

NEA Workshop
on
Digital Safety Case Integration
for
Radioactive Waste and Geological Disposal
FINAL PROGRAMME

23-24 April 2025

Boulogne-Billancourt

General information

Location

Nuclear Energy Agency (NEA)

46, quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, France

Day 1 | 23 April 2025

Opening and Introduction of workshop

Chair: *Luca Abele Piciaccia, DSA, Workshop Programme Committee Chair*

9:30 **Opening remarks (10 min)**

Luca Abele Piciaccia, DSA, Workshop Programme Committee Chair

9:40 **Workshop introduction: EGSSC works and the outcome from the 1st Digital SC Workshop in 2022 (20 min presentation + 10 min Q&A)**

Shogo Nishikawa, OECD/NEA

Session 1: What does a holistic consideration of a digital safety case mean?

Chair: *Luca Abele Piciaccia, DSA, Workshop Programme Committee Chair*

10:10 **Creating a Digital Platform for Safety Case Development (20 min presentation + 10 min Q&A)**

Alexander Carter, NWS

10:40 **The digital general licence application (dRBG) Platform: A Centralized Digital Gateway to Nagra's Nuclear Waste Management (20 min presentation + 10 min Q&A)**

Mona Stockhecke, Nagra

11:10 **Break (20 min)**

11:30 **On attaining a safety case and maintaining it throughout the disposal site lifecycle in an environment with federated information systems and multiple stakeholders (20 min presentation + 10 min Q&A)**

Andrii Berezovskyi, OSLC Open Project co-chair, KTE Royal Institute of Technology

Session 2: How can digital technologies help coordinate configuration management for safety cases

Chair: *Olivier De Clercq, FANC, Workshop Programme Committee Member*

12:00 **Management of Knowledge Data for the Representative Preliminary Safety Assessment in the German Site Selection Procedure (20 min presentation + 10 min Q&A)**

Simone Tillmann, BGE

12:30 Lunch (90 min)

Session 3: Regulating safety in an increasingly digital world

Chair: *Olivier De Clercq, FANC, Workshop Programme Committee Member*

14:00 **Artificial Intelligence Preparedness – A Regulatory Perspective+ (20 min presentation + 10 min Q&A)**

Matt Dennis, U.S. Nuclear Regulatory Commission

Session 4: The developing role of systems engineering and requirements management

Chair: *Luca Abele Piciaccia, DSA, Workshop Programme Committee Chair*

14:30 **Modelling Nuclear Waste Management Programmes with Graph-based Discrete Simulation (GDS) (20 min presentation + 10 min Q&A)**

Andreas Poller, CSD Engineers

15:00 **NEUChain: Next Generation Digital Twin for Nuclear Energy System and AI-Based Knowledge Management System (20 min presentation + 10 min Q&A)**

Tomohiro Okamura, Institute of Science Tokyo

15:30 **Nagra's digital environment to manage post-closure safety and engineering requirements (20 min presentation + 10 min Q&A)**

Michael Köbberich, Nagra

16:00 Break (15 min)

Session 5: Discussion session

Facilitators:

Luca Abele Piciaccia; Alexander Carter; Olivier De Clercq; Jonathan Kindlein

16:15 **Introduction and Discussion**

Discussion topics:

- *Definition of a digital safety case: What is it? What are its benefits? What does it look like?*
- *Role of a digital safety case in regulatory interactions, and identified/potential issues in regulatory compliance.*
- *Flexibility of a digital safety case in adapting to changes in disposal programmes and requirements.*
- *Evolution of a digital safety case as disposal programmes progress. How to implement it at different stages?*

17:50 **Key takeaways from discussion**

18:10 **End of day remarks**

Luca Abele Piciaccia, DSA, EGSSC Chair

18:15 **End of day 1**

Cocktail Reception | BB Terrasse, NEA Premises | 18:30–19:45

Day 2 | 24 April 2025

Session 6: Relevant Developments in underlying domains (part 1)

Topics:

- Digital Inventory and waste package records
- Site characterisation
- Common data and modelling environments

Chair: *Alexander Carter, NWS, Workshop Programme Committee Member*

9:00 **Exploratory Machine Learning Approaches for Physico-Chemical Characterization (20 min presentation + 10 min Q&A)**

Ilker Makine, ONDRAF/NIRAS

9:30 **BGE's Repository Search Navigator – an interactive online platform for siting (20 min presentation + 10 min Q&A)**

Jonathan Kindlein, BGE

10:00 Break (15 min)

Session 7: Relevant Developments in underlying domains (part 2)

Topics:

- Digital engineering and BIM
- Linking research to the safety case
- Use for internal and external communication

Chair: *Jonathan Kindlein, BGE, Workshop Programme Committee Member*

10:15 **Integration of Advanced Digital Tools for the Realisation of an Optimised Repository in Switzerland (20 min presentation + 10 min Q&A)**

Alexandros Papafotiou, Nagra

10:45 **Digital Twin of Cigéo to support operating phase: goals, needs and work in progress (20 min presentation + 10 min Q&A)**

Guillaume Pepin, Andra

11:15 **From Data to Decisions: Digital Twins as the Cornerstone of Next-Generation Safety Management (20 min presentation + 10 min Q&A)**

Benjamin Girard, SPARTE

11:45 **Virtual and augmented reality as a cutting-edge technology for modelling of nuclear waste repositories (20 min presentation + 10 min Q&A)**

Kemal Yildizdag, BGE

12:15 Lunch (90 min)

Chair: *Ilker Makine, ONDRAF/NIRAS, Workshop Programme Committee Member*

13:45 **Development of Digital Technology for Building Smart Disposal Facility (20 min presentation + 10 min Q&A)**

Junsung Son, KORAD

14:15 **Enhancing User Access to Large Technical Documentations with LLMs (20 min presentation + 10 min Q&A)**

Mona Stockhecke, Nagra

Session 8: Moving toward a digital safety case

Chair: *Ilker Makine, ONDRAF/NIRAS, Workshop Programme Committee Member*

14:45 **Developing a Digital Safety Case Architecture for the Radioactive Waste Industry (20 min presentation + 10 min Q&A)**

James Grover, Capgemini

15:15 Break (15 min)

Session 9: Discussion session and conclusions

Facilitators:

Luca Abele Piciaccia; Alexander Carter; Olivier De Clercq; Jonathan Kindlein

15:30 **Introduction and Discussion**

Discussion topics:

- *What are the key steps in the transition to a digital safety case and associated challenges?*
- *How can we ensure integration and interoperability across all the disciplines and interoperability across all the tools used in the DGR project in a configuration managed environment?*
- *Potential role of AI and advanced digital technologies (ADT): Benefits, limitations, and constraints in future safety cases.
(E.g.: Interrogating large document collections; Digitizing paper records using an ontology; Supporting sensitivity analysis in model runs with advanced digital technologies; Assisting users in document writing; Pattern matching in site data)*
- *Information, data and knowledge management (IDKM) in digital safety cases: Managing legacy information, data, and knowledge.*

17:15 **Key takeaways from discussion**

17:45 **Summary of workshop and closing remarks**

Tara Beattie; Jenny Smallwood, MCM Environmental Services Ltd, Workshop rapporteur

Luca Abele Piciaccia, DSA, Workshop Programme Committee Chair

18:00 **End of Workshop**