

MANAGING RADIOACTIVE WASTE
AND MAKING IT SAFE FOR FUTURE GENERATIONS

Activity Report 2019



Editorial	03
Andra's mission	04
Our teams in 2019	05
Organisation chart	06



Preparing for Cigeo

Preparing the Cigeo construction licence application	09
Finalising the application for the Declaration of Public Utility (DUP)	10
Regional Development Project (PDT)	11
Works in the region	12
Consultation	13



Scientific & Technical Knowledge

Underground Research Laboratory	21
Innovation	22
European Projects	23
Partnerships	23

07 National Radioactive Materials and Waste Management Plan (PNGMDR)



Industrial Activities

15 Customer Relations
16 Andra's Aube Industrial Facilities
19 Manche Disposal Facility



Openness to Society and the World

25 Memory
26 Information and Dialogue
27 International

Editorial

2019 will have been a pivotal year for Andra, with important project deadlines approaching, such as the application for the Declaration of Public Utility (DUP) and the Construction Licence Application for the Cigeo project. Andra also swung into action to undertake the final phase of preparing this regulatory documentation in the best conditions. In the longer term, the whole Agency will be transformed, particularly in anticipation of Cigeo construction, if the project is approved. A change that is beginning today, both culturally and in terms of organisation.

Radioactive waste management is a long-term commitment. Our ability to complete this task lies particularly in our ability to adapt, to remain agile in order to meet the demands and expectations of the **authorities, assessors, radioactive waste producers and civil society**. And to do so without ever making concessions on the safety of our repositories, an inviolable principle that guides us in all our activities and projects.

Adapting to the requests of the authorities. A major project like Cigeo entails a large number of regulatory procedures. More than a hundred are to be completed in the coming years. One of the most structuring is the DUP, for which discussions have been held with the relevant authorities since the end of 2019 to prepare the application. Andra has thus implemented a specific organisational structure to rationalise the production of the required documentation.

Fulfilling requests and commitments made to the Nuclear Safety Authority (ASN), in particular through the Cigeo construction licence application, which should be finalised towards the end of 2020. To this end, the detailed engineering design studies were completed in 2019, incorporating in particular feedback from the ASN on the project's Safety Options Report. In 2019, Andra also submitted the ten-year safety review file for the Manche disposal facility (CSM). Discussions will now be held with the ASN and the Institute for Radiological Protection and Nuclear Safety (IRSN) as part of its assessment. Now in the post-closure phase, the CSM, which celebrated its 50th anniversary in 2019, reflects our commitment over the long term: it is a pioneering site from

which many lessons have been learned and it forms part of a process of continuous improvement.

Remaining agile faced with the requests of waste producers. Some waste packages, although only a small number of them, do not fall under the authorisation procedures for them to be managed at the Aube industrial facilities. This was the case for several large packages received in 2019.

A specific authorisation procedure, specially adapted equipment, a dedicated disposal solution: the facilities adjust to meet the needs of waste producers, but always with the same safety requirement. Moreover, the encouraging results of our annual survey of producers and the positive ASN annual report demonstrate recognition for an organisation that works well and the maturity of our dialogue with producers.

And, finally, meeting society's expectations. Reaching decisions in conjunction with society wherever possible, particularly on the Cigeo project, is essential. As such, in 2019, the expectations and concerns of stakeholders in the region were taken into account on certain subjects open to consultation, such as energy or spatial planning and quality of life.

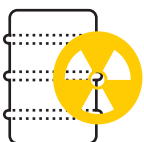


PIERRE-MARIE ABADIE,
CEO OF ANDRA

Andra also draws its expertise from its ability to listen to the wishes expressed by society as a whole and incorporate them into its plans. It is not conceivable to move forward alone on such a complex matter that will necessarily involve future generations. Scientific partnerships, European projects, innovative projects with actors outside the nuclear sector, dialogue with international bodies and our counterparts abroad... 2019 was a time for discussion and mutual enrichment. Two terms that could also summarise our views on an important moment that punctuated 2019: the public debate on the French National Radioactive Materials and Waste Management Plan (PNGMDR). Over several months, it provided exchanges with citizens and stakeholders to inform the future decisions of the authorities. We take from it a shared desire to further discussions on the ethical and societal aspects of waste management. Once again, our agility and collective approach will enable us to move forward with this in mind, as we did throughout 2019. —

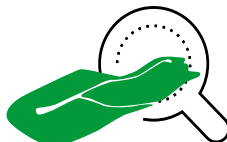
Andra's mission

Andra works with commitment and responsibility to fulfil the activities in the general interest entrusted to it by the State on behalf of French people: managing the radioactive waste produced by current and previous generations and making that waste safe for future generations.



Operating

the two existing surface disposal facilities in the Aube: the Aube disposal facility (CSA) for low- and intermediate-level short-lived waste (LILW-SL), and the Industrial facility for grouping, storage and disposal (Cires) for very low-level waste (VLLW).



Monitoring

the Manche disposal facility (CSM), France's first surface disposal facility for low- and intermediate-level radioactive waste, now closed.

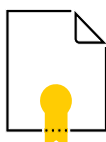


Researching and developing disposal solutions for waste currently lacking a disposal facility, namely:

- low-level long-lived waste (LLW-LL);
- high-level waste (HLW) and intermediate-level long-lived waste (ILW-LL): the Cigeo project.



Informing and promoting dialogue with all sectors of the public



Fulfilling

a public service mission to:

- collect old radioactive objects owned by private individuals (luminous clocks, radium-bearing items for medical use, natural salts for laboratory work, certain minerals, etc.);
- clean up legacy sites contaminated by radioactivity;
- produce the *National Inventory of Radioactive Materials and Waste* in France every three years. The latest edition was published in 2018.



Preserving the memory of disposal facilities



Sharing and promoting Andra's expertise worldwide

Our teams in 2019

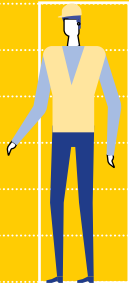
Staff numbers (on 31/12)

649

employees

(64 new employees and 18 work-study trainees)

Men
60%



Women
40%



Engineers and managers
70%



Others*
30%



*Workers, employees, technicians and supervisors.

Staff numbers per site

MANCHE
Disposal Facility

6

CHÂTENAY-MALABRY
(headquarters)

404

Andra's AUBE
industrial facilities

86

Andra's MEUSE/
HAUTE-MARNE Centre

153



Just like the approach initiated in 2017, 2019 saw a speeding up of the dynamic to transform Andra. Some of the notable changes included a unanimous and innovative agreement on remote working, the launch of a human resources management system, and the approach to exploring human capital, named D2LTA. We also enhanced our approach to Corporate Social Responsibility (CSR), now part of the scope of the Human Resources Division, by focusing our action on the quality of work life and interpersonal relationships (joint construction, open days for children, cleaning days, etc.).

Fabrice Puyade,
Human Resources Director

Finances in 2019

Budget implementation:

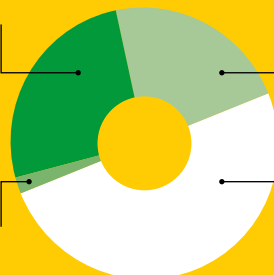
€284m

The Cigeo project is financed by the three main players in the nuclear power sector (EDF, CEA and Orano) through a tax allocated to research and a special contribution for the facility design studies and preparatory work.

Funding of activities

Commercial
contracts
26%

Public
subsidy
2%



Research
tax
22%

Special
contribution
50%

Local procurement in 2019

More than 20 million euros

worth of orders placed with local businesses in Meuse, Haute-Marne, Aube and La Manche

Organisation chart

On 01/06/2020



**Pierre-Marie
Abadie**

Chief Executive Officer



**Sébastien
Crombez**

Safety, Environment
and Waste Management
Strategy Director



Sébastien Farin

Foresight, Public Involvement
and International Affairs
Director



**Frédéric
Launeau**

Cigeo Project Director



Marc Leguil

Engineering Director



David Mazoyer

Director of the
Meuse/Haute-Marne
Centre



Frédéric Plas

Research and
Development Director



Fabrice Puyade

Human Resources
Director



Gaëlle Saquet

Corporate Secretary



Patrice Torres

Industrial Operations
Director and
Director of Andra's Aube
Industrial Facilities



APPOINTMENT

Adolphe Colrat, new Chairman of Andra's Governing Board

In May 2019, Adolphe Colrat, Prefect and Inspector-General for Finance, was appointed Chairman of Andra's

Governing Board by Presidential Decree. A graduate of the École Normale Supérieure, holding an *agrégation* in Classical Studies, the Paris Institute of Political Studies and a former student at the École Nationale d'Administration, he has held various positions as a prefect throughout his career (Alpes-Maritimes, Manche, Meurthe-et-Moselle and Ardennes).



A public debate on the PNGMDR

As part of the preparation of the 5th National Radioactive Materials and Waste Management Plan (PNGMDR), a public debate was organised by the French National Public Debate Commission (CNDP) between April and September 2019. The objective was to inform citizens and provide them with the opportunity to discuss with the stakeholders involved in the subject (project owners, operators, associations, elected representatives, etc.), as well as to ensure that these exchanges with the public inform the future decisions of the authorities responsible for drafting the Plan (ASN* and DGEC**). This was the first time a public debate was held before an issue of the PNGMDR was published since its creation in 2006. As a management tool, every three years, the PNGMDR reviews the existing methods of managing radioactive materials and waste, identifies the needs for disposal and storage facilities, and sets out the strategic directions for the duration of the Plan.

Andra, participant in the public debate

For Andra, the stakes of this debate, of different kinds, all called for collective reflection: on the Industrial Centre

for Geological Disposal (Cigeo) project, on the management of low-level long-lived radioactive waste (LLW-LL), as well as on the management of very low-level waste (VLLW) in view of the upcoming dismantling of nuclear installations. Andra got involved in the discussions by participating in the preparatory work, in the debate meetings and by publishing a contribution¹ and four position papers².

An incentive to further the discussion

In November 2019, the CNDP and the Special Public Debate Commission (CPDP) on the PNGMDR drew up a report of the five months of discussions. This helped to clarify the various challenges of the Plan, in particular the question of whether or not to reclassify certain radioactive materials as waste, the clearance level of VLLW, the definition of one or more LLW-LL waste management solutions and the milestones of the Cigeo project. The discussions also brought three cross-cutting issues often raised by the public to the fore: ethics, governance, and trust. Finally, the debate further encourages Andra to pursue the approach to openness and dialogue with society that it has engaged in for many years. —

* Nuclear Safety Authority

** Directorate-General for Energy and Climate

¹ <https://bit.ly/3d930o5>.

² <https://bit.ly/3emSVUL>.



The public debate on the PNGMDR provided an opportunity for Andra to engage in discussion with and inform the public on topics at the crossroads between technical, societal, environmental and ethical issues, while keeping in mind the requirement of very long-term management.

Julie Quantel,
Head of Consultation
and Openness to Society

FOCUS ON

Publication of Essentials 2019

Andra published a new edition of the Essentials of the *National Inventory of Radioactive Materials and Waste* in March 2019. Updated each year, this document presents the changes to the volumes of radioactive materials and waste in France and represents a valuable tool for guiding the materials and waste management policy.



All of the data from the *Inventory* can be consulted at: inventaire.andra.fr

Report submitted on LLW-LL disposal



In 2019, we submitted a report on the preliminary safety requirements and issues for the disposal of low-level long-lived waste (LLW-LL). The document reviews all of the R&D studies and the work that has been completed since 2015. It also presents a new roadmap for defining various management scenarios for LLW-LL.

Virginia Wasselin,
Waste Management Strategy
and LLW-LL Department Head

01

Preparing for Cigeo

AND OPERATIONS IN MEUSE/HAUTE-MARNE

09 Preparing the Cigeo construction licence application

10 Finalising the application for the Declaration of Public Utility (DUP)

11 Regional Development Project (PDT)

12 Works in the region

13 Consultation

Cigeo is the French project to build a deep geological repository for the disposal of radioactive waste, located at the border of the Meuse and Haute-Marne départements. It is designed to dispose of the most highly radioactive waste with the longest half-life in order to protect humans and the environment from the very long-term hazards that it presents.

The result of a long scientific journey fuelled by 25 years of research and a democratic process punctuated by two public debates and three laws, geological disposal is the subject of international consensus and meets the ethical imperative of not passing the burden of managing the most hazardous radioactive waste on to future generations.

PREPARING THE CIGEO CONSTRUCTION LICENCE APPLICATION

Detailed engineering design phase completed

After several years of design studies, 2019 saw the completion of the detailed engineering design phase for Cigeo. In comparison to the basic engineering design phase, the detailed configuration of Cigeo incorporates several technical and economic optimisation measures provided by Andra in order to rationalise the overall cost of the project, while maintaining the highest level of safety and enhancing safety for operators: a reduction in the volume and footprint of the building used for receiving, inspecting

and preparing waste packages; the development and simplification of the network of disposal cells, making the direct disposal of certain packages of intermediate-level long-lived waste (ILW-LL) possible; mechanised excavation using a tunnel boring machine, etc.

ASN opinion on the safety options

The additional information requested by the Nuclear Safety Authority (ASN) in January 2018 following its assessment of the Safety Options Report in early 2016 was also incorporated. In particular, additional evidence had been requested concerning the repository architecture, the design of the facility to withstand natural

hazards, as well as the provisions for monitoring it and for managing post-accident situations. The ASN had also expressed a reservation on the disposal of bituminised waste packages as they are, given the uncertainties about their physical, chemical and thermal behaviour. At the time, Andra and the radioactive waste producers initiated new studies based on two options: firstly, neutralising the chemical reactivity of bituminised waste before it is sent to Cigeo; secondly, reinforcing the disposal provisions for bituminised waste packages to control the risk of runaway exothermic reactions and to prevent this runaway from spreading between packages. —



The completion of the detailed engineering design studies for Cigeo marks the beginning of a new stage: the drafting of the construction licence application, which is expected to be completed by Andra towards the end of 2020.

Thierry Lassabatère,
Deputy Director of the Cigeo Project
Technical Supervision Unit

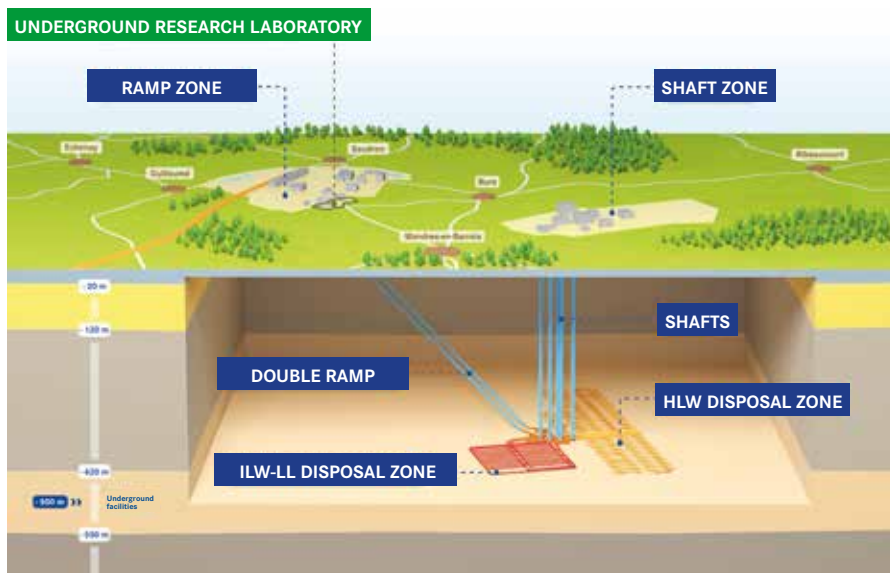
FOCUS ON

A group of experts gives its opinion on bituminised waste packages

The review initiated in 2018 by the ASN and the Ministry for Ecological and Inclusive Transition on the management of bituminised waste packages with a view to their disposal in Cigeo produced its report in September 2019. Over several months, the experts assessed the scientific knowledge regarding this waste and the relevance of the additional studies carried out by Andra and waste producers (see article). With regard to Andra, the experts in the review consider that the studies should in the short term result in a design of Cigeo for which safety can be demonstrated convincingly.



The Cigeo project



FINALISING THE APPLICATION FOR THE DECLARATION OF PUBLIC UTILITY

Final phase of preparation of the public inquiry file

A major milestone in the progress of the Cigeo project was reached at the end of 2019 when Andra drew up the public inquiry file prior to the declaration of public utility of the Cigeo disposal facility project. The drafting of this file involved holding talks with government departments. It will be submitted officially in 2020 and then made available to the public in the form of a public inquiry. At the end of the enquiry, the declaration of public utility may be issued in a decree by the Prime Minister after consulting the Council of State.

An essential milestone

The purpose of the declaration of public utility is to reaffirm the general interest of a project and the State's political support for the areas where it will be based. It also paves the way for several licence applications. In the case of Cigeo, these concern



the preparatory works necessary for constructing the repository (rescue archaeology works, construction of road, rail, electricity and water networks, etc.), as well as the purchase of the land required to site the facility, should amicable negotiations, always favoured by Andra, fail.

A key document

In addition to a general presentation of the Cigeo project, the public inquiry file contains the characteristics of the disposal facility, any legal and administrative documents, and documentation relating to the consultation, economics, town planning and the region, as well as an impact

study for the overall Cigeo project*. The centrepiece of the file, this study presents the current state of the environment, the expected impact of the project on the environment (atmosphere, soil, subsoil, water, natural environment, etc.), on health and the development of the region, as well as the measures planned by Andra to prevent, limit and offset these effects. —



The submission of the public inquiry file is the culmination of several years of work by Andra and its partners. It consists of 17 sections covering everything from the justification of choices related to disposal to more technical documents.

Sandrine Chotard,
Regulatory Documentation
Coordinator



* That is, taking into account – in addition to the disposal facility – any work required for its operation and performed by other project owners (power supply, water supply, upgrading of railway line 027000, rerouting of department road 60/960).



BEHIND THE SCENES

A student builds a model radioactive waste transfer cart

In July 2019, Andra supported a student taking preparatory classes for admission to the *Grandes Écoles* (top engineering schools) in carrying out an original project: producing a small-scale moving model of a transfer cart for radioactive waste packages. A device that is expected to be built within the next ten years as part of the Cigeo project. Composed of 500 building blocks and equipped with sensors and two motors, the model is approximately 50 cm long, or 1/20 of the actual size of the cart. It has now joined the major demonstrators in the Technological Exhibition Facility, open to the public, in Andra's Meuse/Haute-Marne Centre.

REGIONAL DEVELOPMENT PROJECT (PDT)

PDT signed to anticipate the needs of tomorrow

Creating a setting conducive to the success of the Cigeo project, to the economic momentum of its host community and to the quality of life of its residents: this is the ambition of the Regional Development Project (PDT) signed in October 2019 during a meeting of the Cigeo high-level committee at Andra's Meuse/Haute-Marne Centre. A true roadmap, this strategic document involves the State, local authorities, industry and institutional stakeholders in the region in as many as 64 projects.

Initiatives from 2020

More than half of the projects that are being formalised concern infra-

structure developments prior to the construction of Cigeo (road and rail networks, drinking water supply, etc.) and socio-economic support initiatives (creation of business parks to accommodate companies, development of skilled jobs, housing renovation, creation of amenities and services for the local population, etc.). They will be carried out from 2020 involving a budget of more than €500 million. Other actions, for which the scope is yet to be clarified and confirmed, are also planned in the longer term to enhance the attractiveness of the region through structural development measures and create the conditions for economic and environmental excellence. —



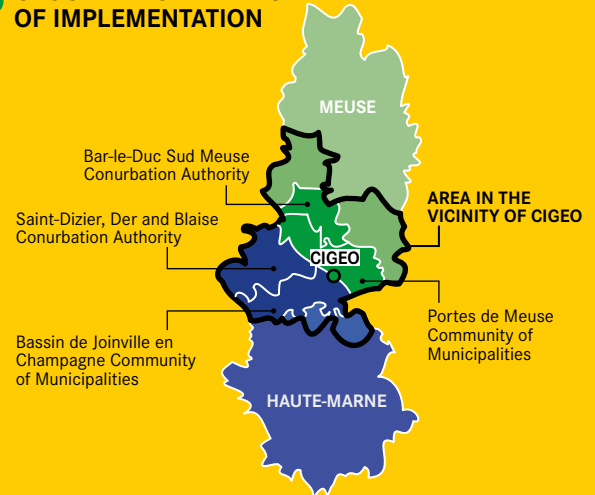
↑ PDT signed by the Minister for Ecology, Emmanuelle Wargon, at the October 2019 high-level committee for the Cigeo project



The regional development project is a key document for all the stakeholders involved in Cigeo. As part of a win-win strategy, it draws up a roadmap combining the project requirements with opportunities for regional development.

David MAZOYER,
Director of the Meuse/Haute-Marne Centre

3 GEOGRAPHICAL AREAS OF IMPLEMENTATION



4 STRATEGIC AREAS

Area 1

Carry out infrastructure developments to support the construction of Cigeo

Area 2

Boost the socio-economic potential of the surrounding area

Area 3

Enhance the attractiveness of the two *départements* through structural development measures for the region

Area 4

Preserve the long-term economic and environmental excellence of Meuse and Haute-Marne

64

PROJECTS

38 actions to be carried out over the 2020-2024 period: development works prior to the construction of Cigeo and economic support actions (Areas 1 and 2)

26 prospective lines of action to be developed and finalised before the construction licence for Cigeo is granted: services for the local population, promoting built and landscape heritage, creating sectors of excellence, etc. (Areas 3 and 4)

24

signatories (the State, local authorities, public interest groups, industrial operators and industry advisory boards)

Over €500M

in planned funding for areas 1 and 2, including almost €200 million provided by Andra. The funding for Areas 3 and 4 will be specified once the licence to construct Cigeo has been granted.

WORKS IN THE REGION

Progress of worksites in Meuse and Haute-Marne

In 2019, Andra conducted various projects of a technical, environmental or heritage nature in Meuse and Haute-Marne.

Geotechnical surveys were carried out between October and December 2019 on a 14-km route between Gondrecourt-le-Château and Saudron. A total of 68 borehole campaigns were carried out to assess the suitability of the land for locating the future private siding (ITE), a railway line which is to connect the national network to the future Cigeo waste package receipt, inspection and preparation zone (known as the Ramp zone), if the project is approved. This geotechnical survey campaign improved knowledge of the soil and subsoil characteristics. Although the boring machines and mechanical diggers have now left the worksite, the piezometers, which are still in place, will monitor changes in the level of the water table.

Rehabilitation of an old foundry

Also in October, the first restoration works began on the area surrounding the former Val d'Osne art foundry in Osne-le-Val: clearing, cleaning, removal of rubble, wood and metal, etc. This rehabilitation work forms part of the initiatives led by Andra to



↑ Geotechnical borehole campaign

June 2019, more than 67,250 tonnes of waste were removed and taken to the Meuse and Côte-d'Or landfill sites. —

67,250

tonnes of waste removed from the former Gondrecourt-le-Château landfill site

Cleanup of an old landfill site

Earlier in the year, another operation was completed: the pollution cleanup of the former Gondrecourt-le-Château/Horville-en-Ornois landfill site, owned by Andra. In order to improve the local environment, between October 2018 and



← Clearing the Gondrecourt-le-Château landfill site



Three field operations were conducted in 2019: a geotechnical survey campaign on the footprint of the future Cigeo private siding, if the project is authorised; the first phase of works on the former Val d'Osne art foundry to restore and highlight local industrial heritage; and the clearing and pollution cleanup of the former Gondrecourt landfill site.

Frédéric Marchal,
Territorial Integration Department Head

CONSULTATION

Two new topics for discussion on the Cigeo project

The consultation with the public on the Cigeo project continued in 2019 with two new subjects: energy, and spatial planning and quality of life. As in previous years, there were different formats offering participants the chance to learn and express themselves: conferences, meetings, workshops, etc.

Energy: an opportunity for the region

The consultation on energy began in February with an Andra conference entitled “Energy Resources for Cigeo and the Region”. Operating Cigeo will require 16,000 megawatt hours of energy per year to heat, ventilate and cool the surface buildings and to provide air treatment in the underground facilities. Thanks to information provided by experts in the energy sector and discussions with the room, three sources of thermal energy other than fossil fuels were favoured: biomass, heat recovery and anaerobic digestion. Workshops held between March and June 2019 then furthered the discussion with participants (local residents, elected representatives, chambers of agriculture, farmers,

stakeholders in the forestry sector, local industry, etc.).

At the end of these discussions, three main options stood out. Andra’s primary choice was to use biomass boilers in Cigeo surface facilities, coupled with gas boilers to provide a backup power source, as well as to set up two connecting stations: one linked to an external heating network, the other to the gas network, in order to retain the possibility of switching to other solutions in the future. Two other options came out of the consultation, which Andra is committed to studying alongside the other stakeholders in the region in order to modify, if necessary, the reference solution selected by the Agency at this stage: firstly, the creation of a centralised boiler room outside Cigeo that uses biomass and/or heat recovery; and, secondly, the implementation of a gas network that can be connected to anaerobic digesters.

Spatial planning and quality of life

The consultation on spatial planning and quality of life began in November 2019 and will continue into 2020 and the coming years. Closely affecting the daily life of the local community, it covers a large number of concerns, some of which were raised during the door-to-door operation that Andra



organised in June. At the kick-off meeting, six topics were presented and discussed more than others, namely: spatial planning, the impact of the Cigeo worksite, environmental monitoring, public services, employment and housing. A second public meeting was held in December. It complemented the information provided at the kick-off meeting on the consequences that the construction and operation of Cigeo will have on the environment and led to the definition of a programme of workshops planned for 2020. —



Two new topics were opened up to consultation on the Cigeo project: one on the subject of energy, the other on spatial planning and quality of life. The objective is to meet both the expectations of the local community and the project requirements. The participants help us to make the best possible decisions and to effectively move the project forward.

Pauline Fournier,
Communications Officer

FOCUS ON

A new door-to-door operation

Following the 2017 campaign, in June 2019, Andra organised another door-to-door operation in around 50 municipalities situated close to the Meuse/ Haute-Marne Centre. The objective was to discuss with local residents directly to better apprehend their perception of Cigeo and answer their questions on the subject, while providing them with information. This gave more than 1,000 households the chance to express their views on the work planned for Cigeo and any potential changes that it may have on their daily lives and the region. These discussions have informed the consultation on the project, particularly with regard to spatial planning and quality of life.



02

Industrial Activities

- 15 Customer Relations
- 16 Andra's Aube Industrial Facilities
- 19 Manche Disposal Facility

Andra currently operates two waste disposal facilities in the Aube, one for the disposal of very low-level waste (VLLW), the other for low- and intermediate-level mainly short-lived waste (LILW-SL), and is responsible for monitoring the first disposal facility for low- and intermediate-level waste (LILW) in the Manche département.

This means that 90% of the radioactive waste produced in France now has a working final disposal solution. To protect humans and the environment from the hazards it presents, the management of this waste in disposal facilities is subject to a number of strict and controlled rules and procedures, while a comprehensive and strict monitoring system is in place to ensure that the impact of the facilities remains very low.

CUSTOMER RELATIONS

Andra is attentive to radioactive waste producers

The safety of Andra's disposal facilities lies in their design principle and the strict rules and procedures governing their operation, as well as on compliance by radioactive waste producers with the specifications imposed by Andra and with French regulations for the handling of their waste packages. In order to support its clients in meeting these requirements, Andra provides them with numerous opportunities for information and discussion.

Close support

In 2019, Andra increased the opportunities for exchange to address some very practical subjects and



to foster communication with radioactive waste producers. This resulted in meetings as well as technical visits to Andra's Aube industrial facilities. In addition to these events, the main producers of radioactive waste in the nuclear power sector (EDF, Orano and CEA) have dedicated contacts available on a daily basis for all of their questions and can exchange

directly about more operational aspects with the technical teams responsible for the management of their waste. Bilateral or cross-disciplinary meetings are also held on a regular basis.

As for waste producers outside the nuclear power sector (hospitals, research laboratories, other industries, etc.), they are offered a full support service until the waste is collected from the production site or processed, where necessary. Finally, Andra regularly organises training courses and plans to send some of its employees to the premises of waste producers in order to obtain a clearer understanding of their constraints.

FOCUS ON

Cleanup and waste collection: Andra's key role

As part of its public duty, Andra is responsible for rehabilitating sites contaminated by radioactivity where the owners have disappeared or failed to fulfil their obligations, as well as for collecting old radioactive objects from private individuals. In 2019, two major cleanup operations recommenced: firstly, a site in Bordeaux, Gironde, where radium pollution had been identified in a neighbourhood under redevelopment; and, secondly, in a municipality in Yonne, where Andra is working to extract radioactive objects found in the cellar of a house and to clean up the premises.

Results of the 2019 customer survey



Management of radioactive waste

99%

SATISFACTION



Quality of communication with Andra

97%

SATISFACTION



Adaptation to customers' specific needs

94%

SATISFACTION



Again this year, the survey of radioactive waste producers reflected a high level of satisfaction with the management of their waste at the Aube industrial facilities.

Patrizio Gobbo,
Client Relations and Solutions
Department Head

ANDRA'S AUBE INDUSTRIAL FACILITIES – ACTIVITY REPORT

A year devoted to dialogue

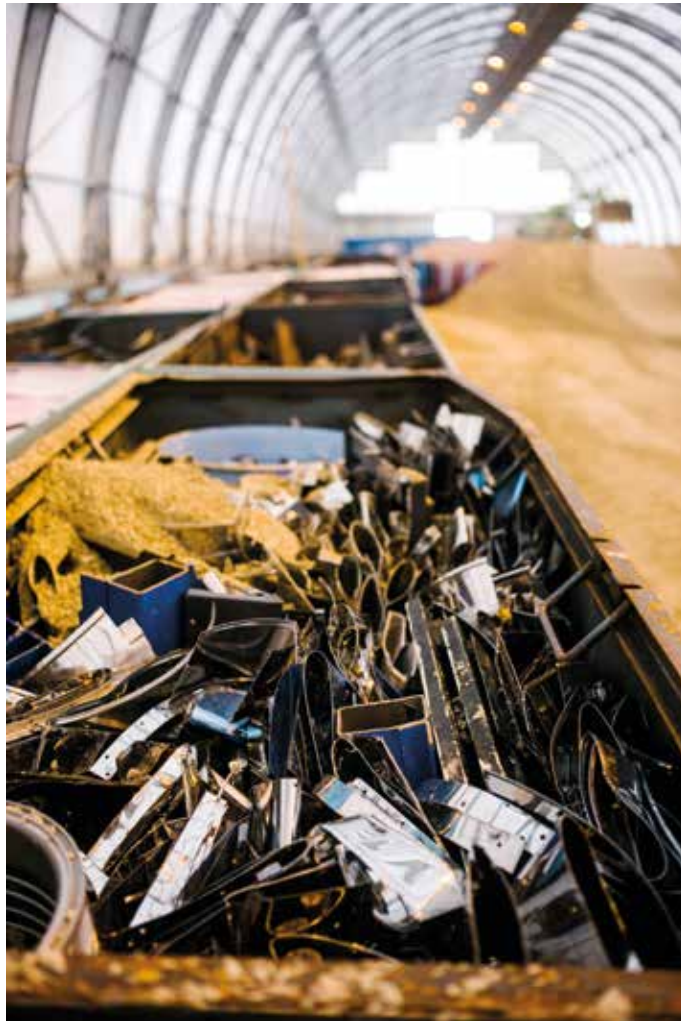
In 2019, the volume of radioactive waste received at the Aube disposal facility (CSA) and the Industrial facility for grouping, storage and disposal (Cires) – respectively responsible for low- and intermediate-level mainly short-lived waste (LILW-SL) and very low-level waste (VLLW) – remained stable in relation to the previous year. The activity of the two facilities was however marked by the management of large waste items. Although few in number, these non-standard waste items require specific authorisation to be accepted at the facilities.

A particular type of waste

In 2019, large, cylindrical items (6 m in length by 2.5 m in diameter and weighing 90 tonnes), used by Orano to transport spent fuel, were received at Cires and disposed of in a trench reserved for large waste items. At the CSA, the last reactor vessel head from EDF's Chooz A nuclear power plant arrived in November 2019. Measuring 3 m in height, 4 m in diameter and weighing 49 tonnes, it required equipment to be adapted from its reception to its disposal. Managing such waste reflects Andra's ability to adapt to the needs of waste producers, while upholding the safety requirements of its facilities.

The help of industrial equipment

Alongside the disposal activity, industrial equipment was also brought up to date. At Cires, waste from outside the nuclear power sector has seen an increase in processing capacity thanks to the improved performance of the sorting and processing facility. At the CSA, 2019 was marked by the commissioning of several workshops and items of equipment



(X-ray imaging, inventories, outgassing measurements, etc.) within the waste package inspection facility.

New VLLW contracts

Finally, at the beginning of 2020, Andra renewed its agreement with EDF, Orano and CEA to manage their VLLW at Cires for the 2020-2024 period. In particular, throughout 2019, Andra discussed the technical and operational aspects of future waste management needs with the producers, as well as forecasts for the coming years (volumes, schedule, etc.). Constructive dialogue that resulted in the signing of two contracts: the revision of the overall contract covering the entire operating life of Cires, incorporating new volume forecasts and changes

in relation to the Acaci project (see focus), as well as a more operational contract laying down the technical and financial terms for the management of VLLW. —



This year, we received several requests to manage non-standard unitary items, including some weighing over 24 tonnes. We examined these requests in close collaboration with the waste producers to verify that they complied with our safety requirements before they were sent to our disposal facilities.

Caroline Manem,
Package Production Monitoring
and Review Officer

FOCUS ON

Acaci project launched to increase Cires capacity

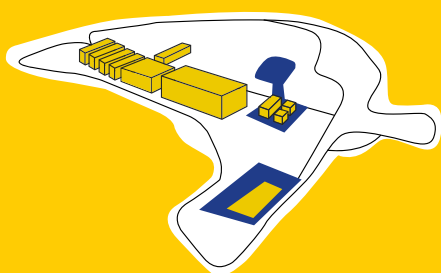


Designed to accommodate a maximum volume of VLLW of 650,000 m³, at the end of 2019, Cires had reached 61% of its total authorised disposal capacity. Given the forecast volumes of waste that will be generated during the future dismantling of nuclear facilities, it will no longer be able to receive all of the waste produced between now and 2028. Thanks to improvements to optimise the repository design completed by Andra, it should be possible to increase the VLLW disposal capacity of the facility over the same surface area and thereby extend the operating life by about ten years. While the Acaci project was initiated in 2019, the licence application is expected to be submitted in 2022.

Key figures in 2019

concerning the operation of Andra's Aube industrial facilities

Aube Disposal Facility (CSA)

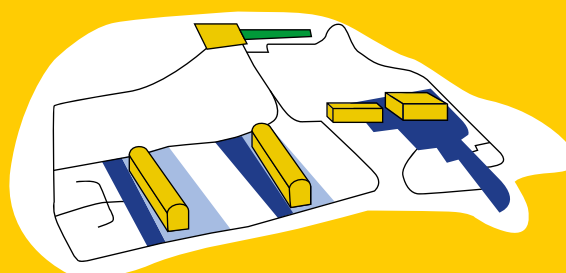


1,000,000 m³

Authorised radioactive waste package capacity

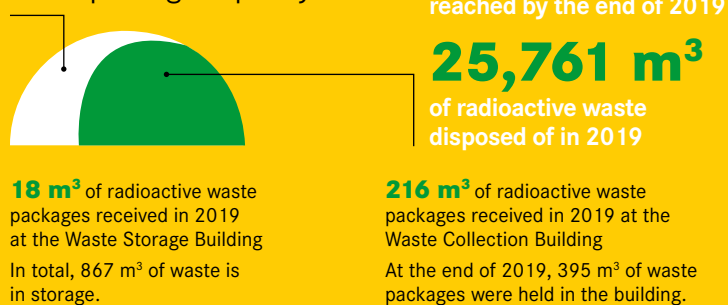


Industrial Facility for Grouping, Storage and Disposal (Cires)

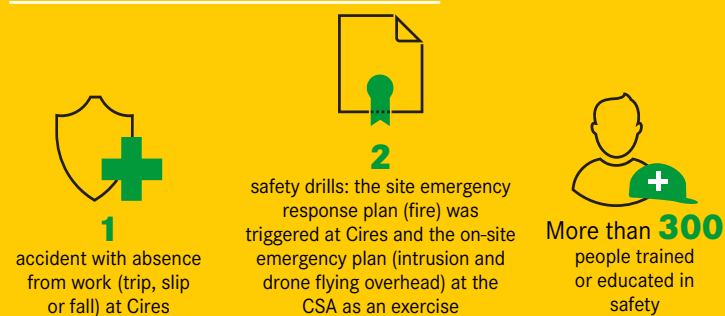


650,000 m³

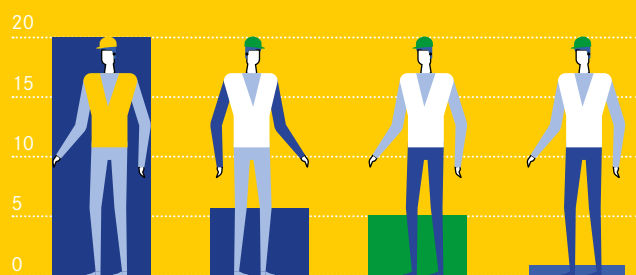
Authorised radioactive waste package capacity



Safety, radiation protection and security in 2019



Statutory dose limits by category (excluding natural radioactivity and medicine)



Category A* workers
20 mSv
over 12 consecutive months

Category B* workers
6 mSv
over 12 consecutive months

Annual limit set by Andra
5 mSv
over 12 consecutive months

For the general public
1 mSv
over 1 year

*Workers occupationally exposed to ionising radiation

ANDRA'S AUBE INDUSTRIAL FACILITIES – MONITORING REPORT

A strict monitoring programme

Designed to protect humans and the environment from the risks presented by the radioactivity contained in the waste they receive, Andra's Aube industrial facilities are subject to an extensive monitoring system to ensure that their impact remains as low as possible and meets the limits defined by the regulations.

Around 17,000 analyses

The monitoring programme is specific to each facility. To develop it, Andra first of all takes into account the characteristics of the disposal facilities and their activities (nature of the waste managed, liquid and gaseous effluent, location of the discharge points, etc.), as well as, secondly, the characteristics of the environment surrounding the facility (geology, behaviour of water tables and streams, weather conditions, biodiversity, human environment, etc.).

At the Aube disposal facility (CSA), approximately **2,550 samples** were taken in the environment in 2019 to carry out **15,410 radiological and physicochemical analyses**. Over the year, the radiological impact was estimated at **0.00000017 milliSieverts**, a dose



2,550

samples taken
at the CSA

well below the regulatory limit and the impact of natural radioactivity. At the Industrial facility for grouping, storage and disposal (Cires), more than **1,500 radiological analyses** were carried out in 2019. The results

did not indicate the presence of any artificial radionuclides added as a result of the facility's activities in the environment.

Governance and transparency

The monitoring programme for the Aube industrial facilities is overseen by the French Nuclear Safety Authority (ASN) for the CSA and the Grand-Est Regional Directorate for



The objective of the monitoring programme is twofold: to check that the impact of the facilities remains as low as possible and to detect any abnormal situations or changes. These data also scientifically back up the answers that we give to local residents or opponents.

Sophie Dinant,
Environment Department Head at
Andra's Aube industrial facilities

the Environment, Town and Country Planning and Housing (DREAL) for Cires. The results of the measurements and their analyses are reported publicly by Andra in its annual reports and published on the ASN and IRSN website, mesure-radioactivite.fr/en. They are also presented at the Local Information Commission (CLI) meeting for the CSA and at the Site Oversight Committee (CSS) meeting for Cires. —



FOCUS ON

End of the controversy over water abstraction in Sauvage-Magny

Within the framework of an administrative and regulatory procedure concerning water abstraction in Sauvage-Magny, Haute-Marne (5.2 km from the CSA as the crow flies), the Regional Health Agency (ARS) conducted

analyses on water quality that revealed the presence of radioactivity in one of the samples. In spring 2019, questions were raised in the local population in relation to the CSA. Andra relied on the measures carried out as part of its environmental monitoring programme and the expertise of hydrogeologists to prove that its activities were not to blame.

In addition, the ARS took further samples, which did not reveal anything abnormal. In December 2019, at the public meeting of the Soulaing Local Information Commission (CLI), the demonstrations and explanations given by Emmanuel Soncourt, an independent hydrogeologist, and the ARS confirmed the answers provided by Andra.

MANCHE DISPOSAL FACILITY

A year filled with events and challenges

In 2019, the Manche disposal facility (CSM) celebrated its 50th anniversary. The first French radioactive waste disposal facility, it laid the foundation for low- and intermediate-level waste disposal systems. It is now in the post-closure phase. Several key events punctuated the year to share, pass on and collectively celebrate the scientific, technical and human experience acquired over half a century of history: a meeting between former and new Andra employees, open days, meetings with local elected officials, etc.

Safety review file submitted

Since its operation ceased, the CSM continues to be subject to rigorous monitoring and regular inspections. In addition to this, as for any regulated nuclear facility, a 10-year safety review process is required. Thus, in 2019, Andra submitted the safety review file for the CSM to the French Nuclear Safety Authority (ASN). The purpose of this review is to verify that the facilities comply with the applicable rules (safety report, general operating rules, on-site emergency

plan, etc.) and to carry out a comprehensive analysis of its safety. As such, the file submitted by Andra reviews several major elements of the safety of the CSM, starting with the cap, in particular reporting on its behaviour and any changes to it, as well as presenting technical solutions required to improve the soundness of its slopes in the long term. It also presents the measurements taken over the past 10 years on the facility's various water management systems (rainwater, cap drainage, water collected at the base of the repository structures) and in the environment (groundwater, streams). The measures of preserving and passing on the memory of the facility to future generations are also assessed. Finally, the safety review identifies the risks that could affect the CSM facilities (earthquakes,



climate change, flooding, etc.) and develops planning scenarios to consider their consequences and define means of prevention. —



Part of the work carried out by Andra in the framework of the safety review aims to ensure that the level of safety of the facility is satisfactory and that the operation of the facility remains in compliance with the current applicable rules.

Catherine Dressayre,
CSM Safety and Memory Officer



Consulting the archives for the Manche disposal facility

Environmental monitoring

In 2019, the Manche disposal facility continued to have a very low impact on its environment.



1,860

SAMPLES taken at or near the Manche disposal facility and 13,050 radiological and physicochemical analyses performed



0.000000015

MILLISIEVERTS:

the impact of discharges into the sea per year

0.00017

MILLISIEVERTS:

the impact of discharges into the Sainte-Hélène stream per year

2.9

MILLISIEVERTS:

the average impact of naturally occurring radioactivity in France



03

Scientific & Technical Knowledge

- 21 Underground Research Laboratory
- 22 Innovation
- 23 European Projects
- 23 Partnerships

In particular, Andra draws its expertise from its ability to incorporate scientific and technical knowledge in all disciplines relating to radioactive waste management. Research and development (R&D) within Andra depends on many scientists and doctoral students, and exceptional research tools, such as its Underground Research Laboratory in Meuse/Haute-Marne and the Perennial Observatory of the Environment along with its Environmental Specimen Bank, as well as a set of simulation tools. It also lies in partnerships with research organisations and participation in many national, European and international research projects. With a very long-term commitment through its activities and projects, Andra also strives to maintain and boost its ability to innovate, particularly by incorporating new technology into the design of its repositories.

UNDERGROUND RESEARCH LABORATORY

New progress at the Underground Research Laboratory

Since its creation in 2000, scientific and technological tests have been conducted in Andra's Underground Research Laboratory in Meuse/Haute-Marne to prepare for the execution of the Cigeo project. In April 2019, a new phase of experiments called "Chantier 4" began for a period of six years. In total, 640 m of additional drifts will be excavated 500 m beneath the ground to carry out new experiments, test out new techniques for monitoring the repository structures and support the examination of the construction licence application to be submitted by Andra for Cigeo. Andra will in particular develop a prototype drift of disposal cells for intermediate-level long-lived waste



(ILW-LL) packages on a scale similar to that of Cigeo (10 m in diameter and 80 m in length), several demonstrator disposal cells for high-level waste (HLW), equipped with new devices, demonstrator closure structures (drift seals and backfill), and excavate a four-branch intersection (X-junction).

A smart robot for monitoring

Another important and innovative step forward was the first test performed in real conditions by a monitoring robot nicknamed SAM (after the French for 'mobile monitoring system') in July in a demonstrator HLW disposal cell. Unique in its kind, the robot SAM was designed to move autonomously and with great precision in small, confined spaces and to take measurements that will serve for the monitoring of Cigeo. To do so, it is equipped with a night-vision

↑ Experimenting on a demonstrator high-level waste disposal cell

camera, laser sensors to detect any potential deformations in the disposal cells, and various other sensors for speed, temperature, atmospheric pressure and relative humidity. It can also carry up to 20 kg of equipment for additional measurements (gas, etc.). The test conducted confirmed that the robot functions correctly in conditions similar to those in Cigeo and tested its ability to obtain the required data. It will be repeated in 2020 to compare the measurements and thereby monitor any changes and the behaviour of the HLW disposal cell over time. —

FOCUS ON

Development works continue

In 2019, a complex maintenance operation was carried out on the elevators in the Underground Research Laboratory to replace the central control system. The second phase of another major project, the redevelopment of the shaft sinking zone (area at the surface containing the shafts of the Underground Laboratory), began in May 2019. The works will create 2,000 m² of office space to renew the old, prefabricated facilities.

Environmental monitoring



In 2019, the Perennial Observatory of the Environment (OPE) pursued its research on the natural environments around Andra's current facilities in Meuse/Haute-Marne (900 km²). Created by Andra in 2007, the OPE is an exceptional tool that takes monitoring further than that required by regulations. Its aim is to survey the initial state of the environment (water, air, soil, woods, wildlife, etc.) in the area hosting Cigeo before any facilities are built, and then to monitor changes to it during the construction and operation phases.



This is the first prototype disposal cell for ILW-LL built at this scale in the Underground Research Laboratory. Through this new phase, we are progressively moving closer to the industrial reality of Cigeo.

Émilie Huret,
Deputy R&D Director

INNOVATION

An ever-ambitious innovation policy

Since its activities have long-term implications, Andra implements an approach to innovation that enables it to adapt to technical, scientific, regulatory and societal changes linked to the disposal of radioactive waste. It takes inspiration in particular from practices and developments both in the nuclear sector and beyond, thanks to an open policy supporting innovation.

Innovation within and outside Andra

In April 2019, Andra participated for the first time in the competition Drim'in Saclay organised by the Essonne Chamber of Commerce and Industry to encourage start-ups, students, industry and researchers to think collectively, and thereby meet challenges when it comes to sustainable development and the energy transition.

The issue that Andra submitted to candidates concerned the recovery of energy from the Cigeo project ventilation system in order to reduce

the energy footprint of the facility. After two days of collaborative work, several solutions were found to improve energy efficiency by combining heat recovery with other sources of energy production (co-generation, solar panels, etc.).

In May 2019, a day dedicated to Andra's research on innovative materials in the framework of the Cigeo project brought together the Agency's external, academic and industrial partners. The search for solutions using new materials, for example geopolymers or ceramics, aims in particular to replace some of the steels planned in the Cigeo project.

Radioactive waste management and dismantling

Andra also supports innovation through a call for projects launched in cooperation with the French National Research Agency (ANR) on the management of radioactive waste from the dismantling of nuclear facilities. Organised as part of the Investments for the Future Programme, this call for projects covers different aspects (characterisation, processing and conditioning, etc.) and invites propositions from the nuclear sector and beyond: players in research and development, research laboratories, SMEs, etc. In October 2019, Andra and the ANR

29

projects selected
through the Andra-ANR
call for projects

dedicated a day to discussions on the 29 projects selected. During the meeting, participants could attend presentations on the projects and demonstrations of some of the technology developed. —



Cigeo is a long-term project with a planned operating period of around 100 years. Identifying potential future solutions and conducting studies from now on is essential to be able to integrate new technology when the time comes in the course of Cigeo construction. It is a responsible approach to continuous improvement.

Nathalie Texier-Mandoki,
Materials Engineer in the Packages and Materials Department
of the R&D Division



EUROPEAN PROJECTS

The contribution of European research

Conscious of the scope of the scientific and technical issues related to its activities, Andra is involved in a number of European collaborative R&D projects in order to pool its efforts with those of its partners. As such, Andra leads the European Joint Programme on Radioactive Waste Management (EURAD), launched in June 2019 for five years. Some 100 European stakeholders in the long-term management of radioactive waste (agencies, assessors, research bodies, etc.) are working to develop a common roadmap on matters related to the long-term management of repositories (management of uncertainties and knowledge), as well as on the upstream phases of radioactive waste management (characterisation, treatment and conditioning of waste, storage, etc.).

The Modern2020 project, also coordinated by Andra, brought together 29 organisations from 12 countries and was completed in May 2019 after four years of work, with the aim of defining methods and technology for monitoring geological repositories that could be applied from the start of construction and throughout operation (including the post-closure phase). Modern2020 has, for example, explored promising solutions, such as fibre-optic sensors that can operate autonomously thanks to innovative power sources. Full-scale tests of wireless data transmission systems were also carried out as part of the programme, particularly at Andra's Underground Research Laboratory. —



One of the major outcomes of the Modern2020 project was the development of a common methodology for defining the parameters to be monitored. Each country undertaking a geological disposal project will be able to apply this to its respective situation in order to define its monitoring methods and produce indicators that will be used to monitor the operation of their repository.

Johan Bertrand,
Instrumentation Engineer in the R&D Division
and Modern2020 Project Manager at Andra

PARTNERSHIPS

High-level cooperation

Andra's research and development policy relies on the expertise of the research bodies, higher education institutions and industrial groups alongside which it works on joint projects. In 2019, three new collaborative initiatives bolstered this partnership approach.

In January, Andra and the National Institute of Geographic and Forest Information (IGN) signed a scientific partnership agreement which will be divided into various projects related, for instance, to the monitoring of Andra's facilities and the 3D modelling of the Underground Research Laboratory, as well as



Partnership signed with the University of Lorraine

detailed mapping as part of the work carried out at the Perennial Observatory of the Environment (OPE) in Meuse/Haute-Marne.

artificial intelligence, knowledge engineering, etc.), while increasing their involvement in the service of the region.

In May, Andra and the University of Lorraine renewed their historic partnership. Among other things, the two partners will pursue their cooperation in the field of geoscience and extend it to new disciplines (robotics, digital models, applied mathematics,

Finally, in July 2019, Andra, CEA and EDF's Research and Development Department signed a research partnership agreement on radioactive waste management, in particular on matters related to the Cigeo project. —



Partnership signed with IGN





Comment est élaboré
le programme
de surveillance
de l'environnement ?

04

Openness to Society and the World

25 Memory

26 Information and Dialogue

27 International

Dialogue and foresight are at the heart of Andra's approach of openness to society. Andra provides clear, verifiable and transparent information on the management of radioactive waste. It meets with the public and fosters dialogue with its stakeholders, both in France and abroad, since Andra is highly involved in international cooperation on waste management. Openness to society is also a key aspect of the preservation and transmission of the memory of radioactive waste repositories.

MEMORY

Art serving memory

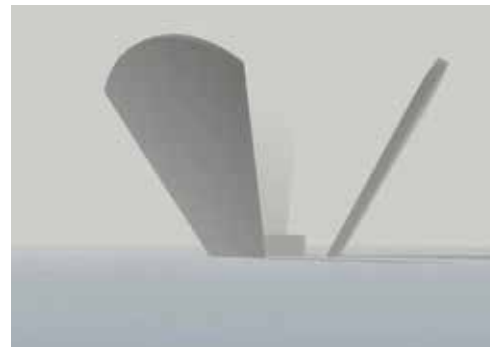
As part of its programme “Memory for Future Generations”, Andra holds continuous discussions on the preservation and transmission of the memory of its radioactive waste disposal facilities. Because of its ability to evoke messages and be understood universally, art is one of the vehicles of this approach. For several years, Andra has therefore regularly invited artists from all disciplines to contribute to the collective discussion in the framework of the call for “Art & Memory” projects in order to envisage how the memory of radioactive waste disposal facilities could be passed on to future generations. Prizes for the third year of the competition were presented in February 2019. The first and second prizes, attributed by a jury made up of Andra employees and experts from the arts sector, were awarded respectively to artist

and director Laure Boby (Termen project) and to artists Tugba Varol and Adrien Chevrier (Implore/Explore project). Sound designer, artist and teacher Florian Behejohm was awarded the public prize, presented by a jury composed of residents living near Andra's facilities, for his Lithonance project.

After participating in the competition previously and being called on by the Meuse/Haute-Marne working group on memory, the artist Olivier Terral gave life to his project in collaboration with the local population living near to Andra's Underground Research Laboratory. Between October 2017 and March 2019, visitors to the Laboratory, and then to cultural festival RenaissanceS in Bar-le-Duc (sponsored by Andra), were invited to add their fingerprints to a painting called *Devoir de mémoire* [Duty of Remembrance]. A work focused on the future that compels future generations to continue to pass on the memory of radioactive waste disposal facilities.



The Termen project proposes a triptych of tumuli (hills) composed of natural and artificial geological strata

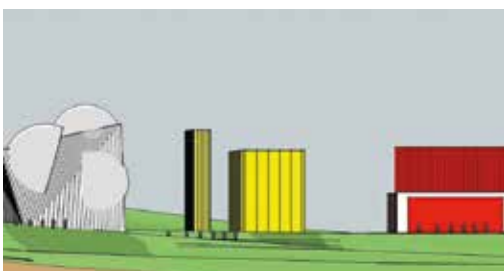


The Implore/Explore project proposes a monumental architectural work, housing a low-level radioactive waste package, as a warning sign for archaeologists

Beyond words

Written transmission is another of the areas that Andra is exploring. In particular, Andra is looking into a universal graphic signage system that can pass on the message over thousands of years. It joined forces with the national graphic design centre Le Signe, in Chaumont, to launch the “Graphic Prospects”

project, a programme of art residencies on the memory of radioactive waste repositories focusing on the theme of signage to indicate the hazards presented by the waste. Graphic design theorist Charles Gautier and graphic designer Sébastien Noguera were selected in September 2019 to participate.



The Lithonance project proposes a system of megaliths, at once architectural, visual and audible



Art is a powerful vehicle of expression and dialogue. In our world of engineers, it opens our eyes and feeds into the rational, logical approach with a creative, more intuitive and manifest approach: this is what artists contribute to scientists.

Jean-Noël Dumont,
Head of Andra's “Memory for Future Generations” Programme

INFORMATION AND DIALOGUE



Innovative communication campaigns

Since the question of radioactive waste concerns all citizens, Andra endeavours to inform and interest as many as possible through innovative means of dialogue that encourage expression and broaden the discussion beyond the technical and scientific challenges. In May 2019, the Agency partnered with the magazine *Polka* to launch a photography competition open to all with the theme of “unusual places”. Both amateur and

professional photographers were invited to take shots of hidden, secret, surprising or disconcerting places. It provided the opportunity to raise awareness among the public of the traces left by humans and the preservation of memory. Sponsored by the photographer duo Yves Marchand and Romain Meffre, accustomed to photographing the out-of-the-ordinary, the competition garnered more than 1,000 photos submitted by almost 400 participants, five of whom were awarded prizes in November 2019.

Dialogue open to art

The theatre was in the spotlight at the Aube disposal facility (CSA): in June and September 2019, on the occasion of the open day, the facility’s working group on memory presented sketches to the public of dramatised readings written based on documents produced by the group over the past seven years. For its part, for its 50th anniversary, the Manche disposal facility (CSM) organised a dramatised tour of its facilities, offered to the public during its open day in September and then again during a ceremony in October. After theatre, comics in turn became a vehicle for dialogue on the subject of radioactive waste. In June 2019, a digital comic called *480 mètres*

sous terre [480 Metres Underground] was produced by nine students from the art school École Estienne as part of their educational curriculum. After visiting Andra’s Underground Research Laboratory in Meuse/Haute-Marne, they drew their experience, feelings and thoughts on the geological disposal of radioactive waste. Finally, a comic book called *La Mémoire oubliée* [Forgotten Memory] was published in November 2019 by the working group on memory for Andra’s Meuse/Haute-Marne Centre. It is the fruit of two years of work and aims to raise public awareness of the importance of passing on memory. It took inspiration in particular from a work awarded during the “Art & Memory” competition organised by Andra: *Cloud In/Cloud Out* by Alice and David Bertizollo. —

FOCUS ON

Andra, transmitter of scientific and technological culture

Andra regularly holds events at its facilities in the Aube, many of which are linked to major national or regional events in the fields of science, technology and the environment. This programme of events forms part of Andra’s activities to inform the public, but is also designed to promote openness and disseminate scientific and technical culture. In 2019, for example, the Aube industrial facilities organised an Observe the Moon evening and a conference with astronaut Patrick Baudry on the occasion of the 50th anniversary of the first footsteps on the Moon. At the Meuse/Haute-Marne Centre, a new scientific exhibition entitled *Travel Through the Solar System and Beyond* was opened to the public.



Over **18,000**
visitors welcomed
to Andra’s facilities,
including more than 1,800
on the open days

226

local projects supported



850,000
copies of Andra’s
newsletter printed



200,000
visits to Andra’s
website



1,382
public comments online (Twitter,
Facebook, YouTube, etc.)



We want to give all sectors of the public the opportunity to express their views, through their own way of thinking and expressing themselves, in order to rouse citizens’ interest in the management of radioactive waste. We give them free rein; everyone is free to express themselves in the way they want.

Annabelle Quenet,
Communications and Dialogue with
Civil Society Department Head

INTERNATIONAL

Know-how to be shared

The French system for managing radioactive waste is one of the most advanced in the world and attracts interest from many countries. This means that Andra welcomes foreign delegations every year and has also signed around 20 cooperation agreements with the main agencies or bodies abroad responsible for radioactive waste. This is notably the case for the Emirates Nuclear Energy Corporation (ENEC), the organisation in charge of waste in the United Arab Emirates, with which an agreement was signed in January 2019 for the development of a radioactive waste management programme.

Major meetings

Maintaining international relations is also for Andra a way of contributing to the development of a shared vision of management solutions, of sharing its know-how and, in return, of broadening its own reflection. Andra is notably involved in the radioactive waste commissions of the Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA).

It also participates in working groups, committees and events on scientific, technological and societal issues. In January 2019, it took part in the latest public meeting of the CoRWM, the committee of experts responsible for assessing the UK approach to high-level waste management, where it presented its experience of dialogue with society on the Cigeo project. In February, alongside the French National Institute for the Study of Industrial Environments and Risks (INERIS) and the GéoRessources laboratory at the University of Lorraine, Andra co-organised the international COGGUS* meeting in Nancy on numerical geoenvironmental and geomechanical modelling and its applications for underground and surface structures.

Exchanging and promoting expertise

In May 2019, the Manche disposal facility (CSM) hosted the Belgian, Spanish and British agencies for two working days dedicated to the caps of radioactive waste disposal facilities. On that occasion, the four agencies signed a cooperation agreement to draw on and share their expertise on the subject. Andra was also involved in organising the Euroclay conference, held in



Cooperation agreement on disposal facility caps signed between Andra and its British, Belgian and Spanish counterparts

July 2019 on the subject of clays. It proposed a tour of its Underground Research Laboratory in Meuse/Haute-Marne following the event. Finally, the annual meeting of Disponet, the international network of radioactive waste management agencies created under the aegis of the IAEA, took place in Cherbourg in October 2019. Andra provided its expertise on the closure of a disposal facility through its experience with the CSM. —



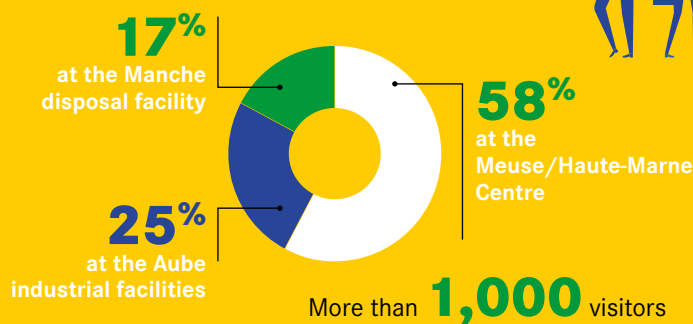
Andra is regularly called upon by international agencies to participate in expert missions or working groups, and also welcomes foreign experts to present its expertise and facilities to them. These international exchanges contribute to the responsible management of radioactive waste throughout the world.

Soufiane Mekki,
International Cooperation and Development Officer

** Computational and Geoenvironmental Geomechanics for Underground and Subsurface Structures.*

Focus on

ALMOST A HUNDRED VISITS
by foreign delegations to Andra's facilities



MAIN NATIONALITIES



Algeria



Belgium



China



Germany



Italy



Japan



Russia



South Korea



Spain



Switzerland



United Kingdom



Find us at
andra.fr



AGENCE NATIONALE POUR LA GESTION
DES DÉCHETS RADIOACTIFS
1-7, rue Jean Monnet
92298 Châtenay-Malabry cedex, France
Tel. +33 (0) 1 46 11 80 00
www.andra.fr