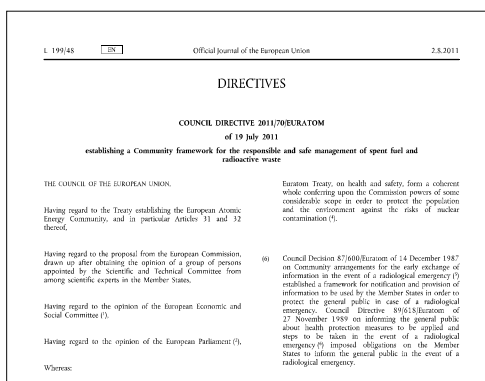




The European Waste Directive: Structure, Content and Implementation Guidance

Gunnar Buckau, JRC-ITU



Structure:

- Introduction

- Recitals (“Whereas”)

- References to other Directives, Recommendations, Agreements, ..
- Explanations and statements (also legally valid)

- Chapter 1

- Article 1 “Subject Matter”
- Article 2 “Scope”
- Article 3 “Definitions”
- Article 4 “General Principles”

-Chapter 2 Obligations

- Article 5 “National Framework”
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- Article 12 “Contents of National Programmes”
- Article 13 “Notification”
- Article 14 “Reporting”

- Chapter 3 Final Provisions

- Article 15 “Transposition”
- Article 16 “Entry into force”
- Article 17 “Addressees”



Gunnar Buckau, Swedish

1982: Graduated from Royal Institute of Technology, Stockholm, Sweden

1982 – 1994: Technical University of Munich, Institute of Radiochemistry

1992: PhD Thesis on Natural Organics/Humic Substances and Actinides

1994 – 1996: International Atomic Energy Agency, Radioactive Waste Safety Series, Overriding Issues (fundamentals, including ethical issues)

1996 – 2011: Research Centre Karlsruhe/ Karlsruher Institute of Technology, Institute for Nuclear Waste Disposal, R&D for the Disposal Safety Case & EURATOM Programme on Long-Term Safety of Disposal

2011 - : JRC-ITU, Policy Support in Nuclear Waste Management & Disposal



1. Context: EURATOM and the Commission

2. What is a Directive?

3. Waste Directive

- **General Principles / “Responsible and Safe”**
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- **Guides**
- **Workshops, Projects**

5. Summary and outlook



EURATOM Treaty: Nuclear collaboration on a European Level



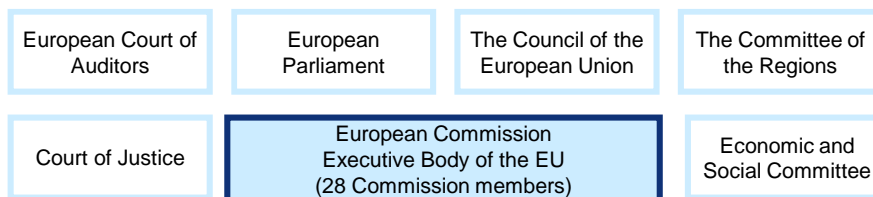
25 March 1957, EEC and EURATOM Treaties

The EURATOM Treaty has been updated, but remains in force

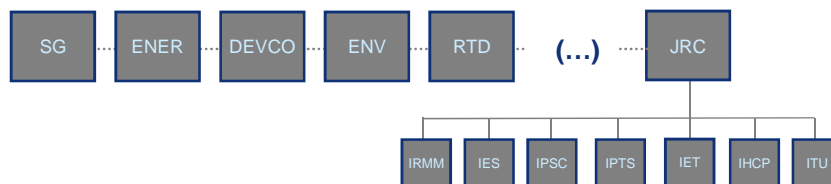
25 March 1957, signing the Treaties of Rome
The European Economic Community (now European Union) and EURATOM

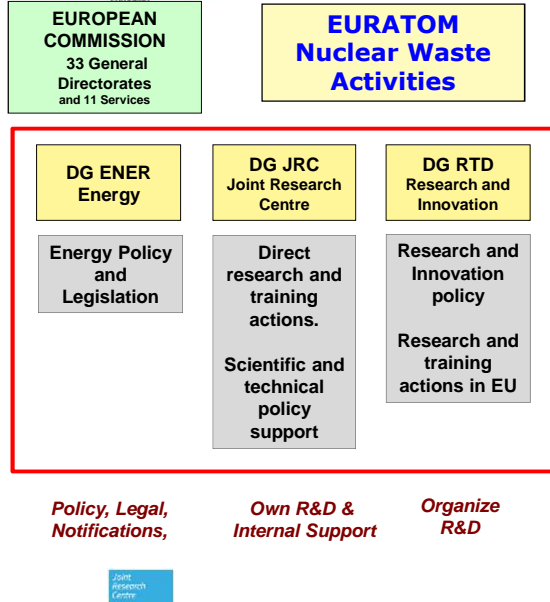


European Union Bodies



33 General Directorates and 11 Services





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Directive

Legislative act of the European Union requiring Member States to achieve a particular result **without being very prescriptive**. It in particular defines the objectives but very much leaves it to the Member States how to achieve those objectives.

EURATOM: Negotiated by the “Atomic questions group” (= negotiated by the **Member States**)

Adopted by the European Council (one representative per **Member State**)

The Directive requirements are **transposed into National Law** where the particular way of achieving the objectives in a given Member State becomes defined by the MS.

Centre



European
Commission

Waste Directive

Adopted 19 July 2011

Published 2 August 2011

Entering into force 22 August 2011

Transposition into National Law by 23 August 2013

Notification to the Commission of **National Programmes** by 23 August 2015

Tri-annual **progress reporting**, deadline for first report 23 August 2015

Peer Reviews (by individual Member States every 10 years, i.e. ≈ 3 per year)

Joint
Research
Centre



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Directive on Safe Management of Radioactive Waste

The objective is to protect against the danger of radiation

How about:

Do we need anything more?



The “Waste Directive”

Council Directive 2011/70/EURATOM

of 19 July 2011

Establishing a Community Framework for the Responsible and

Key challenge: Geological Disposal of High-Level Waste / Spent Fuel

Spent Fuel, if declared waste or not.



Safe: Understandable for persons with technical and practical background
risk, dose, operational safety,...
(in general quantifiable)

Responsible: **Ethical and Governance considerations**



Swedish NPP Programme was stopped after elections 1976: Finalization of reactors under construction conditional to demonstration that Spent Nuclear Fuel can be managed safely (Stipulation Act**).**

Scientific-Technical Proof of Safety Necessary, but not sufficient.
-> **responsible** acting.

Etik och kärnavfall: Rapport från ett seminarium om etiskt handlande under osäkerhet; Stockholm den 8-9 september 1987. SKN Rapport 28.

Ethical Aspects on Nuclear Waste: Some points discussed at a seminar on Ethical Action in the Face of Uncertainty, Stockholm, Sweden, September 8-9, 1987. SKN Report 29.

Intergenerational responsibility
Risk discounting,

...

References to SKN reports 1983 on risk discounting, 1987 on decision making, and socio-political issues



IAEA Safety Fundamentals

“The Principles of Radioactive Waste Management”
Safety Fundamentals
Safety Series 111-F
IAEA, 1995

Integrated into
“Fundamental Safety Principles”
Safety Fundamentals
Safety Series SF-1
IAEA, 2006

Recital 24:

It should be an ethical obligation of each Member State to avoid any undue burden on future generations accomplished by implementation of the Directive

Principle 4: **Protection of future generations**

Principle 5: **Burdens on future generations**

Principle 6: **National legal framework**

Principle 7: **Control of radioactive waste**

Principle 8: **Radioactive waste generation and management**

Principle 9: **Safety of facilities**

4. Safe management, long-term, passive safety features

5. Graded approach

6. Costs to be borne by the generators

7. Evidence-based decision making

8. Disposed of in MS, unless.. (Export restriction)

-> Towards Disposal End-Point



“
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Additional Aspect

Allocation of Responsibility

**For the “Activity” (“Management”) but also
For the “Material” (“Spent Fuel and Radioactive Waste”)**

Article 5.1(f): 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;

Article 4.2: 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.



“Responsible and Safe”

Safety is a pre-requisite

Safety alone is not sufficient (ethical considerations, clear policies, clear allocation of responsibilities, involvement of stakeholders, transparency,)

Realizing that Ethical/Governance considerations need to be regarded in this field is not new

Well reflected and visualized in the Waste Directive



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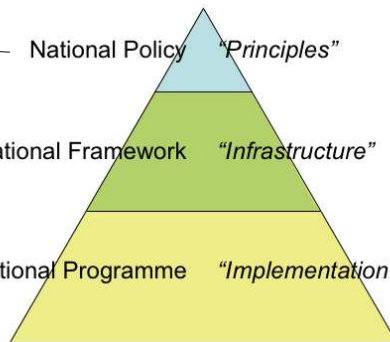
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Copied or evolving from IAEA Safety Series
and “Joint Convention”

National Policy “Principles”

National Framework “Infrastructure”

National Programme “Implementation”





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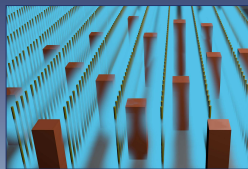
Peer character
Not legally binding



DG JRC
Joint Research
Centre

**Policy Report on
Management of Spent
Fuel and its Waste**

Management of spent nuclear fuel
and its waste



ESAC policy report no. 23
JRC Reference Report
June 2014

This report can be found at
www.easac.eu
<https://ec.europa.eu/jrc>

JRC and EASAC
Published 30 June 2014

DG ENER
Energy

**Final Guidelines for Member
States Reports to the Waste
Directive**

Final Guidelines for MS Reports
to the Waste Directive

HC_2014-275_127

ENSREG
Published 2014

DG RTD
Research and
Innovation

**RD&D Planning Towards
Geological Disposal of
Radioactive Waste
Guidance for less
advanced Programmes**

SecIGD2 Project
(Contract Number: 523240)

**RD&D Planning Towards Geological Disposal
of Radioactive Waste
DELIVERABLE (D-N°: 2.3)
Guidance for less-advanced Programmes**

Author(s): T. Beutels, B. Kuen, J. Deby, C. Becken, D. Diercke
Reporting period: e.g. 01/01/2013 - 30/06/2015
Date of issue of this report: DELIFT V1.0.1 (27th February 2015)
Start date of project: 01/01/2013 Duration: 30 Months

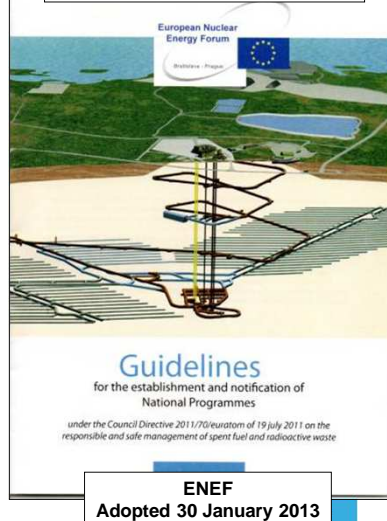
Project funded by the European Commission under the Seventh Framework Programme for Nuclear
Research & Technology Development (FP7-RTD)
Nucleonica Ltd

FP7 Nucleonica Ltd (contract number: 523240) 10 pages (10/10)

IGD-TP
Adopted 23 June 2015



**Guidelines for Establishment and
Notification of National
Programmes (art. 12.1)**



ANDRA (FR)
AREVA (FR)
CEZ (CZ)
COVRA (NL)
ENRESA (ES)
ESTONIAN Min. Env. (ET)
FORATOM (BE)
GNS (DE)
NDA (UK)
NIRAS-ONDRAF (BE)
NNF (SK)
POSIVA (FI)
SKB (SE)
SOGIN (IT)
TVO (FI)



Article 12 "Contents of National Programmes"

- **National Policy**
- **Milestones and Timeframes**
- **Inventory**
- **Concepts or Plans and Technical Solutions from Generation to Disposal**
- **Concepts, Plans for the Post-Closure Phase**
- **Research, Development & Demonstration Activities**
- **Responsibilities, Performance Indicators**
- **Cost Assessment**
- **Financing Scheme**
- **Transparency Policy or Process**
- **Agreements**

National Policy: General principles (Article 4)

Depending on the magnitude of the programme, it will include aspects such as:

- the fuel cycle policy, for example spent fuel reprocessing or direct disposal, and participation in R&D projects on advanced technologies
- role and duration of storage
- if applicable, role of reversibility and retrievability
- role of shared solutions
- contingency planning
- waste ownership/responsibility
- decision making process
- ...

Cost Assessment

Principle uncertainties:

- Lack in experience
- End-Points and Time-Scales not known

Decommissioning and LLW and ILW repositories: Abundant experience

Geological disposal: Not yet “implemented to the end”

Countries with well advanced programmes: Finland and Sweden



Finland

Started early with assessment of the total costs for all waste management (including decommissioning and disposal).

Re-assessment every year: Fluctuations decrease with time

2008: 0.16 €ct / kWh

Sweden

Collected 1 öre (≈ 0.1 €ct) / kWh

Summer 2012: Increased to ≈ 0.2 €ct / kWh* (not retroactive)

If the Disposal End-Points and Time-Scales are known!

* 2014: 0.021 – 0.024 SEK/kWh, depending on the NPP



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Workshops

- **DG ENER “Workshop on the contents and implementation of the National Programmes as defined in Articles 11 and 12 of the Nuclear Waste Directive”**
25-26 September 2012
- **ENEF-ERDO “Workshop on National Programme for small nuclear countries including shared solutions”**
4-5 December 2013
- **DG ENER “2nd Workshop on the National Programmes under Council Directive 2011/70/EURATOM Establishing a Community Framework for the Responsible and Safe Management of Spent Fuel and Radioactive Waste”**
3-4 November 2014
- **IGD-TP Workshop “PLANning geological DISposal of radioactive waste in Europe” (PLANDIS), 26 May 2015, Pitesti, Romania**



Projects

The present R&D Programme supported by DG RTD is progressively tailored towards supporting Member States in developing tools and competencies for meeting the Waste Directive requirements

Example:

**Coordination and Support Action JOPRAD (“Towards a Joint Programming on Radioactive Waste Disposal”) ->
Future “Joint Programming”**

Including reflection of the needs of Member States with “Less Advanced Programmes” in view of implementing the Waste Directive



Summary

The Member States are responsible for implementation of the Waste Directive

Notification
Reporting

DG ENER

Workshops

Projects

DG RTD

Support by the Commission, including

ENEF,
ENSREG

Guidance

Participation
– Workshops
– Projects,
– Guidance
–

DG JRC



Summary (cont.)

The Waste Directive does not fall from the sky
National developments, IAEA Safety Series, OECD-NEA activities, IAEA
Joint Convention, ...

**General/fundamental principles have evolved over decades. Now well
established, but additional ones..**

Key driver is Geological Disposal of HLW, including Spent Fuel

However, different Member States have different magnitudes of Waste

Simple safety criteria is not sufficient (“Responsible and Safe”)

Implementation is accompanied by a spectrum of support activities



Outlook

The Waste Directive will contribute to responsible and safe management of radioactive waste

The Waste Directive will contribute to common views and a more homogeneous situation in the European Union

Variety of National Programme implementation solutions will be developed for different types of challenges and national situations

Geological disposal will depend on success stories of few fore-runners

A multitude of support activities, projects, workshops,.... will continue over the coming years.

Questions?

Radioactive Waste, including spent fuel if considered waste, shall be managed in such a way as to avoid imposing undue burdens on present and future generations, burdens including:

- ***Financial (programme implementation, but also retrieval, remediation & clean-up,),***
- ***Radiological,***
- ***Environmental,***
- ***Natural resource / land-use restrictions,***
- ***Administrative (monitoring, record keeping,...),***
- ***Societal (pre-empted decision making, fear-related social stress, need for expertise continuity, ..),***