



# SUSTAINABLE NETWORK FOR INDEPENDENT TECHNICAL EXPERTISE OF RADIOACTIVE WASTE DISPOSAL

## INTERACTIONS AND IMPLEMENTATION

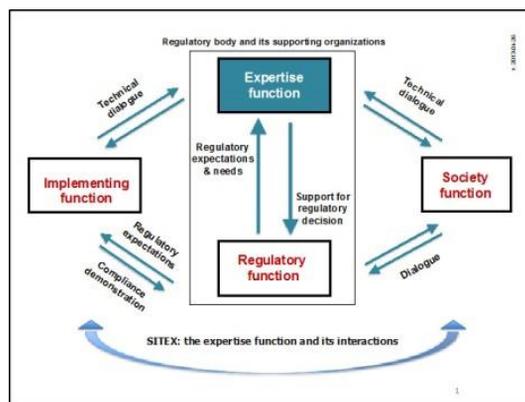
### PROJECT SUMMARY

The coordination and support action SITEX-II was initiated in 2015 within the EC programme Horizon 2020 with a view to further developing the independent Expertise Function network in the field of deep geological disposal safety. It is aimed at practical implementation of the activities defined by the former EURATOM FP7 SITEX project (2012–2013), using the interaction modes identified by that project.

#### A COMMON VISION OF THE EXPERTISE FUNCTION

SITEX-II brings together representatives from 18 organisations involving regulatory authorities (FANC, ASN, CNSC), technical support organisations (Bel V, CVREZ, IRSN, NRG, GRS, DECOM), research organisations (GI-BAS, PSI, LEI), specialists in risk governance and interaction with general public, including NGOs (MUTADIS, ENERGIACLUB, MKG, REC, SYMLOG) and the education institute (ENSTTI)

The network is expected to ensure a sustainable capability for developing and coordinating, at the international level, joint and harmonized activities, necessary for the technical review of a safety case for deep geological disposal of radioactive waste.



The expertise function and its interactions

### SITEX-II OBJECTIVES

- **The definition of the Strategic Research Agenda (SRA)** based on the common R&D orientations defined by SITEX (2012-2013), the definition of the Terms of Reference (ToR) for the implementation of specific topics from the SRA, and the interaction with IGD-TP and other external entities mandated to implement research on radioactive waste disposal regarding **the potential setting up of a Joint Programming (JP) on radioactive waste disposal;**
- **The production of a guidance on the technical review** of the safety case at its different phases of development, fostering a common understanding on the interpretation and proper implementation of safety requirements for developing, operating and closing a geological repository and on the verification of compliance with these requirements;
- **The development of a training module for generalist experts** involved in the safety case review process, including the **implementation of a pilot training session;**
- **The elaboration of the conditions and means for developing interactions with Civil Society (CS)**, in view of enhancing the **quality of reviews and improving the decision-making process;**
- **The preparation of the “administrative” framework for a sustainable network**, by addressing the legal, organisational and management aspects.

#### CONTACTS:

**Coordinator**  
D. Pellegrini (IRSN)  
delphine.pellegrini@irsn.fr

**Technical Secretary**  
M. Rocher (IRSN)  
muriel.rocher@irsn.fr

For further information visit [www.sitexproject.eu](http://www.sitexproject.eu)



As does the developer of a geological disposal facility, the independent experts assigned by the national regulator to the safety case review of such facility must have a broad interdisciplinary competence allowing them to evaluate the safety level, all along the licensing procedure and beyond. Through the decision making process, different technical options may be successively generated and compared by the facility developer to support the reference design definition. The review of such successive safety cases requires to possess a variety of attitudes, skills and competences, such as in environmental sciences, behaviour of radioactive waste, engineering aspects, numerical modelling of radionuclide migration. All these necessary capacities and capabilities of the so called “Expertise function” (see Figure on previous page) may be found internally or provided by external dedicated institutions, research entities, commercial companies and civil society experts.



## THE ROLE OF THE EXPERTISE FUNCTION WITHIN A NATIONAL RWM PROGRAMME

The Expertise Function contributes in activities carried out in the context of the regulatory review of safety case in order to provide the technical and scientific basis of safety for:

- Decisions by the Regulatory Function (national regulatory body),
- Ensuring that regulatory expectations are clearly communicated to and interpreted by the implementer;
- Improving the quality of the interactions with Civil Society (CS) in the decision making process (DMP) in order to contribute to build a robust safety case.

Depending on the national institutional framework, the Expertise Function can be performed inside the national safety authority (included in or performed by subsidiaries) or outside the regulatory body, by an independent technical safety organization (TSO) or by Research Entities or other external organizations like consultants or NGOs specialized in safety. Three key conditions are required in order to both ensure the required level of quality of the Expertise Function and allow its independency:

- Competence, experience and knowledge notably provided by resources and skills independent from implementers in order to avoid conflicts of interests,
- Transparency and proximity to the public, involving public release of its assessments and exchanges with CS, as well as impartiality when delivering a technical opinion mainly afforded by the above requirements.

Interactions between the Expertise and Regulatory Functions contribute in:

- Developing the safety requirements and conditions that have to be fulfilled in order to meet the general safety objective of protecting human and the environment against the hazards associated to ionizing radiations (“regulatory expectations”);
- Assessing the compliance with these requirements and conditions (“compliance demonstration”).

Assessing such compliance requires strong technical support from the Expertise Function. This includes several activities such as independent R&D, reviewing of safety demonstration and inspections.

The Expertise Function interacts with the Implementing Function (Waste Management Organizations, WMOs) through technical dialogue, e.g. on R&D issues, adequacy of safety strategy and safety concept approaches and on risk assessment, whatever inside or outside the formal review of a safety case. The Expertise Function also has to interact with the Society Function (CS), which is indeed **requester** to exchange on these issues. It is requested by the CS to interact on the definition of the R&D programme carried out by expert’s bodies and on safety case review with a specific emphasis on the assessment of the safety strategy and safety concept adopted by the implementer.

**To sum up, if the core activity of the Expertise function consists in conducting safety review, developing its capacities to understand and assess the safety case requires also other activities, including contributing to inspections, implementing R&D in safety as well as interacting with CS along the review process and developing appropriate governance patterns to conduct such interaction.**



## PROGRESS WITHIN WORK PACKAGES OVER 2015-2016 PERIOD

### WP1 PROGRAMMING R&D (LEAD BY BEL V)

- A Strategic Research Agenda (SRA) of the Expertise Function was developed. Globally, a list of possible topics of common interest was issued based on the former SITEX project and inputs from SITEX-II partners. These topics were ranked by the involved partners with regard to their level of interest and priority. The overall outcomes were collectively discussed to consolidate the SRA. During the whole process, exchanges with CS representatives were organized in order to consider their concerns about the content of this SRA. In addition, conditions for implementing a Joint Programming with other actors (WMOs, research entities) were identified and on this basis, all the SITEX-II SRA topics were acknowledged to be eligible for such a Joint Programming.
- 3 WP1 meetings were organized
- 1 deliverable was issued: **D1.1 Setting a Strategic Research Agenda**



*D1.1 – Strategic Research Agenda of the Expertise Function*

### WP2 DEVELOPING A JOINT REVIEW FRAMEWORK (LEAD BY FANC)

- SITEX-II partners shared national experience and prospective views on the interpretation and implementation of safety requirements on optimization of protection and on waste acceptance criteria, which will be documented in position papers. The first structuring steps of developing guidance on reviewing a safety case were carried out: applicable references were gathered, relevant information was summarized and an operative articulation was set out. This was completed with the conception of an excel tool to develop and consult grids for reviewing safety cases at successive phases of a geological repository lifecycle.
- 3 WP2 meetings were organized

### WP3 TRAINING AND TUTORING FOR REVIEWING THE SAFETY CASE (LEAD BY LEI)

- An overview of existing training and tutoring practices used by SITEX-II partners located in Europe and Canada was issued, as well as recommendations for competence building of technical experts (safety case reviewers). On this basis, a training module at a generalist level with emphasis on the technical review of the safety case is being developed, including a pilot training session to be implemented within SITEX-II in June 2017. The syllabus was agreed, together with guidelines for the planning, implementation and evaluation of the pilot session material and training module content.
- 3 WP3 meetings were organized
- 1 deliverable was issued: **D3.1 Synthesis of existing practices for training and tutoring of experts in geological disposal safety**

### WP4 INTERACTIONS WITH CIVIL SOCIETY (LEAD BY MUTADIS)

- Interactions between institutional experts and representatives of CS within SITEX-II took place on 3 thematic tasks, namely R&D (see above), safety culture/review and governance, internally as well as externally through workshops with other CS organisations. The main communalities and differences in the vision of safety culture were investigated as well as the expectations regarding the engagement of CS in the safety case review, leading to conclusions on the conditions and means to involve CS along such a review process. An innovative multi-stakeholders approach of interactions was developed, entitled Pathway Evaluation Process (PEP), presented as a serious game and conceptualized as an exercise of participative and comparative assessment of different parallel alternative scenarios on long-term management of radioactive waste.
- 2 WP4 meetings were organized



*PEP implementation (Budapest, June 2016)*



## NEWS AND UPCOMING EVENTS

### EVENT ANNOUNCEMENT

12-16 June, 2017  
Kaunas, Lithuania

10-15 September 2017  
Barcelona, Spain

24-27 September 2017  
Davos, Switzerland

6-7 November 2017  
Paris, France

Short information about coming SITEX-II project related events:

**SITEX-II training course** for generalist experts on Regulatory review of the Safety Case for Geological Disposal

**MIGRATION CONFERENCE 2017** (The 6th International Conference on the Chemistry and Migration Behaviour of Actinides and Fission Products in the Geosphere)

**CLAY CONFERENCE 2017** (The 7th International Conference on Clays in Natural and Engineered Barriers for Radioactive Waste Confinement)

For further information visit: [www.clayconferencedavos2017.com](http://www.clayconferencedavos2017.com)

**EUROSAFE 2017**

For further information visit: [www.eurosafe-forum.org](http://www.eurosafe-forum.org)

### JOINT PROGRAMMING

4 April 2017, London (UK)

In the present schedule for the Joint Programming, the first call is planned for May 2018 for a submission in September 2018

To prepare the EC call for the Joint programming, a Programme Document Workshop is planned for the spring 2017, with probably other meetings in 2017

### H2020 EURATOM NEWS

BEACON workshop, 19-20 June 2017, Kaunas (Lithuania)



**BEACON** « Bentonite Mechanical Evolution » is a NFRP-6 Research and Innovation action (RIA) aiming at developing and testing the tools necessary for the assessment of the hydro-mechanical evolution of an installed bentonite barrier and its resulting performance. Coordinated by SKB (Sweden) with 24 partners (including LEI, Lithuania), it starts in June 2017 and will last 4 years.

For further information visit: [www.beacon-h2020.eu](http://www.beacon-h2020.eu)

DisCo kick-off meeting, 13<sup>th</sup> June 2017, Brussels (Belgium)



**DISCO** « Modern spent fuel dissolution and chemistry in failed container conditions » is also a NFRP-6 RIA which begins in June 2017 and for 4 years. The 16 beneficiaries (including PSI, Switzerland) coordinated by SKB (Sweden) will expand the database on spent fuel dissolution, as the standard spent uranium oxide fuel, the MOX as well as new types of fuels with additives ("doped fuels").

For further information visit: [www.disco-h2020.eu](http://www.disco-h2020.eu)



**THERAMIN** « Thermal treatment for radioactive waste minimisation and hazard reduction » examines the existing technologies and R&D in terms of thermal treatment so as to optimise the waste management lifecycle. Coordinated by VTT (Finland) with 11 other participants (including LEI, Lithuania); it is a NFRP-7 RIA of 3 years that starting in June 2017.

For further information visit: [cordis.europa.eu/project/rcn/210838\\_en.html](http://cordis.europa.eu/project/rcn/210838_en.html)

CHANCE kick-off meeting, 12<sup>th</sup> June 2017, Brussels (Belgium)



**CHANCE** « Characterization of conditioned nuclear waste for its safe disposal in Europe » is a 4 years-long NFRP-7 RIA starting in June 2017. It focusses on the characterization and quality control of the waste. The coordinator Andra (France) and 15 partners will establish a comprehensive understanding of characterization methods and quality control schemes for conditioned radioactive waste in Europe.

For further information visit: [www.chance-h2020.eu](http://www.chance-h2020.eu)