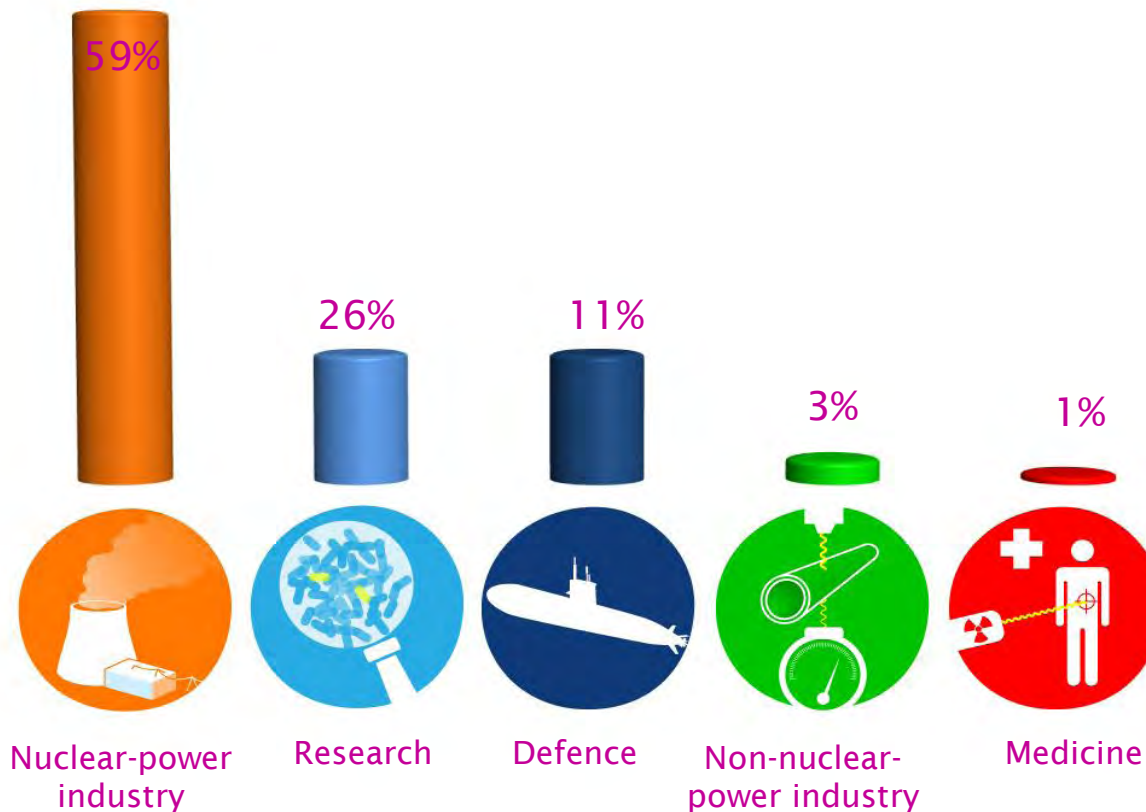




Welcome to the Andra's Aube disposal facilities

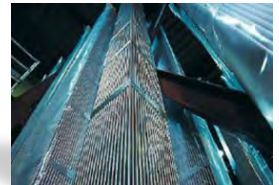
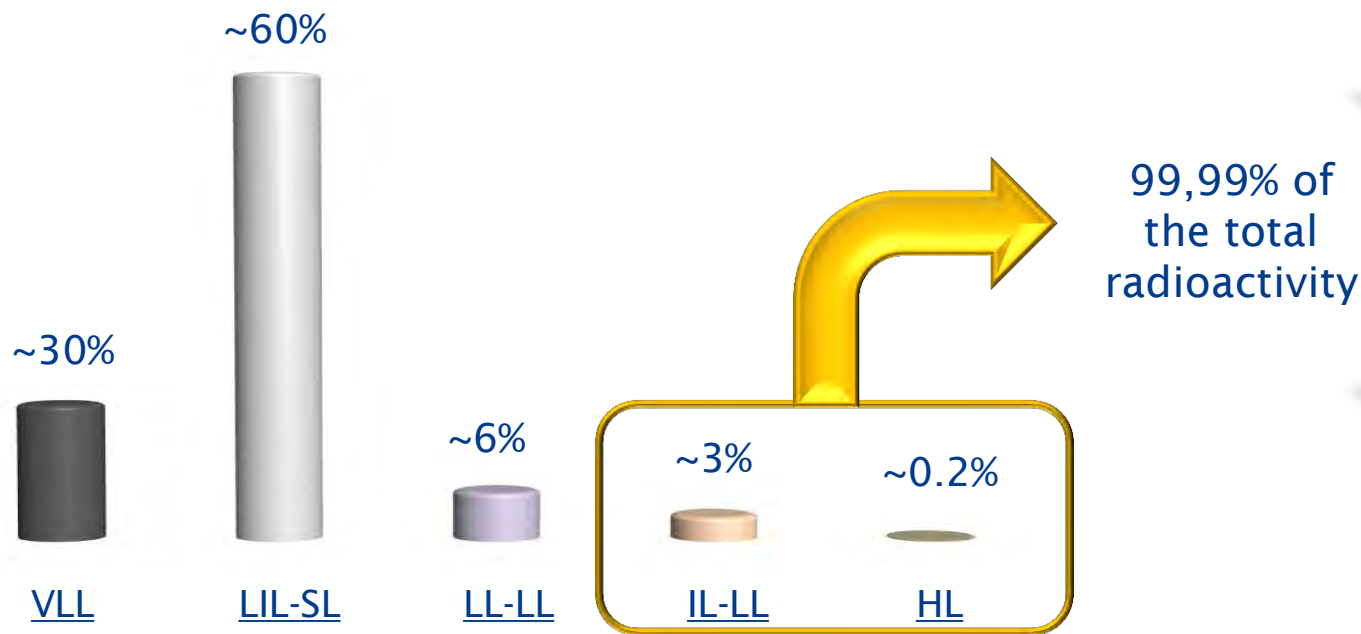
16/11/2015

Radioactive waste emits radiation that may be harmful to human beings and their environment



Waste distribution

- ◆ Distribution of the total volume (1,460,000 m³) of radioactive waste produced in France, per waste type (2013).



(Source : National inventory 2015)

Public industrial and commercial establishment (EPIC) with a staff of 650 employees (in 2014)

Andra's mission is to implement long-term management solutions for every waste category.



Under the supervision of the Ministries for Energy, the Environment and Research

Independent from waste producers

◆◆ To operate and to monitor existing disposal facilities



Manche disposal facility
(CSM)

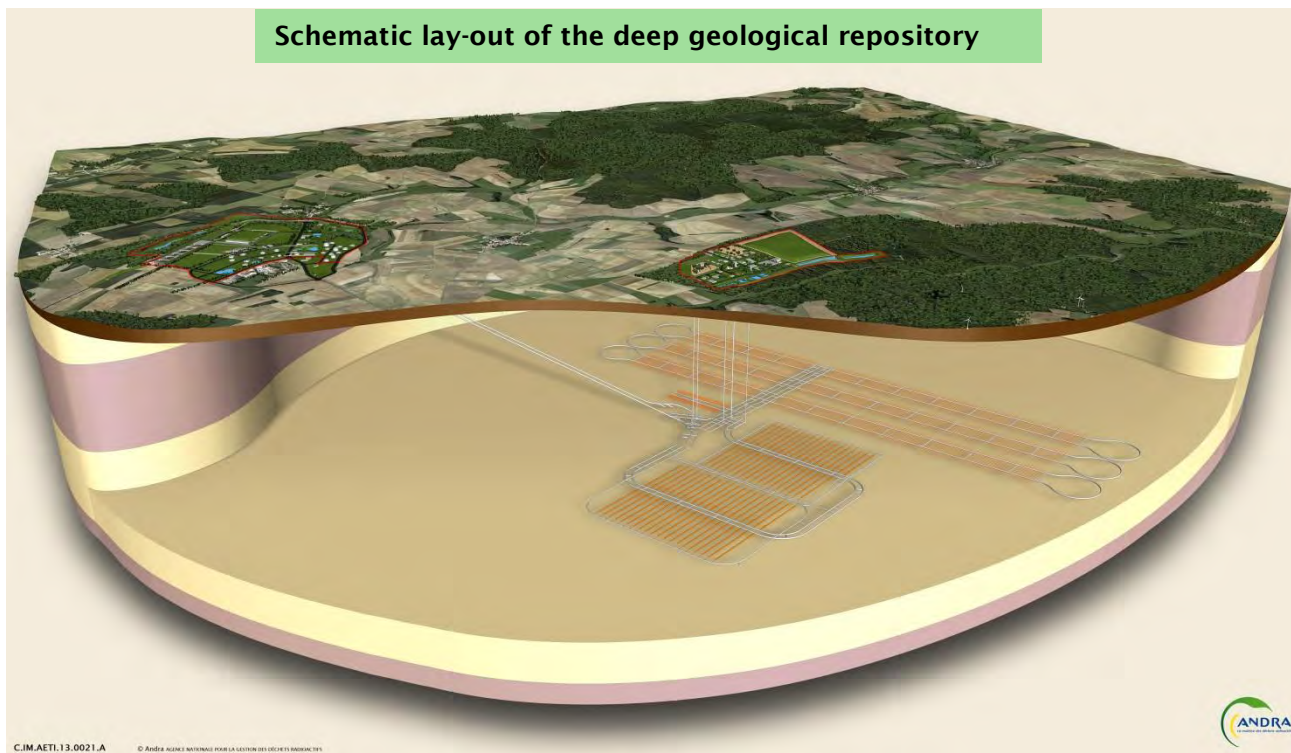


Aube disposal facility (CSA)



Industrial facility for grouping,
storage and disposal (Cires)

- ◆ To study and to design disposal facilities for waste categories pending a management system



- ◆◆ Helping private individuals and taking over radioactive waste resulting from non-nuclear-power sources



Andra's activities : 4) Cleaning up sites

- ◆ Rehabilitating former sites contaminated by radioactivity (Orflam Site, Bayard Plant, etc.), including a possible financing if needed



◆ A National Radioactive Waste Inventory per management system



◆ Contributing to the dissemination of the scientific culture



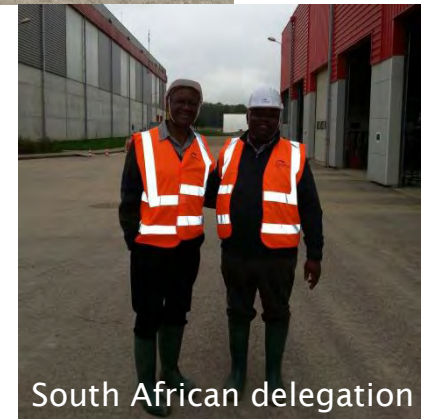
3,000 visitors in 2014 on Aube industrial facilities

Andra's activities: 7) Disseminating its know-out abroad

- ◆ Organize international demonstrations (colloquium, conferences, etc.)
- ◆ Welcome foreign delegations on its sites (visits, meetings, etc.)
- ◆ Participate in the activities of international authorities
- ◆ Produce advice and expertise for the projects abroad



Vietnamese delegation



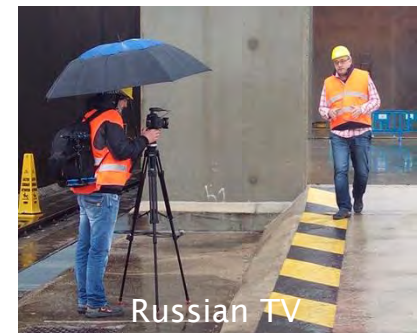
South African delegation



Israeli delegation



British Safety Authority



Russian TV



Aube disposal facility (CSA) for low-and intermediate-level short-lived waste

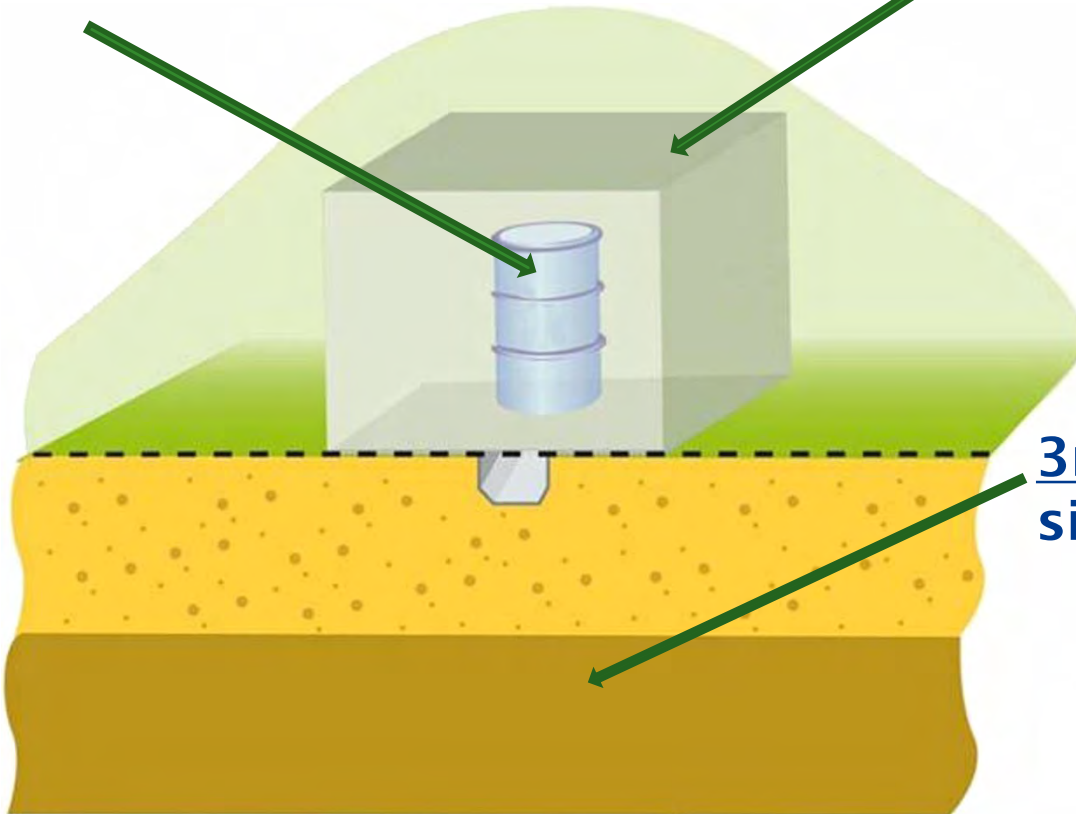


◆ Three barriers to isolate radioactive waste from the environment

1st barrier : the package

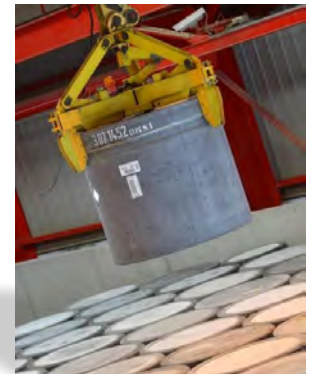
2nd barrier : the disposal cell and the future cap

3rd barrier (natural): the site - geology



CSA : A few figures for 2014

- ◆ Disposed volume : 11,803 m³
- ◆ Number of disposed packages : 10,704
- ◆ Number of compacted drums : 15,833
- ◆ Number of injected boxes : 572



Since 1992

- Disposed volume: 29,2 % of authorized volume
- Number of disposed packages: 387,107
- Number of closed cells: 127

Statutory plan approved by the French nuclear safety authority (ASN)

◆ **Radiological monitoring**

- Nearly 12,000 analyses of surface waters (rivers, streams) and groundwater, air, sediments, food chain, vegetation, milk...
- Reference point : ecological and radiation state in 87/88 and 99/01

◆ **Non-radiological monitoring**

- Chemical and physicochemical analyses of water, ecology, noise and vibrations...

◆ **Monitoring of the ecology of the various surrounding environment**

Results show a very low impact on the environment (more of 100,000 times lower of the statutory limit)



The CSA environmental monitoring plan

- ◆ Results transmitted to : ASN (French nuclear safety authority), IRSN (radioprotection and nuclear safety Institute) and the national measurement network (www.mesure-radioactivite.fr)
- ◆ Annual meeting of the Cli (local information commission) on environmental monitoring
- ◆ Main results published in the Internet and annual report

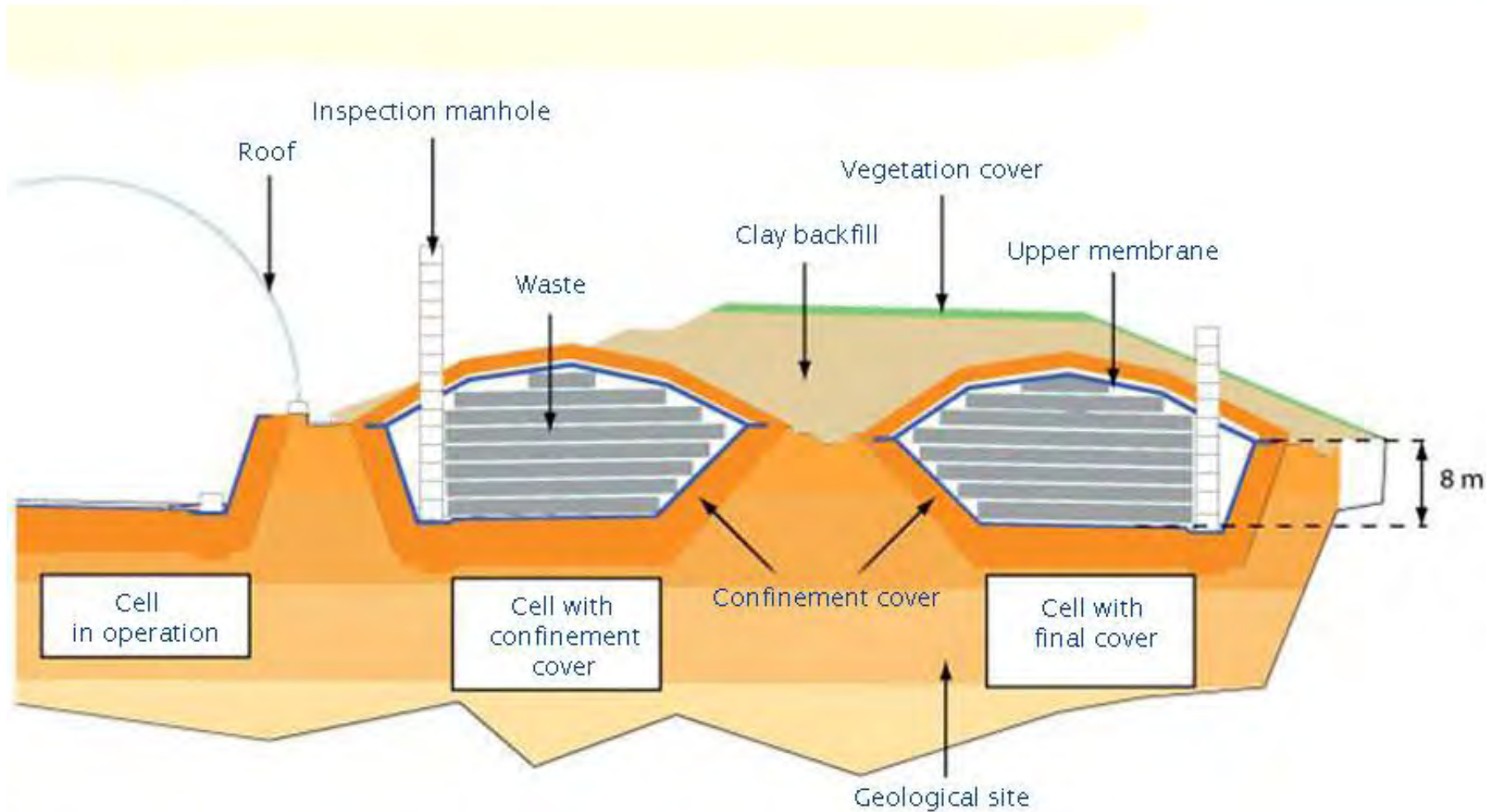




Industrial facility for grouping, storage and disposal (Cires)

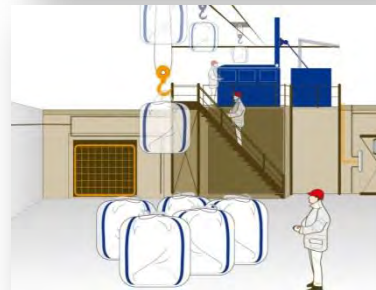


Concept for very low level radioactive waste disposal



Cires : A few figures for 2014 for very low level radioactive waste disposal

- ◆ Disposed volume : 27,112 m³
- ◆ Number of disposed packages : 36,153
- ◆ Waste compacted in the scrapbaling press (plastic) : 2,283 m³
 - (rate of reduction : 2,92)
- ◆ Waste compacted in a packing press (light scrap metal) : 720 m³
 - (rate of reduction : 5,65)



Since 2003

- Disposed volume: 42,9 % of authorized volume
- Number of disposed packages: 341, 937
- Number of closed cells: 14

Non-nuclear-power radioactive waste coming from :

- ◆ Hospitals, research centres...
- ◆ Polluted sites

And old radioactive objects.

Most of this waste is destined to be disposal off CSA or Cires. One small part of it still has no disposal facility (LL-LL, IL-LL) and it is stored in Cires.



Radium-water dispenser



Radioluminescent clocks



Box for radium needles



Lightning conductor



Radium-bearing waste

Grouping building (550 m²) :

- ◆ Reception of waste
- ◆ Temporary storage of waste packages
- ◆ Conditioning of certain waste packages
- ◆ Expedition of waste towards installations of elimination (incineration) or treatment (compaction) before directing this waste to the disposal or the storage
- ◆ Management of empty packages coming from the collect



Storage building (2,000 m²) :

- ◆ For non-nuclear-power radioactive waste any disposal solution for now.



Prefectural order defines the environmental monitoring plan

Radiological and physicochemical monitoring of :

- ◆ Groundwater, on-site surface water (storm basin water, runoff water), off-site runoff water
- ◆ Sediments
- ◆ Atmospheric discharges
- ◆ Dosimetry at the facility fence line
- ◆ Lixiviation water (water possibly found at the bottom of cells)

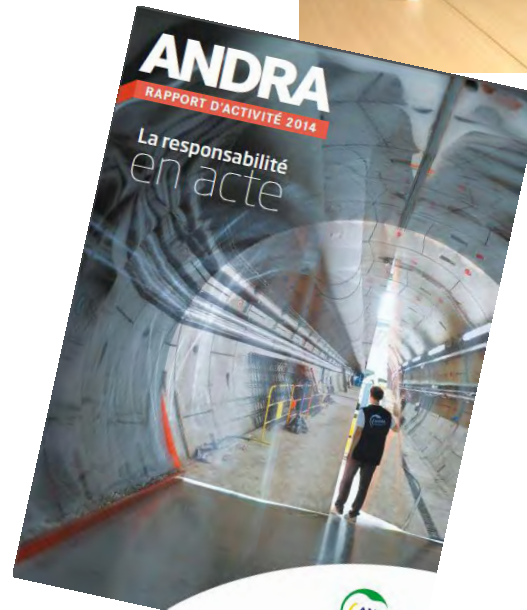
More than 1,500 radiological analyses per year

Results show no radiological impact on the environment.



◆ Communication of main results :

- CSS (monitoring commission for the site)
- Annual report
- www.andra.fr
- www.mesure-radioactivite.fr
-





Thank you for your attention



Links

Inventory : very-low-level (VLL) waste

- ◆◆ Dismantling of nuclear facilities or conventional industries
- ◆◆ Nature : rubble, concrete, scraps metal, etc.
- ◆◆ Conditioning : big bags, drums, etc.
- ◆◆ Surface disposal : Cires



Inventory : Low- and intermediate-level short-lived (LIL-SL) waste

- ◆◆ Maintenance and operation of nuclear facilities
- ◆◆ Nature : clothing, gloves, tools, filters, chemistry glassware, etc.
- ◆◆ Conditioning : concrete or metal containers
- ◆◆ Surface disposal : CSA in reinforced concrete cells



Inventory : Low-level long-lived (LL-LL) waste

- ◆ Radium-bearing (treatment of the various minerals)
- ◆ Graphite : dismantling of the first generation nuclear reactors.
- ◆ Other types of waste : lightning conductor, fire site detectors, luminous paints (in clock manufacturing)
- ◆ Storage : most of the time on its production site while waiting for the creation of an adapted disposal facility.



Rare earths



Graphite sleeve



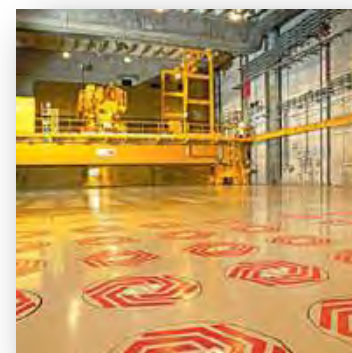
Lightning conductor

- ◆ From electronuclear industry
- ◆ Nature : cladding and structures surrounding the spent fuel or operational residues from nuclear facilities.
- ◆ Conditioning : compacted « waffles » in stainless-steel drum
- ◆ Storage : on its production or conditioning site while waiting for the creation of an adapted disposal facility : Cigeo project. Commissioning of the disposal facility planed for 2025.



Inventory : High-level (HL) waste

- ◆ **Nature** : elements resulting from spent-fuel recycling and without any further use (considered as ultimate waste)
- ◆ **Conditioning** : vitrified waste in stainless-steel drums
- ◆ **Storage** : on its production or conditioning site while waiting for the creation of an adapted disposal facility: Cigeo project. Commissioning of the disposal facility planed for 2025.





Disposal cells



Underground monitoring network



Geological model of the site

