility. The extent of the safety demonstration shall be commensurate with the complexity of the operation and the magnitude of the hazards associated with the radioactive waste and spent fuel, and the facility or activity. The licensing process shall contribute to safety in the facility or activity during normal operating conditions, anticipated operational occurrences and design basis accidents. It shall provide the required assurance of safety in the facility or activity. Measures shall be in place to prevent accidents and mitigate the consequences of accidents, including verification of physical barriers and the licence holder’s administrative protection procedures that would have to fail before workers and the general public would be significantly affected by ionising radiation. That approach shall identify and reduce uncertainties.</td></tr>
</table>

INTEGRATED MANAGEMENT SYSTEMS (Article 7.4):	
The Directive goes beyond the contents of the JC, as the concept of "integrated management systems" supersedes that of "quality assurance". Therefore, a text that accomplishes the requirements of the Directive can be used for both reports.	
Article 23: *Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.*	Article 7.4. *Member States shall ensure that the national framework require licence holders to establish and implement integrated management systems, including quality assurance, which give due priority for overall management of spent fuel and radioactive waste to safety and are regularly verified by the competent regulatory authority.*
FINANCIAL AND HUMAN RESOURCES (article 7(5)):	
The requirements of both instruments are equivalent, although split in different parts of the JC report. It must be noted that a specific requirement is included in the JC for decommissioning activities, which is not explicited in the Directive.	
• Article 22: *Each Contracting Party shall take the appropriate steps to ensure that: i) qualified staff are available as needed for safety related activities during the operating lifetime of a spent fuel and a radioactive waste management facility*; • Specific provision for decommissioning: Article 26: *Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that: i) qualified staff and adequate financial resources are available.*	Article 7.5: *Member States shall ensure that the national framework require 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 as laid down in paragraphs 1 to 4*.
H. EXPERTISE AND SKILLS (ARTICLE 8)	
Article 8 of the Directive refers to "all parties" in the national framework. There is no equivalent provision in the JC. Only the national report for the Directive must include the efforts to undertake adequate training for the staff and participation in R&D activities as this is not a requirement under the JC.	
	Article 8: *Member States shall ensure that the national framework require all parties to make arrangements for education and training for their staff, as well as research and development activities to cover the needs of the*

	national programme for spent fuel and radioactive waste management in order to obtain, maintain and to further develop necessary expertise and skills.
I. FINANCIAL RESOURCES (ARTICLE 9)	
See comments above for article 4.3(e). Both provisions cover the operation and post-closure period of the facilities –in the case of the Directive, because the national programmes include "*the concepts or plans for the post-closure period of a disposal facility's lifetime, including the period during which appropriate controls are retained and the means to be employed to preserve knowledge of that facility in the longer term*" - Article 12.1(e)) of the Directive. As has been explained for Article 4.3(e), the polluter pays principle is only a requirement under the Directive. The information given for Article 22 JC can be used in the national report under the Directive, as long as the system described complies with the polluter pays principle.	
• General provision: Article 22: *Each Contracting Party shall take the appropriate steps to ensure that:* *ii) adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;* *iii) financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility*. • Specific provision for decommissioning: Article 26: *Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that: i) qualified staff and adequate financial resources are available;* (…).	• Article 9: *Member States shall ensure that the national framework require that adequate financial resources be available when needed for the implementation of national programmes referred to in Article 11, especially for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators*. • See also Article 4. 3 (e) (basic principle) and 7(5) (required to the license holders).

<table>
<tr><th colspan="2">J. TRANSPARENCY (ARTICLE 10)</th></tr>
<tr><td colspan="2">In the JC, the requirement of public information is only mentioned for the siting of proposed facilities. The requirement of public participation is not acknowledged. This means that the obligations under the Directive go beyond the JC. The information provided for the JC report can only be partially used.</td></tr>
<tr><td>For spent fuel: Article 6: Siting of proposed facilities: 1. Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility: (…) (iii) to make information on the safety of such a facility available to members of the public;
For radioactive waste: Article 13: Siting of proposed facilities: 1. Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility: (iii) to make information on the safety of such a facility available to members of the public;</td><td>Article 10: 1. Member States shall ensure that necessary information on the management of spent fuel and radioactive waste be made available to workers and the general public. This obligation includes ensuring that the competent regulatory authority inform 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 such as, inter alia, security, recognised in national legislation or international obligations.

3. Member States shall ensure that the public be given the necessary opportunities to participate effectively in the decision- making process regarding spent fuel and radioactive waste management in accordance with national legislation and international obligations.</td></tr>
<tr><th colspan="2">K. IMPLEMENTATION OF THE NATIONAL PROGRAMME (ARTICLES 11 AND 12)

L. PEER REVIEWS AND SELF-ASSESSMENTS (ARTICLE 14.3)

M. FUTURE PLANS TO IMPROVE SAFE AND RESPONSIBLE MANAGEMENT OF SPENT FUEL AND RADIOACTIVE WASTE</th></tr>
<tr><td colspan="2">Only the Directive requires the drafting and adoption of national programmes, Articles 11 and 12 having no equivalence in the JC. The reporting obligations of Article 14 also differ substantially from those of Article 32 of the JC.

JC reports typically include a “section K” on challenges, potential areas for improvement, etc.

In the national reports under the Directive, sections K to M can have similarities with section K of the JC.</td></tr>
</table>

ANNEXES	
Member States may choose to make use of annexes to illustrate or provide additional information on relevant parts of their national report. Below is a list of suggested annexes under the JC national report.	
INFCIRC 604 Rev. 3, "Guidelines regarding the Form and Structure of National Reports", ***Section L. Annexes*** *38. The following may be included as annexes to the National Reports:* *(a) List of spent fuel management facilities;* *(b) List of radioactive waste management facilities;* *(c) List of nuclear facilities in the process of being decommissioned;* *(d) Inventory of spent fuel;* *(e) Inventory of radioactive waste;* *(f) References to national laws, regulations, requirements, guides, etc.;* *(g) References to official national and international reports related to safety;* *(h) References to reports on international review missions performed at the request of a Contracting Party; and* *(i) Other relevant material.*	

Appendix 2: Reporting of inventories and the future prospects under the Directive

1. Aim of the appendix

This appendix 2 provides Member States with more detailed guidelines to assist them in reporting of inventories and the future prospects as required under Article 14.

As indicated in the guidelines (see section II.C), ENSREG recommends that Member States ensure that updated information on inventories and estimates of future quantities is presented in the National Report.

2. Main considerations

All EU Member States (MS) have a national radioactive waste classification system as a central element of the national waste management system. The definition and application of a national waste classification system is a national responsibility.

In the national waste classification of radioactive waste the boundaries between waste classes are determined on the basis of qualitative and/or quantitative factors that are directly related to specific (operational or planned) disposal facilities (design, safety assessment, site characteristics, …) or to more generic disposal concepts (engineered surface or near-surface disposal, subsurface disposal at greater depth, deep geological disposal, …). A consequence of the differences of these determining factors is that the specificities of the main waste classification categories for the long-term management will differ to various extents between MS.

Member States can deliver the inventory and the future prospects according their national classification system. In order to make the information comparable on the Community's territory, Member States are recommended to provide a table to translate their national inventory into the IAEA classification system (IAEA Safety Guide “Classification of Radioactive Waste” GSG-1, 2009) or directly report their inventory according to IAEA classification system.

Additional information on the IAEA radioactive waste classification system and its relationship with the 1999 EC Recommendations on Radioactive Waste Classification is provided in the Table below.

Inventory reporting by Member States should clearly indicate the units on which the inventory is based and the reference dates. Member States can use the latest inventory reported under Joint Convention or update.

3. Reporting of current inventories

3.1 Radioactive waste

The inventory should comprise all radioactive waste (nuclear facilities operation and on going decommissioning, medical, research and industrial applications, remediation, ...) present in the Member States territory.

MS are expected to report the following information:

- Waste volumes (m³) by category disposed of in each operational or closed disposal facilit(y)(ies). Type of disposal is expected to be reported (Borehole, Landfill, Near Surface Disposal, Geological, Deep Geological). For operational disposal facilities the existing total capacity (m³).
  Member States which have exported waste for disposal are expected to indicate the quantities concerned (volumes in m³ by category) and countries of destination, and refer to the export agreement(s).
- Waste volumes (m³) of conditioned waste by category stored in storage facilities. For unconditioned waste in storage, if possible, indication of the final conditioned volume is expected to be provided.
- For disused sealed sources declared as radioactive waste it has to be stated if they are included in the different waste categories, if not they should be reported separately.

Member States holding foreign waste for return are expected to indicate quantities and destinations (EU or non-EU countries).

3.2 Spent Fuel

MS are expected to report the following information:

- Spent fuel disposed of (tHM, number of assemblies and type - BWR, PWR, CANDU, MOX, research reactor, …);
  If shipped to another Member State or outside EU for disposal (or reprocessing without return of waste): quantities in tHM, number of assemblies and type, countr(y)(ies) of destination.
- Spent fuel in storage (tHM, number of assemblies and type (BWR, PWR, CANDU, MOX, spent fuel from research reactor, …) by store type (dry cask, vault, pool) and locations (aggregation of locations could be acceptable if this is seen as sensitive).

For spent fuel from research reactors the quantities of fuel subject to a "return" agreement is expected to be indicated.
Member States are to report separately the quantities and location of spent fuel sent abroad for reprocessing. Correspondingly Member States holding foreign fuel are expected to indicate the quantities stored from EU and non-EU countries.

4. Reporting of future prospects

4.1 Radioactive waste

Member States are expected to report the total volumes (m³) (as disposal volumes[9], if possible) of radioactive waste by category for storage and/or disposal for relevant time horizons (e.g. 2030, 2050, …) for:

- operational waste including new build (lifetime assumptions to be given);
- decommissioning waste (decommissioning assumptions to be given);

[9] disposal volume" as the total volume taken up by the waste package for disposal

- remediation;
- waste (including disused sealed sources categorized as radioactive waste) from medical, research and industrial application.

This information is expected to include waste currently stored abroad, subject to return, treatment of radioactive waste abroad or intermediate level waste (ILW)/high level waste (HLW) from reprocessing.

4.2 Spent Fuel

Member State are expected to report the following information:

Total expected quantities (tHM, number of assemblies) of spent fuel from reactors under operation, including from research reactors if return is not envisaged, and from new build (lifetime assumptions to be given) for relevant time horizons (e.g. 2030, 2050, etc.).

Radioactive waste categories - IAEA Safety Guide GSG-1	**IAEA description - IAEA Safety Guide GSG-1**	**Origin (examples)**	**Long-term Management (activities and facilities)**	**Equivalent EC Recommendation 1999 categories**
Very low level waste (VLLW)	*Waste that does not necessarily meet the criteria of exempt waste (EW), but that does not need a high level of containment and isolation and, therefore, is suitable for disposal in near surface landfill type facilities with limited regulatory control. Such landfill type facilities may also contain other hazardous waste. Typical waste in this class includes soil and rubble with low levels of activity concentration. Concentrations of longer lived radionuclides in VLLW are generally very limited.*	Mainly from decommissioning but also from other activities	disposal as hazardous chemical waste (with a very limited radioactive contamination) or as radioactive waste in landfill type facilities (low engineered surface or subsurface facility)	**Very low level waste (VLLW)**
Low level waste (LLW)	*Waste that is above clearance levels, but with limited amounts of long lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred years and is suitable for disposal in engineered near surface facilities. This class covers a very broad range of waste. LLW may include short lived radionuclides at higher levels of activity concentration, and also long lived radionuclides, but only at relatively low levels of activity concentration.*	Nuclear industry (operational and decommissioning waste) and other nuclear non-power activities (including disused sealed sources)	(1) Engineered surface or near-surface (a few meters below surface) disposal facilities (2) co-disposal with ILW (and possibly with HLW) in an engineered repository at greater depth is an alternative long-term management option (with the main requirements of the disposal system being determined by the highest waste category)	**Low and Intermediate short-lived waste**
Intermediate level waste (ILW)	*Waste that, because of its content, particularly of long lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no provision, or only limited provision, for heat dissipation during its*	Nuclear industry (operational and decommissioning waste) and other non-power	Radioactive waste containing too high activities of long-lived radionuclides, excluding it from disposal at or near the surface with LLW.	**Low and Intermediate long-lived waste**

	storage and disposal. ILW may contain long lived radionuclides, in particular, alpha emitting radionuclides that will not decay to a level of activity concentration acceptable for near surface disposal during the time for which institutional controls can be relied upon. Therefore, waste in this class requires disposal at greater depths, of the order of tens of metres to a few hundred metres.	nuclear activities (including disused sealed sources)	(1) Disposal in an engineered facility at greater depths than in the case of (near) surface disposal is required. (2) Specially engineered and purpose drilled boreholes can be an alternative option in specific cases (waste types and amount, e.g. disused sealed sources) (3) Co-disposal with HLW in one deep geological disposal facility is an option (with the main requirements of the disposal system being determined by the highest waste category)	
High-level waste (HLW)	*Waste with levels of activity concentration high enough to generate significant quantities of heat by the radioactive decay process or waste with large amounts of long lived radionuclides that need to be considered in the design of a disposal facility for such waste. Disposal in deep, stable geological formations usually several hundred metres or more below the surface is the generally recognized option for disposal of HLW.*	Vitrified waste from SF reprocessing Spent fuel considered as waste	Deep geological disposal in an engineered repository at depths of a few hundred meters or more - the heat output of the waste is a factor for facility design, operation and safety assessment.	**High-level waste**