

A unique array of skills and services

Relying on its wide-ranging competences in the field of waste management and disposal, Andra offers multiple solutions, from consultancy and document review, to technology transfer and turnkey projects - to all countries and organizations concerned by the safety and the efficiency of their radwaste management

Waste management policies

- › Development of framework for radioactive waste management
- › Waste management organization implementation

Waste management strategies

- › National strategy and waste management plans
- › National, corporate & site waste inventories
- › Waste characterization and tracking
- › Waste compliance verification
- › Data archiving and site memory

Communication & public relations

- › Stakeholder engagement and communication strategy
- › Communications resources: web, edition, video, public debates and consultations

Research and Development

- › Geology, geophysics, rock mechanics, geochemistry, sensors & networks...
- › R&D program design & management

Training

- › Specific or generic waste management courses
- › Training program design
- › Extensive use of Andra facilities and R&D resources

Site remediation

- › Site characterization
- › Site clean-up
- › Waste management

Disposal facility design: VLLW, LLW, ILW, HLW & Spent Fuel

- › Conceptual to detailed design : waste treatment, conditioning and disposal
- › Siting of facilities: early bibliographical studies to site characterization management
- › Safety analysis: modeling, simulation, studies

Disposal facility licensing

- › Environmental and safety reviews
- › Site and waste disposal licence preparation

Disposal facility construction

- › Construction management
- › Project owner support

Disposal facility operation

- › Waste treatment and packaging facilities design
- › Operations and quality reviews and improvements assessment

Disposal facility closure

- › Site closure planning
- › Safety reviews
- › Final site capping design

"Small scale nuclear activities" waste producers

- › Collection, sorting, treatment, packaging and disposal of radioactive waste
- › Environmental monitoring

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Andra

The French National Radioactive Waste Management Agency

- Over 40 years of experience
- Disposal solutions suitable / adapted for all types of radioactive waste

Andra's solutions and experience

For more than 40 years Andra has been responsible for managing all radioactive waste generated in France, mainly by nuclear installations like reactors and nuclear-related facilities.

Andra has developed and demonstrated various concepts and methodologies for a large variety of waste categories, notably for low- and intermediate-level short-lived (LL/IL-SL) and very-low-level (VLL) waste.

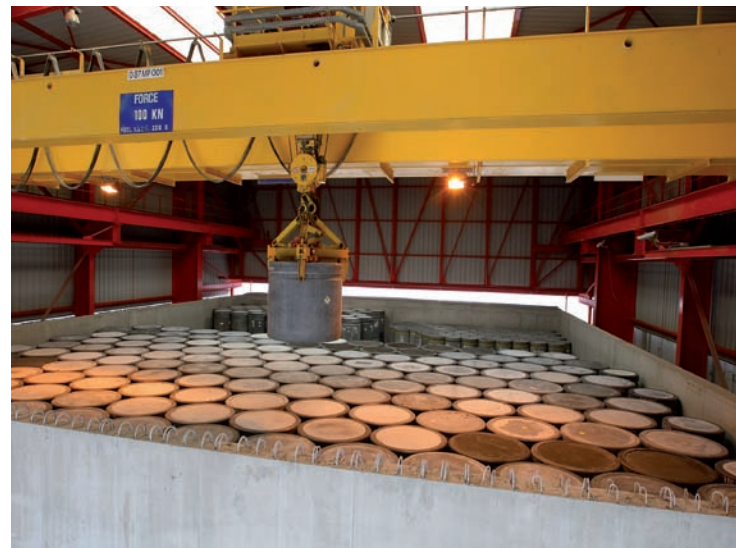
These concepts are flexible enough to accommodate new waste types and forms throughout the operation of disposal facilities.



Waste resulting from the maintenance and dismantling of nuclear facilities

Andra has already successfully addressed with a large number of dismantling issues, such as:

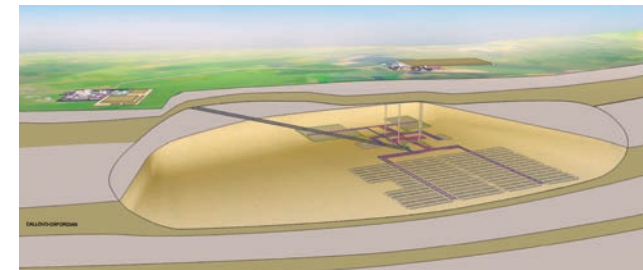
- › Identification of a quantitative and radiological inventory of VLL dismantling waste, followed by the design and operation of adapted disposal facilities for VLL waste (CIRES) and for low- and intermediate-level (LIL) waste (CSA), both located in the Aube district;
- › Dealing with large components as PWR vessel-heads and steam-generators respectively disposed of at the CSA (LIL-SLW facility) and the CIRES (VLLW facility), following the analysis of various options.



Placing a concrete package in a disposal cell

Geological disposal - Cigéo Project

- › Andra has over 20 years of experience in the preparation of projects for the implementation of a repository for HL and IL-LL waste. Since the late 1990s, it has been carrying out surveys notably through Meuse/Haute-Marne Underground Research Laboratory (URL). The results of the research program were published in the Dossier 2005 in which Andra demonstrated the basic feasibility of deep geological disposal for HL and IL-LL waste and SF, in case if it is required in the future by the French policy that would be consistent with a reversibility rationale.
- › The Dossier 2005 was followed by an updated version, Dossier 2009, that included further steps towards siting, by selecting a restricted 30-km² area. The Cigéo (industrial center for geological disposal) facility project has entered in its licensing process in 2013 with a national public debate.



The license to build the repository is expected by 2019 with a commissioning process launched by 2025.

- › Andra has demonstrated its ability to design and to lead the required scientific R&D program to justify its proposed options and to demonstrate the safety of its solutions, thus ensuring a high added value to its projects. In addition, it also develops various construction and handling methods and processes; the corresponding demonstrators and pilot models that were built and tested by Andra, are now displayed at its Technological Exhibition Centre.
- › The Research Program carried out in preparation for the implementation of disposal facilities relies on a detailed knowledge of the waste and of the sites involved, and uses an iterative design method. The performance of the disposal facility and the safety it provides is constantly re-assessed via a series of methods developed by Andra and aim at integrating both the existing knowledge and system analysis.
- › For example, the Agency has developed a methodology for the phenomenological analysis of repository situations in order to describe and to analyse any phenomenon likely to occur throughout the evolution of the repository.

Deep geological disposal concept

NORM & TENORM waste

- › In its radwaste management organization, the Agency has accumulated more than 15 years of experience in compiling inventories (notably prospective) and characterizing radioactive waste generated by nuclear power sector but also by the chemical industry and other industrial applications of radioactivity.
- › Andra has also developed disposal solution concepts and methodologies for VLL and “low-level long-lived” LL-LL residues (such as NORM & TENORM radium-bearing waste resulting from industrial activities), as well as residues occupying substantial volumes.

Radioactive waste management

Andra's competencies include:

- › Radioactive waste management policies
- › Radioactive waste management strategies: inventories, management plans
- › Training
- › Communication & public relations
- › Management of radioactive waste originating from “small scale nuclear activities” (medical, chemical industry, etc.)
- › Environmental monitoring



Radioactive lightning conductor head