



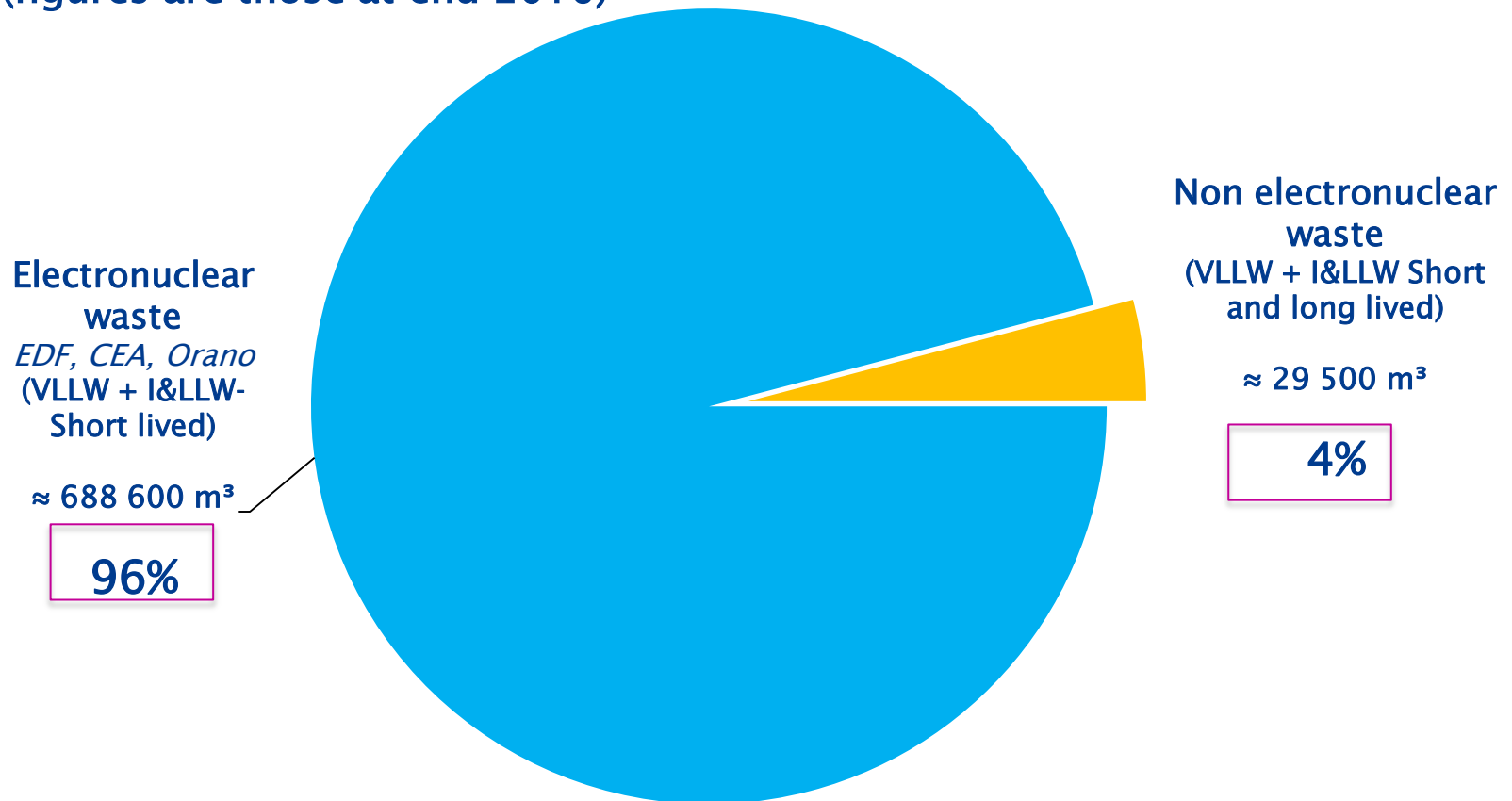
SAMIRA Conference, Session 4, Quality and Safety: challenges for the management of non-energy radioactive waste and spent fuel

21 March 2018

France

Non electronuclear waste: a specific management

Distribution of the volume of radioactive waste collected and delivered on Andra centers in the Aube department (figures are those at end 2016)



Non electronuclear waste : a large diversity

Andra collects each year more than 3 000 waste packages coming from the non electronuclear sector

Solid waste, approx. 29 t

- 16 t burnable waste
- 11 t non burnable waste
- 2 t putrescible waste

Scintillation vials, less than 17 t

Liquid waste, approx 28 t

- 3 t solvents and oils
- 25 t liquid aqueous waste

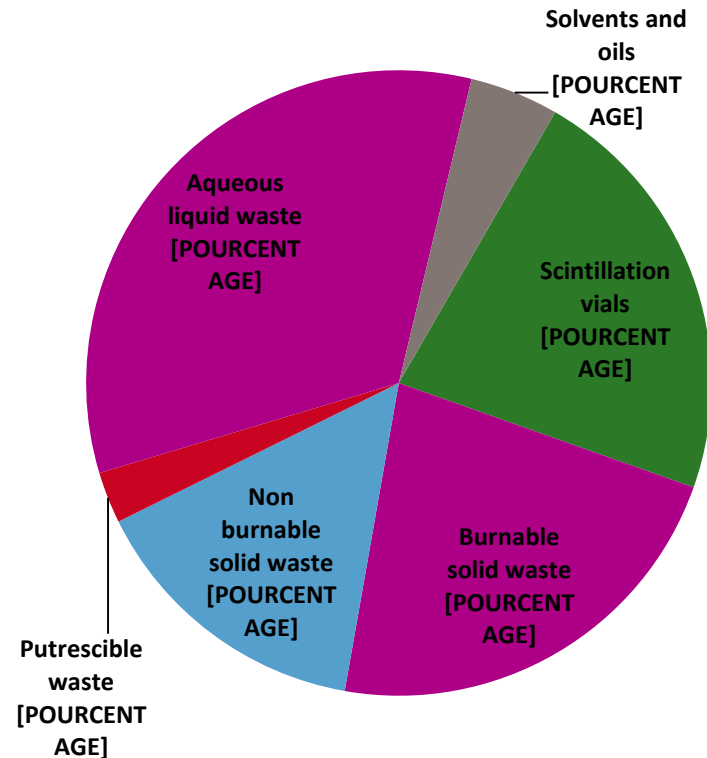
Lightning rods → 2,4 t

Radioactive salts/radium objects → 3,4 t

Smoke detectors → 165 kg

Sealed sources → 470 kg

ORUM → 8 kg



Particular waste: containing chemicals, specific radioelements, liquids... , sometimes biological material

Non electronuclear waste : a large diversity of situations and producers

» A wide spectrum of actors:

- More than 1 800 producers : universities, laboratories, industrials, public and private research organisms, individuals, conventional waste collection organisms ...
 - More than 80% of the volumes are being collected through the health sector : hospitals, private and academic research
- 400 active producers / year
- approx 600 requests treated / year
- In a contexte where the volumes collected from the private research sector are declining
 - Technology changes
 - Globalization

» Figures :

- An average of 0,89 m³ par production site / year
- Less than 10% of the producers represent 50 % of the collected volumes

» A spectrum of services that is wider than that offered to electronuclear producers



Socodei/Centraco
Operating Nuclear facility
Incinération

Andra disposal facility
For I&LLW short lived
(CSA)
Operating Nuclear facility

Industrial centre of regroupment,
storage and disposal of VLLW
(Cires)
Operating classified facility as regard
to the environment

date of opening: 1999
Capacity: 3 500 t solid waste /year maximum and 2 000 tons of liquid waste

date of opening : 13 january 1992
surface : 95 ha including 30 ha of disposal cells
Capacity: 1 million cubic meters of I&LLW-short lived
Operating timescale: ≈ 60 years

date of opening : 14 august 2003
surface : 43 ha including 28,5 ha of disposal cells
Capacité de stockage : 650 000 cubic meters of VLLW
Operating timescale : ≈ 20-25 years

Management route that can benefit from the solutions that have been put in place for the electronuclear branch but dependant on those facilities detained by unique actors, and adapted and dimensioned mainly for electronuclear waste.

- ◆ The Socodei industrial accident in 2011 immobilized the management routes for non electronuclear waste for more than one year.

Need to pre-treat most of the non electronuclear waste, activity of treatment being a key step, that in the past has long been subcontracted to electronuclear branch actors.

Moreover, the non electronuclear sector has intrinsic difficulties :

- ◆ Low volumes (tonnage inferior to 80 tons/ year)
- ◆ Decreasing volumes (-4%/year approx.)
- ◆ Waste is very variable in nature and radiological activity
- ◆ Team turn-over rate is high, and often they aren't specialized in waste management

Need to adress the issues expressed by the producers

- ◆ Need to deal with small fluxes with a wide range of properties and characteristics
- ◆ Waste management solutions are often perceived as a low valued process, far from the heart of their activity, heavy, long, restrictive and expensive

To adress this diagnosis Andra has put in place:

- ◆ A more developed service and advice level than for electronuclear producers (as a response to the mastery degree and level of control of those producers regarding waste management issues)
- ◆ Internal stable and long term solutions to avoid service perturbations
- ◆ Synergy between Andra's different industrial activities allowing to rationalize the logistical chain to better control costs and plannings

Allowing Andra to control its industrial needs regarding treatment operations

- ◆ As soon as 2008, studies have been launched for a new regroupment and storage facility (operational in 2012)
- ◆ In 2011, studies have been launched to internalize key industrial functions of sorting and treating of non electronuclear waste, activities formerly subcontracted (operational in 2016)

Collect and deal with waste coming from non electronuclear activities

Thus, for waste coming from non electronuclear activities, Andra ensures following functions:

Regroupment



Collecting and packages providing

Disposal

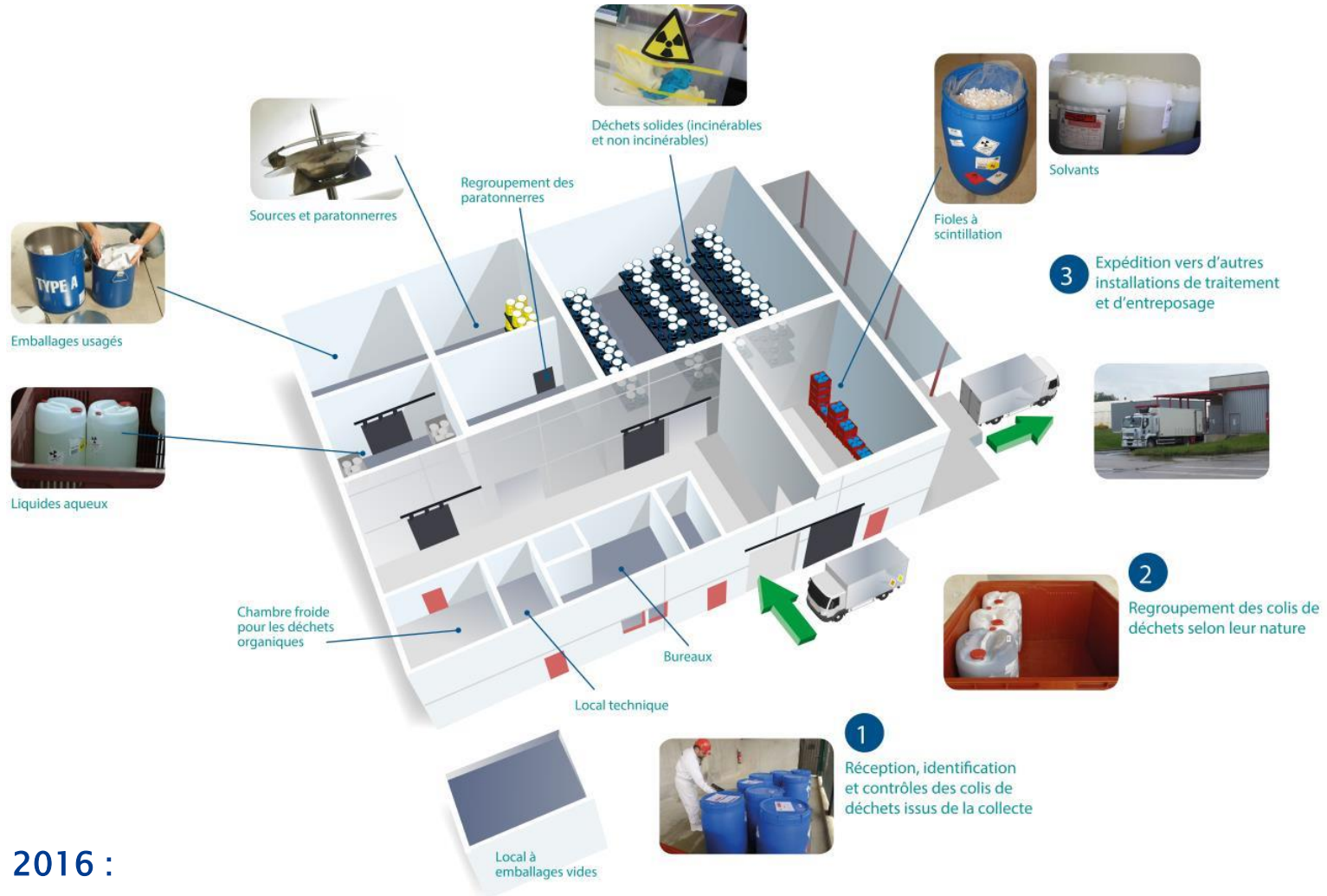


Sorting / Treatment



Storage (for low and intermediate level waste, long lived)





» In 2016 :

- 2 668 collected packages
- 1 590 packages evacuated to treatment storage or disposal facilities

Storage facility (for low and intermediate level waste, long lived)



Objets anciens, tels que réveils



Déchets d'assainissement des sites pollués contaminés au radium ou au thorium



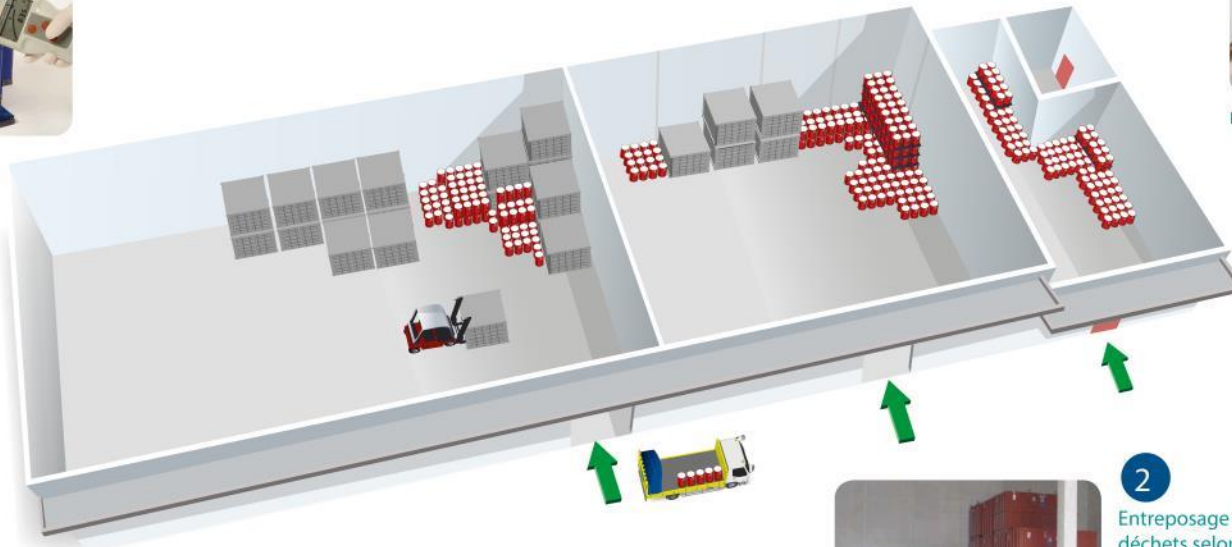
Objets au radium à usage médical, tels que aiguilles au radium



Paratonnerre



Sources scellées, telles que fontaine au radium



1
Réception, identification et contrôles des colis de déchets



2
Entreposage des colis de déchets selon leur propriété radiologique (débit de dose)

» End 2016, 822 m³ radioactive waste packages have been stored, representing 18 % of the volumic capacity authorized for the building (6 000 m³).

A Traitement des fioles de scintillation

- A1 Broyage
- A2 Séparation des matières solides et liquides
- A3 Cimentation des matières solides



B Traitement des déchets liquides

- B1 Tests physico-chimiques sur les mélanges de liquides
- B2 Assemblage des déchets liquides par famille (solvants, huileux, aqueux)



Acheminement des colis depuis le bâtiment regroupement

C Traitement des déchets solides

- C1 Contrôle des colis de déchets solides aux rayons X
- C2 Reconditionnement des colis non conformes



D Démontage des têtes de paratonnerres



- » Operational since 2016
- » Dedicated to small producers waste

- Complex waste (quicksilver and quicksilver contaminated waste, strongly tritiated waste, gaseous waste, special chemical waste, reactive metallic waste)
- Legacy and orphan waste (issue mainly coming from the lack in characterization and knowledge of the contamination history) including activated waste
- Sealed sources
 - » Recovery by provider or manufacturer



CERN (the European Organization for Nuclear Research) was founded in 1954 in order to

- » promote the european scientific collaboration
- » Ensure collaboration between european member states regarding fundamental research in particle physics
- » Provide the scientific community with a laboratory specialized in particle accelerators

Storage of waste in a building that formerly hosted an accelerator

- » Large amount of waste (superior to 7000 m³)
- » Wide diversity of waste
- » Electro-magnets, electrical wires, metallic waste, technological waste, concrete blocks, etc.

Waste management routes :

- » Free release (CH), VLLW, I&LLW-short lived

