

Intergenerational Challenges in Promoting the Geological Disposal Project and Safety Communication

Japan Nuclear Waste Management Organization Public Forum

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01.

General presentation on Andra and the Deep Geological Repository (DGR) “Cigéo”



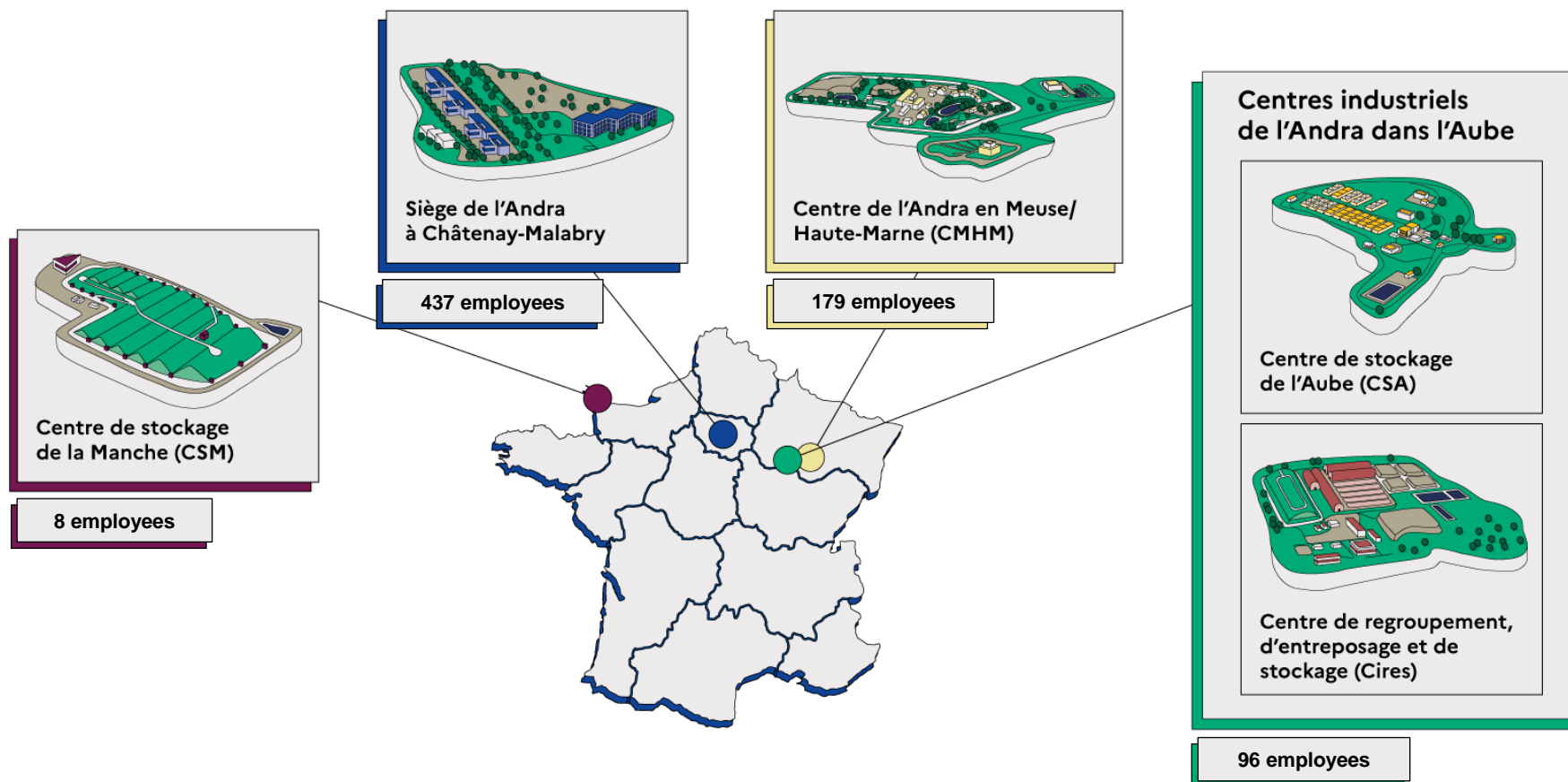
Andra

French National Radioactive Waste Management Agency

1 Public agency

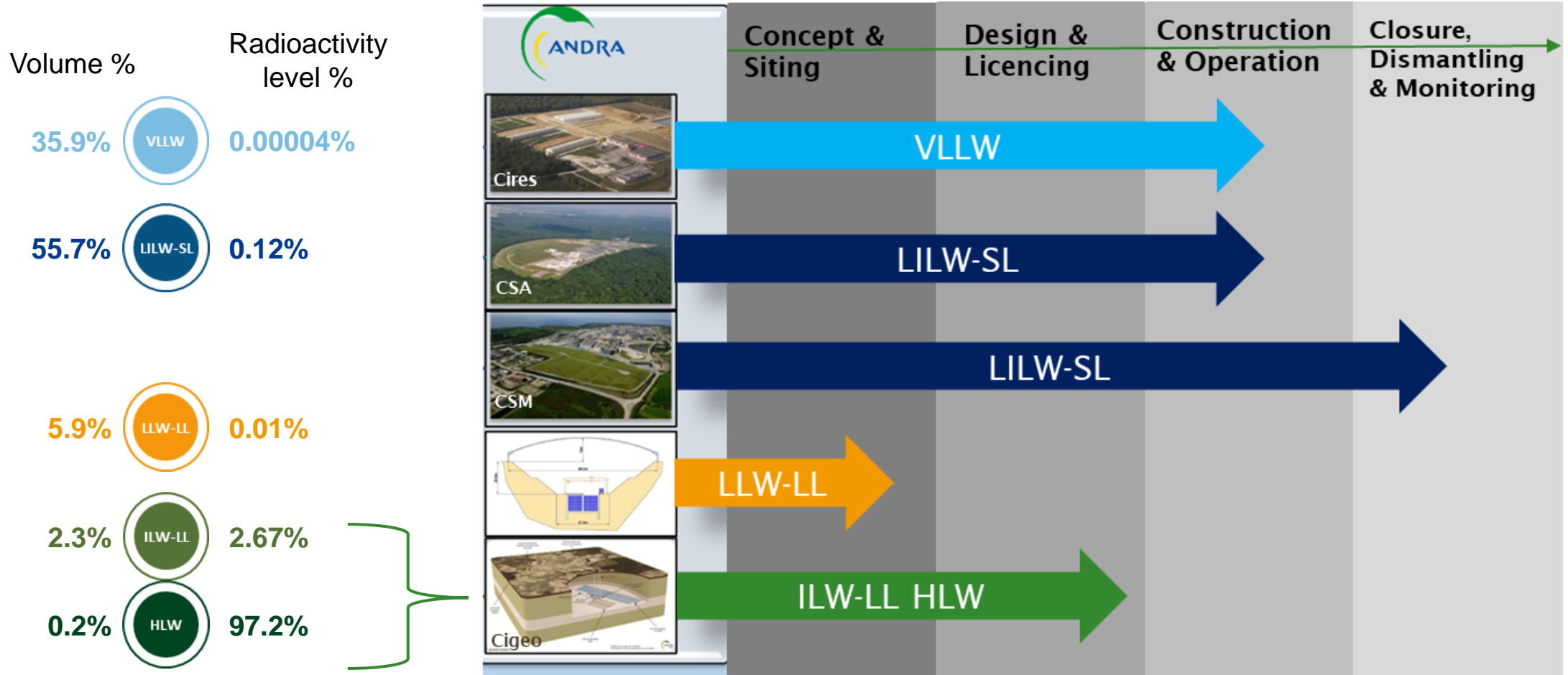
5 foundational missions

720 employees



Disposal solutions and Projects status in France

91.6% of radioactive waste has a disposal solution



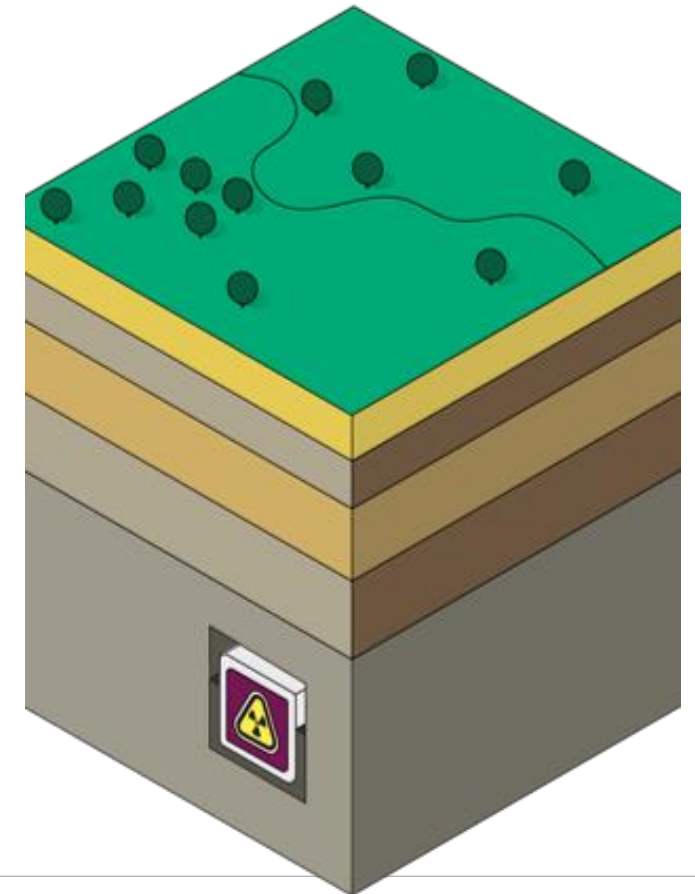
The aim of DGR => protect the population and the environment over the very long term without requiring human actions.

.Located at such a deep level, it will not be at risk from any long-term natural changes (climate, erosion, etc., nor from any societal upheaval.

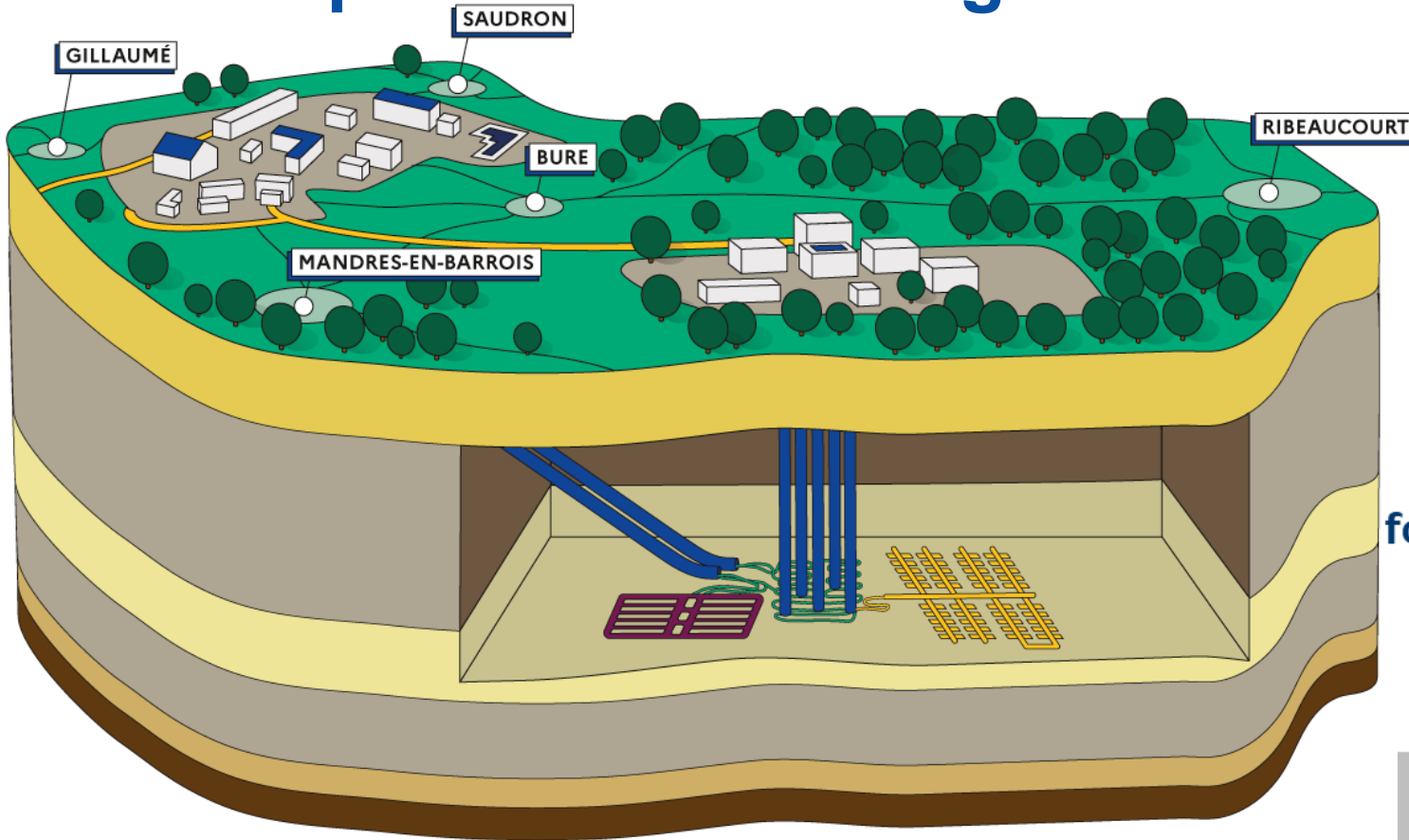
Principles:





- Isolate the waste from the population and the environment (depth of disposal).
- Contain the radioactive substances and limit circulation (thanks to the properties of the geological stratum).

The clay layer forms a natural barrier, which will take over from the human structures.



The Disposal facilities “Cigéo”

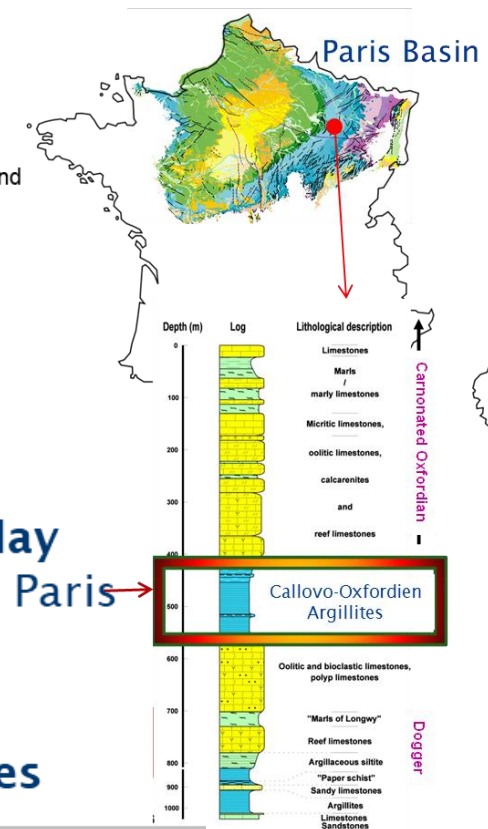


-  **Ramp zone**
Waste package reception, inspection, and preparation
-  **Shaft zone**
Construction support
-  **ILW-LL disposal section**
-  **HLW disposal section**

Disposal facility in a **clay formation** located in the Paris Basin

Favourable properties

- Age : 160 million years
- Thickness : 130 - 170 m
- Depth : 420 - 580 m



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The DGR-Cigéo Communication evolved since the beginning of the project in 1991



One generation of dialogue since 1991

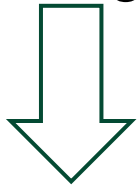
The dialogue has evolved according to the step-by-step development with precise objectives/questions at each stage.

As far as the project have moved on, the design, operational safety, environmental impacts, etc. are gaining importance, even if the post-closure remains an intangible pillar, and the dialogue is broadening.

At the end, it's all a question of trust between the interlocutors ...

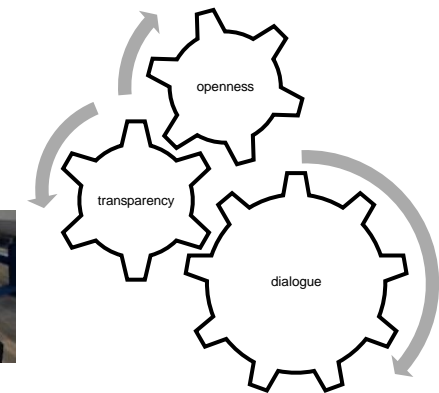
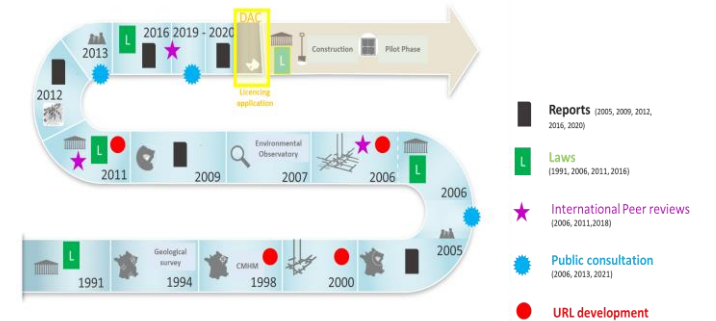
Many challenges...

Challenge of maintaining a dialogue that keep being renewed for successive generations



Challenge to use different/complementary tools, context and rules...

but the DGR principles remain the same



Involvement process

Create
interest &
be visible

“
Conduct
a
dialogue
”

Participate
in local life

“
Inform &
explain
”

“
Consult
”

Publications adapted to publics (beginners, average and informed) and evolving with new technics

Brochures, periodicals, videos, websites, Social media, networks ... (e.g <https://fr.linkedin.com/company/andra-france>)

Technical documents made available on Andra site and in local sites

Visitors' centers - Temporary exhibitions

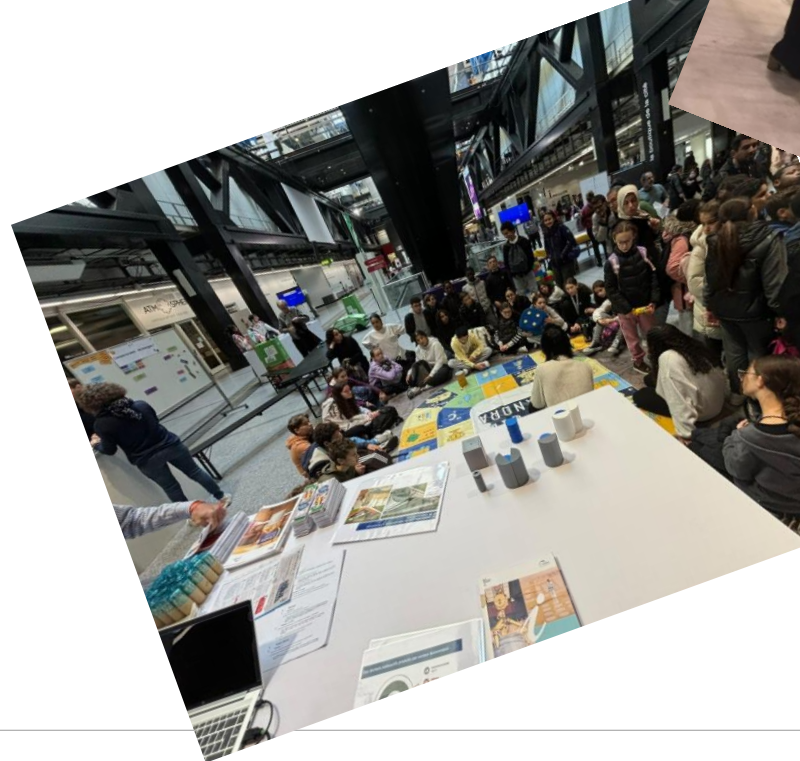
Door to Door campaigns in the nearby municipalities, carried out by employee ambassadors

Continuing innovation in communication tools and manners to adapt to new generation ...



Widen and diversify audiences

- Make sure it's not always the same types of publics who will contribute
- Gather a wide range of views on the project (that go beyond opinions on nuclear energy)



Innovation to stimulate dialogue



“Nothing in life is to be feared, all need to be understood” (Marie Curie)

Street Art – Argadol Mural on the wall of disposal facility

“It is easier to break an atom than a prejudice” (Albert Einstein)



Radio-actif
podcast
Series of 6
episodes on
heritage
“A heritage that shines”



Role-playing a parliamentary debate

4

Illustrations



Communicate : supports

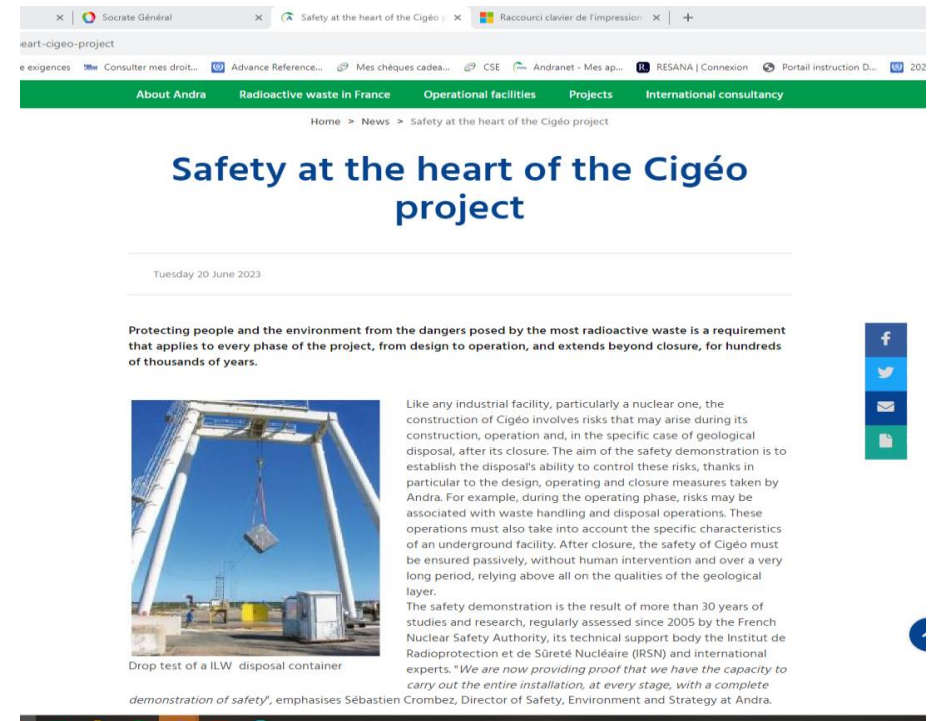
Successive safety cases dossiers made available for public by Andra as well as the national reviews and international reviews

- Post-closure and pre-closure safety need to be readable for public (e.g synthesisi and guide for lecture)
- Dedicated pages in Andra Journal/web for questioning topics

<https://international.andra.fr/index.php/projects/cigeo/protection-most-hazardous-radioactive-waste/geological-disposal-protection>

<https://youtu.be/D20XXAYmUuI>

<https://youtu.be/RJfVOs5GedI?t=7>



The screenshot shows a web browser window with the URL 'eart-cigeo-project'. The page has a green navigation bar with links: 'About Andra', 'Radioactive waste in France', 'Operational facilities', 'Projects', and 'International consultancy'. Below the navigation bar, the main heading is 'Safety at the heart of the Cigéo project' in blue. The date 'Tuesday 20 June 2023' is displayed. The main text reads: 'Protecting people and the environment from the dangers posed by the most radioactive waste is a requirement that applies to every phase of the project, from design to operation, and extends beyond closure, for hundreds of thousands of years.' Below this text is a photograph of a large industrial crane lifting a container. The caption under the photo is 'Drop test of a ILW disposal container'. To the right of the photo, there is a vertical column of social media sharing icons (Facebook, Twitter, Email, Print). The bottom of the page features a quote: 'The safety demonstration is the result of more than 30 years of studies and research, regularly assessed since 2005 by the French Nuclear Safety Authority, its technical support body the Institut de Radioprotection et de Sécurité Nucléaire (IRSN) and international experts. "We are now providing proof that we have the capacity to carry out the entire installation, at every stage, with a complete demonstration of safety", emphasises Sébastien Crombez, Director of Safety, Environment and Strategy at Andra.'

<https://international.andra.fr/projects/cigeo/safety-anticipating-risks>

Communicate : Meet, explain and debate



Visits and Open days at the at the
Meuse/ Haute Marne Center (URL)

Around 7 000 visiteurs en 2023

200 000^{ème} visitor en 2024



DISEF/DIR/24-0101



Communicate with new generation- Student workshop - « Welcome in 2050 » ! »



Un texte important fait son entrée à l'Assemblée nationale : il concerne Cigéo, le centre de stockage des déchets radioactifs français les plus dangereux situé en Meuse/Haute-Marne.

Après 30 ans de recherche et 20 ans d'exploitation, Cigéo arrive à la fin de sa première phase, qualifiée de « phase industrielle pilote ».

Un premier temps de construction du centre, en surface et en souterrain, a été lancé dès 2030.

Le retour d'expérience de cette première phase d'exploitation sera au cœur des discussions parlementaires. En effet, c'est à partir d'aujourd'hui que sont lancés les débats pour décider des conditions de poursuite du projet. La chambre des députés de la toute nouvelle VII^{ème} République, dont les membres ont été tirés au sort en début d'année, sera la première à étudier le sujet. La chambre des députés, élue au suffrage universel, se prononcera dans un second temps. Pour la présidente de la République, la loi à venir est « décisive pour les générations futures ».

Cette étape a débuté dès la publication du décret d'autorisation de création de l'installation dans les années 2020. Le principe de Cigéo est de protéger l'Homme et l'environnement de la dangerosité des déchets radioactifs, en les stockant dans des galeries à 500 mètres sous terre au sein d'une couche géologique stable depuis 160 millions d'années.

Des essais de stockage de colis ont ensuite été réalisés afin de tester l'installation industrielle en grandeur réelle. Suite au contrôle et à l'autorisation de l'Autorité de sûreté nucléaire, nous avons procédé à des essais de stockage de véritables colis de déchets radioactifs mais aussi à des essais de retrait afin de conforter la réversibilité du stockage. Nous indiquons Emma Moreau, Directrice générale de l'Agence nationale pour la gestion des déchets radioactifs (Andra), agence publique en charge de l'exploitation du projet.

EXCLUSIF DANS L'ESPRESSO
EN 2024, L'ANDRA AVAIT ORGANISÉ UNE PREMIÈRE SIMULATION DE CE DÉBAT AVEC DES ÉTUDIANTS VENUS DE TOUTE LA FRANCE. RETROUVEZ LE TÉMOIGNAGE D'UN DES PARTICIPANTS (P. 2).



Communication with new generation- Student workshop - « Welcome in 2050 » ! » Outcomes



- Contributions extending beyond technical issues
- A way of informing a young audience about the project
- Raising awareness of the issues involved in political decision-making
- The need to protect future generations and the environment



- <https://www.youtube.com/watch?v=pkINvmK0sMY&t=125s>

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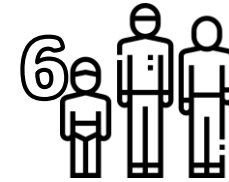
Challenge to maintain knowledge from generation to generation



Successive generations working on deep geological disposal



Overall duration of the French deep geological repository (DGR) “Cigéo” operations



Number of successive generations and careers/disciplines to oversee “Cigéo” project

Practices currently being implemented at ANDRA



Traceability of key principles evolution & Experience Feedback
Integrate with Safety case development processes



Strategic Analysis of Knowledge
Integrate with System engineering and project management processes



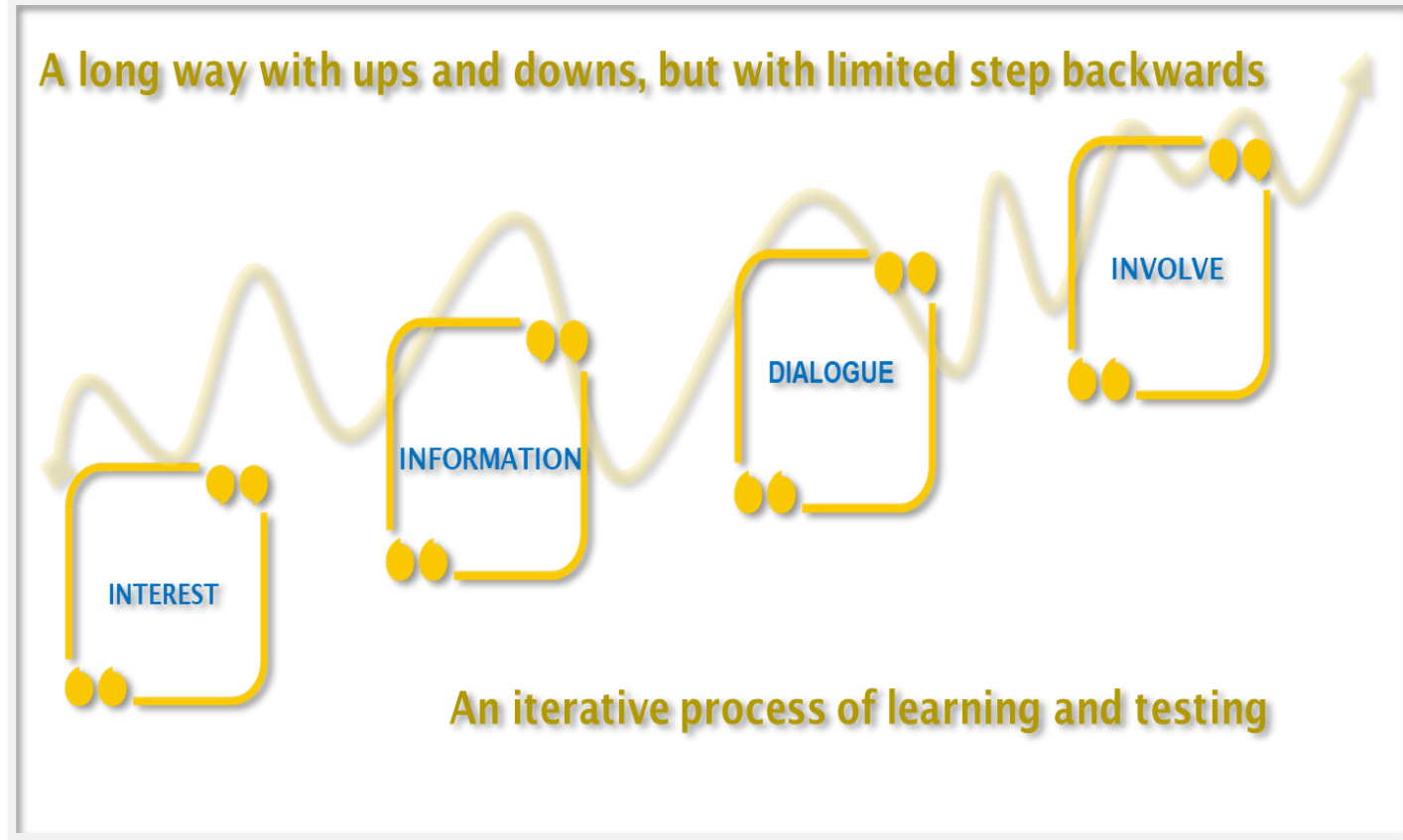
Embed knowledge control practices
➤ Integrate with Business operation processes



Organizational promotion of knowledge sharing practices
➤ **Management and Human resources processes**

Conclusion

- ❑ Dialogue evolves according to the step-by-step development with precise objectives/questions at each stage
- ❑ Supporting tools for communication evolve also with time gaining from innovation
- ❑ Dialogue it is not only a technical involvement nor a communication one
- ❑ For a such long project intergenerational communication and knowledge transfer are challenging



THANK YOU FOR YOUR ATTENTION

Thanks to my colleagues Annabelle Quenet and Vincent Maugis



<https://international.andra.fr/>