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French Management strategy for DSRS' end of life

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French Experience with repositories for radioactive waste and DSRS

- French regulation and strategy (DSRS and Nuclear Waste)
- French Manufacturer's responsibilities
- Possible improvements of the International legal framework

French regulation and strategy (1)

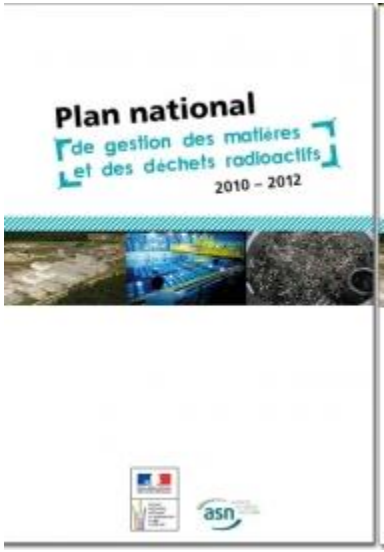
- Legal framework for the use of sources (public health code and ASN decisions) :
  - Any use/import/export of sealed sources is submitted to an authorisation delivered by the Nuclear Safety Authority (ASN)
  - The use of sealed source is limited to 10 years
    - The user is not allowed to keep a disused or outdated sources)
    - The 10 year limit can be extended to 15 or 20 years on a case by case basis and with due justification, with additional technical requirements

French regulation and strategy (2)

- No legal explicit definition of a disused sealed source
  - A source can be :
    - Used by a licensee
    - Out of date, when it is older than 10 years (or more if life time has been extended)
    - Still within its life time but no more needed by the licensee
- In the last 2 cases :
  - The licensee shall return the sealed source to its supplier, which shall :
    - *either recycle it*
    - *either ensure its disposal*
    - *either return it to its supplier etc. until the manufacturer of the source*
  - The supplier shall take back the returned source without conditions when a user requests it (*for artificial sources provided after 1990 and for all sources provided after 2002*)
  - A financial guarantee of the suppliers for the provided sourcesis requested by law
    - *Association of providers*
    - *Convention with the National Agency for Nuclear Waste (ANDRA)*
    - *Draft regulation on the financial guarantee under review*
  - National Public Fond for orphan sources managed by ANDRA

French regulation and strategy (3)

- Radioactive Waste management is submitted to specific regulation
  - ANDRA is the national agency in charge if final disposal of radioactive waste
  - The producers of radioactive wastes have to store them until they can be transferred to ANDRA disposal
  - A national *roadmap for the management of radioactive waste and radioactive material* presents the national strategy and inventory of wastes (PNGMDR)



Disused sources in France

- Inventory of 2 millions of DSRS :
  - 65% : Ionising smoke detectors' sources
  - 22% : sources used for defense purposes
  - 10,3 % : industrial sources stored by CEA and Cis-Bio
  - 1,3% : industrial and medical sources stored by ANDRA
- After recovery of a sealed source by the initial supplier or by any other licensee :
  - *A recovery certificate is issued*
  - *A decision is taken to recycle the source or to manage the source as a radioactive waste*
    - *Reuse or Recycling possibility relies on technical and economical criteria*
    - *Framework to take a decision for reuse or recycling is not explicitly defined in the legislation (time limit to take a decision?)*
  - *Radioactive wastes have to be classified in the ANDRA waste management system*
    - *stored radioactive materials are not considered as waste as long as they have a potential for future use*

ANDRA waste management strategy

activity	Short half-life	Long half-life
Very Low level (VLL)	*Surface disposal (CSTFA)*	
Low Level (LL)	*Surface disposal (CSFMA) except some H3 waste and some sealed sources*	*Dedicated sub-surface facility under study*
Intermediate Level (IL)		
High Level (HL)	*Ongoing studies, including disposal in deap geological repository*	

CSTFA (Morvilliers)

CSFMA (Aube)

Adapted criteria for Sealed sources end-life

- Concentrated activity (importance of criteria based on thermal power) + actractiveness
- LAS : limited activity per source (intrusion scenario) + limitation of thermal power / container

Activity	Short half-life		Long half-life
	≤ Co 60	≤ Co 137	
Very Low level (VLL)	*< 1Bq / source : surface disposal (CSTFA)*		
Low Level (LL)	*Surface disposal (CSFMA) except some tritium sources < 120 w*	*Surface disposal (CSFMA) if < LAS*	*Subsurface facility if < LAS*
Intermediate Level (IL)		*Geological disposal : IL-LL < 30 w*	*Geological disposal : IL-LL < 12 w*
High Level (HL)	*Geological disposal : HL-LL*		

French manufacturer's responsibilities (1)

- **CEA and Cisbio manufactured and supplied a significant number of sealed sources in the past but have ceased this activity :**
  - *Transfer of the business of sources for calibrating in 1999*
  - *Last Co60 and Cs137 sources supplied by CEA in 1984 and by Cisbio in 2005*
  - *Last high activity sources (α and neutron) supplied by CEA in 2008*
- Creation of a **Public interest grouping** in 2009 ("GIP sources") by CEA and Cis-bio to **organise the recover of previously supplied sources** *until* :
  - 2015 for Co60 and Cs137 (no life extension after 2014)
  - 2018 for α and neutron sources (no life extension after 2017)
  - 2019 for any other sources

  $\Rightarrow$ *After, no longer support provided by the manufacturer to the users !*

French manufacturer's responsibilities (2)

- **Support Plan on the safe and secure Management of DSRS of French Origin** *in the frame of the* **Practical Arrangement between the Government of the French Republic and the IAEA for the Elaboration of a French Co-operation and Support Plan for Nuclear Security**
  - 2011 : organisation of the first repatriation mission of sources of French Origin
  - Case by case authorization by ASN
  - Major difficulty :
    - Definition of French origin?
    - Any import from nuclear waste is forbidden in France
    - Transport regulation difficulties linked to the loss of special for agreement for sources -> implies special arrangements on a multilateral basis

  ⇒***legal framework of repatriation has to be clarified***

French manufacturer's responsibilities (3)

- **The management of DSRS needs more than 10 facilities to process all types of disused sources in waste packages** (gathering, interim storage, agreement of waste packages,….)
  - *40 packages of Co60 Sources or of sources with a period < Co60 are planned to be sent to ANDRA disposal from 2014 to 2023 (5m^3 cement packages produced on disposal site)*
  - *45 packages of other sources are planned to be sent to ANDRA Medium Activity geological disposal + 40 existing "historic" (870l cement packages)*
  - *High Activity DSRS will be directed to High Activity geological disposal managed in 200l metallic packages (6 packages are planned to be send to ANDRA from 2025)*

International Legal framework for disused sources (1)

- ***Joint Convention***
  - *"radioactive waste" : "no further use is foreseen" + "is controlled as radioactive waste by a regulatory body"*
- **Code of conduct on the S&S of rad. Sources**
  - *"disused source" means a radioactive source which is no longer used, and is not intended to be used, for the practice for which an authorization has been granted.*

⇨ *A disused source is not a radioactive waste as long as it is controlled as a disused source*

⇨ *Criteria for declaring a DSRS as a waste could be elaborated*

International Legal framework for disused sources (2)

- Responsibilities of the user / responsibilities of the Supplier or manufacturer are not well defined in the international legislation and standards
  - *Addressed in a different way in national legislation*
  - *Generally different responsibilities allocated than those provided for the fuel cycle industry*
  - *End of life Management considered before export takes place generally considered as good practice*
- Repatriation should be the last resort for disused sources if a commercial option or a user State solution is not available
  - Definition of „country of origin“ needs to be clarified

Conclusion

- **France**
  - *has developed a robust strategy for managing the end of life of DSRS*
  - *faces to some legal problems linked to the status of DSRS # radioactive waste*
  - *Recognizes a need for work at the international level*
- **Proposal of an Open-Ended Working Group during the next review of the Joint Convention**
  - *Address legal issues and good practices on DSRS (responsibilities, country of origins, etc.)*
  - *Discuss any possible improvements of rules, procedures and guidance of the joint convention concerning DSRS (which could be useful in particular for non-nuclear countries having ratified the Joint Convention)*
  - *A few countries next to France have already expressed to the IAEA their interest for an OEWG on these issues*

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