MODERN 2020

Development and Demonstration of monitoring strategies and technologies for geological disposal

igd·tp

safe solutions for radioactive waste

Modern2020

Development and Demonstration of monitoring strategies and technologies for geological disposal

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IGD-TP Exchange Forum n°6
November 4th, 2015, London

This project has received funding from the Euratom research and training programme 2014-2018 under grant agreement n° 662177

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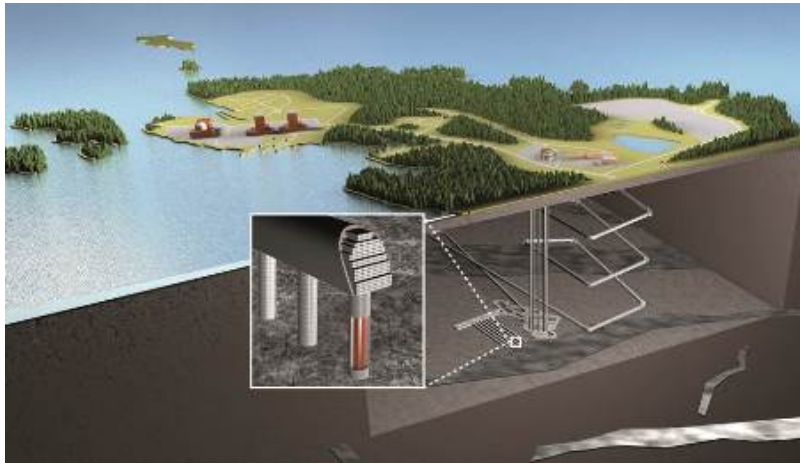
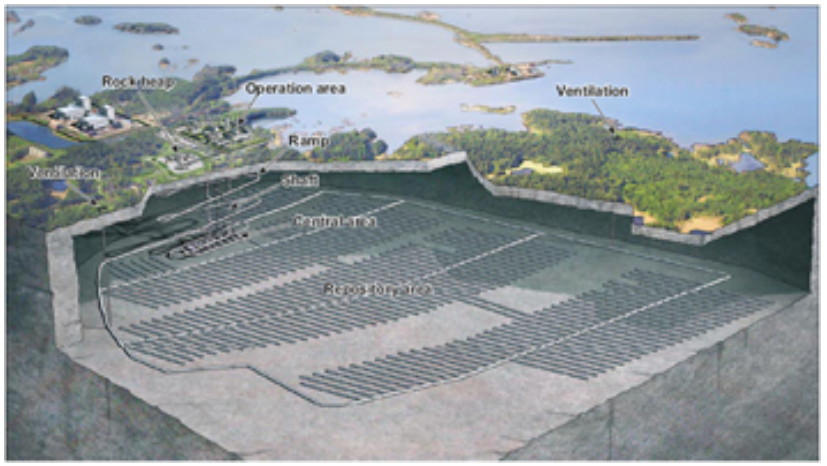
Development and Demonstration of monitoring strategies and technologies for geological disposal

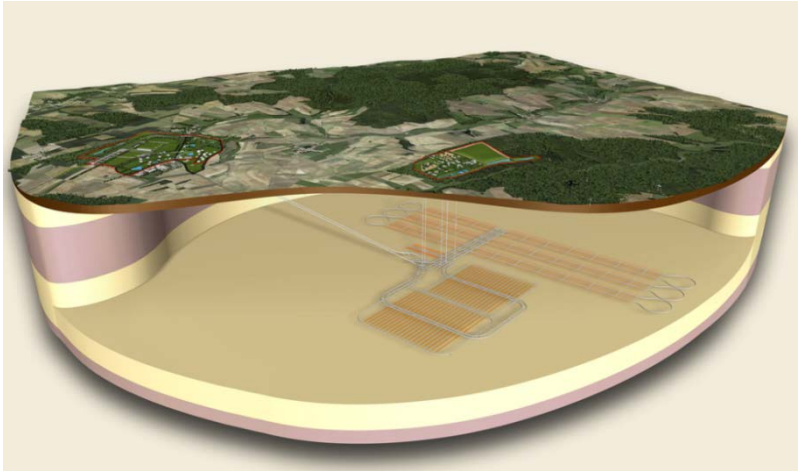
Three countries with the same challenge-License application



Posiva – Finish concept-02/2015



SKB – Swedish Concept-03/2011



Andra – French Concept-2017

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Modern2020 project is a **collaborative project funded by Euratom under grant agreement n°662177.**

It aims at providing a **framework for the development and possible implementation of monitoring** and associated stakeholder engagement during **operational phases** of the radioactive waste disposal process.

EURATOM Research & Training Programme 2014-2018	Call for propositions H2020-Fission-2014 TOPIC: « Contribute to the development of solutions for the management of ultimate radioactive waste NFRP-06-2014: Supporting the implementation of the first-of-the-kind geological repositories
IGD-TP Topic	Joint Activity 7 - Monitoring
Project Duration:	4 years (Start June 30th, 2015)
Total budget : 8,6 million €	**EC contribution** : 6 million €
Website (under construction):	**www.modern2020.eu**

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Modern2020 Consortium

Consortium: 28 partners EU + non-EU countries (Coordinator : Andra)

8 radioactive waste management organisations	ANDRA, enresa, nagra., ONDRAF/NIRAS, POSIVA, Radioactive Waste Management, SKB, SÚRAO
5 organisations undertaking research on radioactive waste management in their respective country	DBE TECHNOLOGY GmbH, ENEA, NRG, RWMC, VTT
1 technical support organisation	IRSN
4 organisations with specialist technical monitoring expertise	Aitemin Centro Tecnológico, AREVA, EDF, ESV EURIDICE GIE
8 academic research units	ETH Zürich, GÖTEBORG UNIVERSITY, TECHNICAL UNIVERSITY OF LIBEREC, CZECH TECHNICAL UNIVERSITY IN PRAGUE, UMONS Université de Mons, Universiteit Antwerpen, Xlim
2 specialist consultants	Galson SCIENCES LTD, NiPia

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Modern2020 objectives

General objective: Provide the means for developing and implementing an effective and efficient repository operational monitoring programme, taking into account the requirements of specific national programmes

Specific objectives:

Stategy

Develop detailed methodologies for screening safety cases in order to identify needs-driven repository monitoring strategies and to develop operational approaches for responding to monitoring information;

Technology

Carry out R&D to solve outstanding technical issues in repository monitoring, (wireless data transmission technologies, alternative long term power supplies, new sensors, geophysics, reliability and qualification of components)

Demonstration and Practical Implementation

Enhance the knowledge on the operational implementation and demonstrate the performance of state-of-the-art and innovative techniques by running full-scale and in-situ experiments

Societal concerns and Stakeholder Involvement

Develop and evaluate ways for integrating public stakeholders concerns and societal expectations into repository monitoring programmes.

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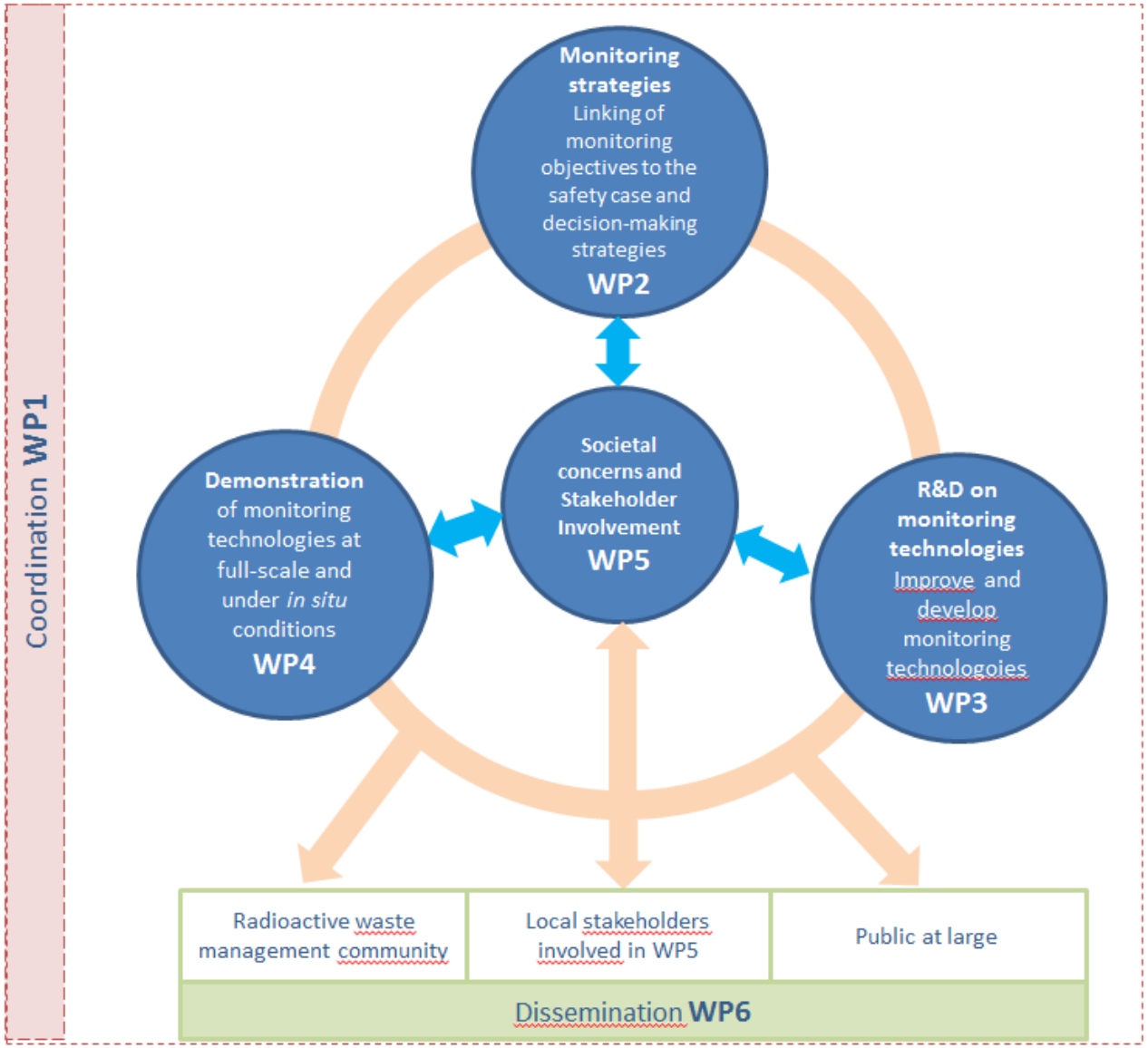
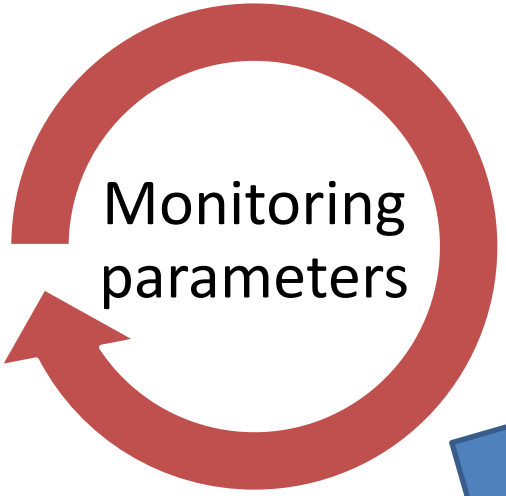
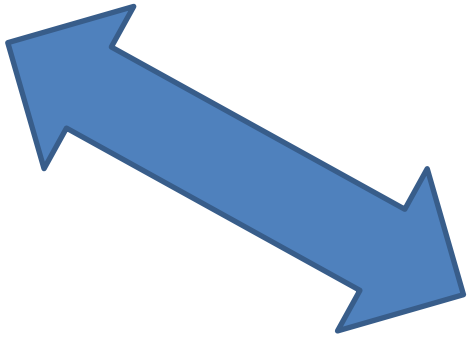
Project struture



WP2: Monitoring Programme Design Basis, Monitoring Strategies and Decision Making



- National context
- design
- Host rock
- Decision making



- Decision making
- Stakeholder

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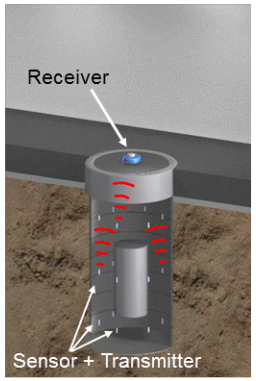
WP3: R&D of relevant monitoring technologies

R&D includes :

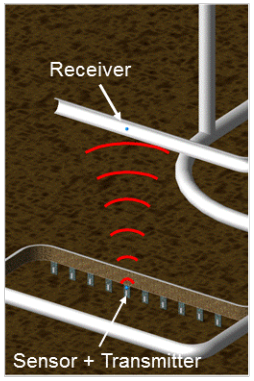
- adaptation of the existing technologies to specific monitoring objectives, host rocks and repository concepts
- development of new technologies for the monitoring of specific parameters
- improvement of the long-term performance of the monitoring components.

Technologies

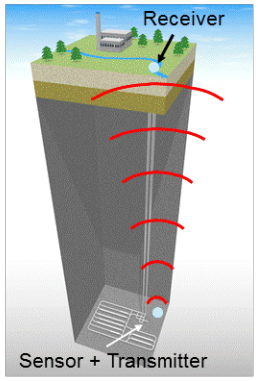
- ✓ Wireless monitoring technology
- ✓ Alternative power supplies.
- ✓ New sensors to measure relevant parameters
- ✓ Improve the most promising geophysical methods for non-intrusive monitoring.
- ✓ Establish a common methodology for qualifying the components of the monitoring system



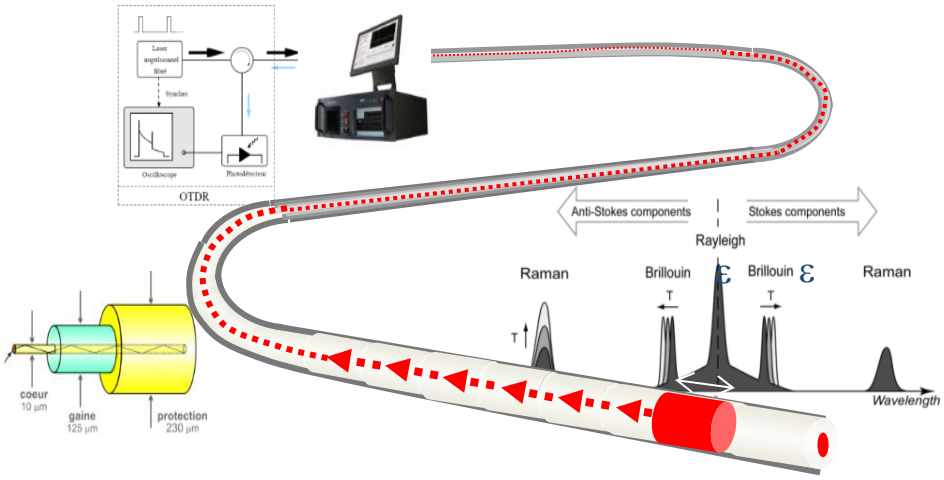
Transmission distance
10 – 20 m



Transmission distance
100 m



Transmission distance
300 - 500 m



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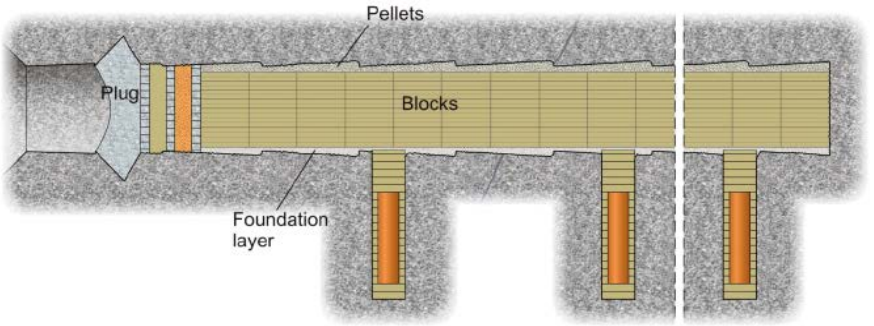
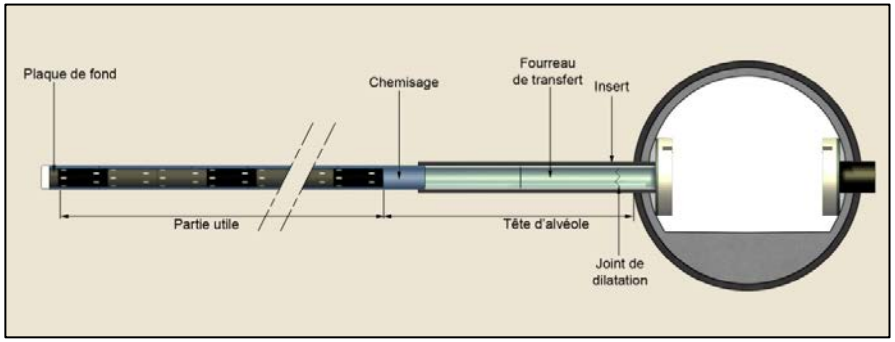
WP4: Demonstration of monitoring implementation at repository like conditions

- Demonstrate new technology developments under *in-situ* conditions in the Finnish, Swedish, French and Swiss concepts.
- Demonstrate the development of a monitoring system design utilising multiple technologies and linked to a specific safety case.
- Utilize existing experience in near-field monitoring to provide guidance on monitoring system design, e.g. by examining whether existing monitoring technologies can provide information on the required parameters, at the required frequency and accuracy.



KBS-3V concept



HA-cell concept

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WP5: Effectively engaging local citizen stakeholders in R&Don monitoring for geological disposal

- Engage local public stakeholders in repository monitoring RD&D
- Integrate public stakeholder concerns and expectations
- Develop ideas on how to ensure accessibility and transparency of monitoring data

> how local stakeholder groups could be engaged effectively with RD&D programmes and projects at an EU level.

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Outcomes & impacts

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Expected outcomes

- By developing practical monitoring strategies, technologies and stakeholder involvement strategies, the work will allow advanced national radioactive waste disposal programmes to design monitoring systems suitable for deployment when repositories start operating in the next decade.

- The work will also support less developed radioactive waste disposal programmes and other stakeholders by illustrating how the national context can be taken into account in designing dedicated monitoring programmes tailored to their national needs

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Expected impacts

- Increase the **mutual understanding** of what can realistically be achieved with regard to repository monitoring and the representation of monitoring data;
- **Resolve the key monitoring issues** to support licensing and implementation of underground repositories;
- Contribute to **resolve the key remaining technical issues** in monitoring for the implementation of geological disposal *;*
- **Maintain and enhance knowledge and competences** in the field of monitoring repositories;
- Consolidate and foster the **cooperation** amongst EU Member States on monitoring subject;
- Increase the possibility for **local public stakeholders** to become engaged at an early stage in the development of monitoring strategies and monitoring technology;
- Identify the potential to increase the **democratic quality** of the overall process of implementing geological disposal as a long term management strategy.

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