

The Integration Group for the Safety Case (IGSC) Symposium 2018: Programme

Current Understanding and Future Direction for the Geological Disposal of Radioactive Waste

10-11 October 2018
Rotterdam
Netherlands



IGSC Safety Case Symposium 2018: Programme

Current Understanding and Future Direction for the Geological Disposal of Radioactive Waste

10-11 October 2018

Optional site tour: 12 October 2018

10 October Plenary session: La Fontaine Room
 Poster session and dinner: Odyssee Room

11 October Plenary session: La Fontaine Room
 Parallel sessions 8.1a, 8.2a, 8.3a: La Fontaine Room
 Parallel sessions 8.1b, 8.2b: Odyssee Room

Practical information

The meeting will be taking place in Rotterdam, Netherlands.

For further information regarding the logistics contact John Stein
(John.Stein@oecd-nea.org).

The workshop web page: www.oecd-nea.org/rwm/workshops/igsc2018.

Day 1 | Wednesday 10 October 2018

Symposium and Sessions 1-6 Chair: Lucy Bailey (IGSC Chair), RWM, United Kingdom

Session 1 – Opening remarks

- 8:45 1.1 Welcome from COVRA
J. Boelen, Managing Director, COVRA
- 8:55 1.2 Welcome from the NEA on behalf of the NEA, the EC and the IAEA
*G. Kwong, Acting Head of RWMD, to introduce
W.D. Magwood, IV, Director-General, NEA*
- 9:05 1.3 Welcome from the Symposium Chair and IGSC activities since 2013
L. Bailey, Symposium Chair

Session 2 – Keynote lecture 1: Safety case development in the Netherlands

- 9:20 2.1 Development of safety case in the Netherlands
E. Verhoef (COVRA, The Netherlands)
- 9:50 Coffee break (20 min)

Session 3 – Safety case and siting

- 10:10 3.1 Implementing deep geological disposal for Canada's used nuclear fuel – Status
N. Hunt (NWMO, Canada)
- 10:30 3.2 The ongoing Swiss site selection process: Current status, recent achievements and outlook, with special emphasis on the prominent role of safety
J. Schneider and P. Zuidema (Nagra, Switzerland)
- 10:50 3.3 Site selection process in the Czech Republic – Post-closure safety overview
A. Vokal (SÚRAO, Czech Republic)
- 11:10 3.4 Development of a generic safety case for the UK Geological Disposal Facility
L. Bailey and T.W. Hicks (RWM, United Kingdom)
- 11:30 3.5 Development of pre-siting SDM-based safety case – Overview
T. Fujiyama, K. Ota, S. Kubota, S. Suzuki, K. Fujisaki and H. Umeki (NUMO, Japan)
- 11:50 3.6 Deep geological disposal programme and the safety case development in China (*cancelled*)
S. Liu (CIAE, China)
- 12:10 3.7 A safety case report (AKRS-16) for the deep geological disposal of pyro-processing waste in Korea
J. Jeong, M. Hoon Baik, N. Y. Ko, and D. K. Cho (KAERI, Korea)
- 12:30 Lunch break (60 min)
- 13:30 3.8 General discussion for session 3 – All

Session 4 – Safety case and licensing

- 13:50 4.1 Current and next steps of the licensing of a KBS-3 repository in Sweden
A. Hedin, J. Andersson and K. Skagius (SKB, Sweden)
- 14:10 4.2 Life-cycle of a spent fuel disposal facility project – Licensing and authority actions in Finland
A. Luukkonen (STUK, Finland)
- 14:30 4.3 French safety options files “Cigéo-2015” and its review – A key milestone towards the safety case for the licensing of the future French DGR
S. Voinis, L. Griffault, M. Rabardy and S. Thabet (Andra, France)
- 14:50 4.4 The safety options dossier of the French Cigéo Project: Overview of the review by the IRSN
M. Rocher, M. Flachet, C. Espivent, G. Mathieu, F. Deleruyelle, A. De Hoyos, M. Tichauer, and D. Pellegrini (IRSN, France)
- 15:10 4.5 General discussion for session 4
All
- 15:30 Coffee break (20 min)

Session 5 – Keynote lecture 2

- 15:50 5.1 Safety case in non-RWM facility
W. Weiss (CRPPH)

Session 6 – Safety case and non-technical stakeholder

- 16:20 6.1 The Belgian partnership approach, also for the safety case for surface disposal
E. Hoofst, G. Sannen and S. Eeckhout (ONDRAF/NIRAS, Belgium)
- 16:40 6.2 Applying the optimisation principle to the choice of the host rock for geological disposal: Ethical and epistemological dimensions
C. Kermisch and C. Depaus (ONDRAF/NIRAS, Belgium)
- 17:00 6.3 Safety case and transdisciplinary research
K.J. Röhlrig (TUC, Germany), A. Eckhardt (risicare GmbH, Switzerland) and P. Hocke (KIT-ITAS, Germany)
- 17:20 6.4 National consultations concerning licence application for construction and operation of a repository for spent nuclear fuel in Sweden: Overview of viewpoints and role in regulatory review
B. Strömberg, M. Egan and C.H. Pettersson (SSM, Sweden)
- 17:40 6.5 An anthropological perspective on the siting process for a GDF in England: Values and worldviews amongst stakeholders in West Cumbria
P.T. Kalshoven (University of Manchester, United Kingdom)
- 18:00 6.6 General discussion for session 6
All

Poster session and symposium dinner*

- P1** An initial safety case for a geological disposal facility in the Boom Clay of the Netherlands
E.V. Verhoef, E.A.C. Neeft, N.A. Chapman and C. McCombie (COVRA, Netherlands)
- P2** Research planning: The Dutch OPERA safety case for disposal in clay
J.B. Grupa and T.J. Schröder (NRG, Netherlands)
- P3** Safety assessment: The Dutch OPERA safety case for disposal in clay
J.B. Grupa and J. Hart (NRG, Netherlands)
- P4** Scenario development: The Dutch OPERA safety case for disposal in clay
J. Grupa (NRG, Netherlands) and T. Wildenborg (TNO, Netherlands)
- P5** Interaction between process-level modelling and performance assessment: The Dutch OPERA safety case for disposal in clay
J.C.L. Meeussen, J.B. Grupa, J. Hart and T.J. Schröder (NRG, Netherlands)
- P6** OPERA performance assessment results for disposal in Boom Clay
J. Hart, J.C.L. Meeussen, J.B. Grupa, E. Rosca-Bocancea and T.J. Schröder (NRG, Netherlands)
- P7** OPERA – Assessment of long-term radiological impact of disposed depleted uranium
T.J. Schröder, E. Rosca-Bocancea and J. Hart (NRG, Netherlands)
- P8** Evaluation of current knowledge for building the Dutch safety case for a disposal concept in rock salt
J. Hart (NRG, Netherlands), J. Prij (NRG, Netherlands), T.J. Schröder (NRG, Netherlands), G.J. Vis (TNO, Netherlands), D-A. Becker (GRS, Germany), J. Wolf (GRS, Germany), U. Noseck (GRS, Germany) and D. Buhmann (GRS, Germany)
- P9** Communicating safety case results: The Dutch OPERA safety case for disposal in clay
T.J. Schröder (NRG, Netherlands) and E. Jelgersma (Sherpa & De Fries, Netherlands)
- P10** Retrievability and surveillance of radioactive waste disposals
T.J. Schröder, J. Hart, and E. Rosca-Bocancea (NRG, Netherlands)
- P11** EU projects: The Dutch OPERA safety case for disposal in clay
J.B. Grupa (NRG, Netherlands)
- P12** Integration of CAST results to safety assessment – probabilistic uncertainty/sensitivity analysis of C-14 release and transport
J. Hart, J.J. Dijkstra and J.C.L. Meeussen (NRG, Netherlands)
- P13** Towards a Dutch safety case in rock salt
J. Bartol (COVRA, Netherlands)
- P14** The new site selection procedure in Germany and corresponding evolving safety cases
N. Schubarth-Engelschall and J. Wollrath (BGE, Germany)
- P15a** Development of a pre-siting SDM-based safety case – Site characterisation and synthesis into SDMs
K. Ota, H. Saegusa, H. Kondo, J. Goto, T. Kunimaru and S. Yamada (NUMO, Japan)
- P15b** Development of pre-siting SDM-based safety case – Post-closure safety assessment
K. Fujisaki, K. Ishida, T. Hammoto, S. Shibusaki, K. Ishiguro and H. Umeki (NUMO, Japan)

* Presenters are encouraged to stand by the poster between 19:00-20:00.

Poster session and symposium dinner (cont'd)

- P16** Current status of DGR development in Ukraine
B. Zlobenko (Institute of Environmental Geochemistry National Academy of Science, Ukraine)
- P17** Current and next steps of the licensing of a KBS-3 repository in Sweden – Some details
A. Hedín, J. Andersson and K. Skagius (SKB, Sweden)
- P18** Geological-hydrogeological and transport modelling of Czech potential DGR sites
L. Vondrovic, A. Vokál and M. Vencl (SÚRAO, Czech Republic)
- P19** Radionuclide Source Term Inter-Comparison Study: GDSA Framework and RepoTREND
J.M. Frederick, E.R. Stein and S.D. Sevougian (SNL, United States)
- P20** Natural analogue studies: A strategy for bridging the spatial-temporal gap in demonstrating long-term safety.
J.L. Brown (CNSC, Canada), M. Fayek (University of Manitoba), M.N. Herod (CNSC, Canada) and T.S. Nguyen (CNSC, Canada)
- P21** GDSA framework: Comparison of sensitivity analysis methods applied to a reference case repository in shale
E.R. Stein, L.P. Swiler and S.D. Sevougian (SNL, United States)
- P22** Performance assessment of a reference nuclear waste repository in fractured crystalline rock: Connected vs. unconnected fracture networks
P.E. Mariner, E.R. Stein, S.D. Sevougian and E. Basurto (SNL, United States)
- P23** Update on R&D for direct disposal of dual-purpose canisters
E.L. Hardin, P.V. Brady, P.N. Swift and E.J. Bonano (SNL, United States)
- P24** The NEA FEP Database
A.J. Carter and M. Ciambrella (IGSC FEP TG)
- P25** 2017 recertification of the Waste Isolation Pilot Plant
R.T. Peake, E.F. Santillan, I. Rosencrantz, D. Schultheisz, K. Economy, E. Felcorn, R. Joglekar and J. Walsh (EPA, United States)
- P26** Requirements for safe closure of the deep disposal facilities for liquid radioactive waste in Russia
A.V. Ponizov and D.A. Boldyreva (SEC NRS, Russia)
- P27** Regulatory development for intermediate depth disposal of radioactive waste in Japan
H. Aoki, N. Yamada and T. Maeda (NRA, Japan)
- P28** The VISI System
O. Hall, L.E.F. Bailey, A.J. Carter and T. Hicks (RWM, United Kingdom)
- P29** The safe closure of the NPD reactor
M. Vickerd and G. Porter (Canadian Nuclear Laboratories, Canada)
- P30** Sensitivity analysis and performance targets as a tool to guide RD&D of a geological disposal in poorly indurated clays
M. Capouet, C. Depaus and E. Dorado (ONDRAF/NIRAS, Belgium)
- P31** A comparison between the Posiva's FEP list and the updated NEA IFEP list
A. Kontula (Posiva, Finland), P-G. Åstrand (ÅF consult, Finland), T. Hjerpe (ÅF consult, Finland) and B. Pastina (Posiva, Finland).

Day 2 | Thursday 11 October 2018

Session 7 Chair: Lucy Bailey (IGSC Chair), RWM, United Kingdom; **Session 8.1a Chair:** Doug Ilett, EA, United Kingdom; **Session 8.1b Chair:** Evaristo J. Bonano, SNL, United States and Johan Andersson, SKB, Sweden; **Session 8.2a Chair:** Klaus Röhlrig, TUCIZ, Germany and Christophe Davies, EC; **Session 8.2b Chair:** Manuel Capouet, ONDRAF/NIRAS, Belgium; **Session 8.3a Chair:** Wilhelm Bollingerfehr, BGE TECHNOLOGY, Germany; **Session 9 Facilitator:** Ulrich Noseck, GRS, Germany

Session 7 – International developments since 2013

- 8:30 7.1 An update on IAEA initiatives on safety case development
A. Orrell (IAEA)
- 8:50 7.2 Towards a European Joint Research Programme on radioactive waste management
C. Davies (EC)
- 9:10 Break (10 min)

Session 8 – Parallel session

Session 8.1a – Regulatory challenges in safety case review		Session 8.1b – Safety case and R&D	
9:20	8.1a-1 Developing a joint safety case review framework: Achievements within SITEX II EC project <i>F. Bernier (FANC, Belgium), J.P. Wouters (FANC, Belgium) and D. Pelligrini (IRSN, France)</i>	8.1b-1	OPERA – Vision from the Dutch Technical Support Organisation <i>A.D. Poley and J. Hart (NRG, Netherlands)</i>
9:40	8.1a-2 Regulatory research in support of the review of safety cases for geological disposal <i>T.S. Nguyen, J.L. Brown, E. Dagher, G. Su and Q. Zheng (CNSC, Canada)</i>	8.1b-2	OPERA – Prediction of Kd values for radionuclides in Boom Clay with an independent multi-surface model <i>J.C.L. Meeussen, T.J. Schröder and J. Grupa (NRG, Netherlands)</i>
10:00	Coffee break (20 min)		
10:20	8.1a-3 Selected regulatory challenges of the safety case at the Waste Isolation Pilot Plant <i>R.T. Peake, I. Rosencrantz, D. Schultheisz, E.F. Santillan and J. Walsh (EPA, United States)</i>	8.1b-3	Methodological safety case for the Belgian geological disposal facility for category B&C waste <i>W. Wacquier, M. Van Geet, X. Sillen and M. Capouet (ONDRAF/NIRAS, Belgium)</i>
10:40	8.1a-4 Conceptual intercourse: Experiences in communicating an environmental safety case for an operational facility <i>S. Stead (LLW Repository Ltd., United Kingdom)</i>	8.1b-4	R&D support of Czech safety case development <i>V. Havlova (UJV Rez, Czech Republic) and A. Vokal (SÚRAO, Czech Republic)</i>

Session 8.2a – International co-operation for research: Role and added value

Session 8.1b – Safety case and R&D (cont'd)

- 11:00 8.2.a-1 Reference thermodynamic data for modelling of deep geological repositories: The NEA Thermochemical Database Project
M.E. Ragoussi and J. Martínez, (NEA)
- 11:20 8.2.a-2 The IGSC Crystalline Club: Sharing innovative solutions for DGRs in hard rocks
L. Vondrovic, J. Flügge, M.I. Yamada, P.E. Mariner, A. Talitskaya, S. Hirshorn, A. Ionescu and I. Blechschmidt (Crystalline Club, NEA)
- 11:40 8.2.a-3 GEOSAF II Task Group on Operational Safety
C. Depaus, K. Skagius, G. Buckau and F. Svensson (IAEA)
- 12:00 Lunch break (60 min)
- 13:00 8.2.a-4 Sensitivity analysis in performance assessment: Towards a joint approach
D.A. Becker (GRS) B.J. Debusschere (SNL), J. Govaerts (SCK•CEN), L. Koskinen (Posiva), P. Kupiainen (Posiva), C.D. Leigh (SNL), P.E. Mariner (SNL), O. Nummi (Fortum), B. Pastina (Posiva), E. Plischke (TUC), K.J. Röhlig (TUC), S.D. Sevougian (SNL), S. Spieß (GRS), E.R. Stein (SNL), L.P. Swiler (SNL), E. Weetjens (SCK•CEN) and T. Zeitler (SNL)

- 8.1b-5 Safety case for deep borehole disposal of SNF and HLW
G. Freeze and B. MacKinnon (SNL, United States)
- 8.1b-6 GDSA Framework: High-performance safety assessment software to support the safety case
S.D. Sevougian, G.E. Hammond, P.E. Mariner, E.R. Stein, J.M. Frederick, and R.J. MacKinnon (SNL, United States)
- 8.1b-7 Improving DGR System understanding by probabilistic sensitivity analyses
T.U. Kaempfer (Nagra, Switzerland), A. Poller and G. Mayer (CSD Engineers, Switzerland)
- 8.1b-8 Development of a probabilistic insight model for assessing post-closure safety of a UK Geological Disposal Facility
D.S. Rackstraw, L.E.F. Bailey and M.J. Poole (RWM, United Kingdom)
- 8.1b-9 Andra's approach for definition of post-closure scenarios in the "2015 French Safety Options Dossier" of Cigéo
L. Griffault, S. Voinis, S. Thabet and S. Soulet (Andra, France)

Session 8.3a – Operational safety and its influence on post-closure safety

- 13:40 8.3a-1 WIPP performance assessment: Effects of an operational incident on long-term repository performance
B.A. Day, T.R. Zeitler, J. Bethune and R. Sarathi (SNL, United States)
- 14:00 8.3a-2 Operational safety impacts on the design of the Belgian geological disposal facility for B&C wastes
D. Leonard, W. Wacquier and D. Raymaekers, (ONDRAF/NIRAS, Belgium)

- 8.1b-10 Special features of the Russian research programme in URL
A. Dorofeev, I. Linge, S. Utkin, E. Saveleva and V. Krasilnikov (IBRAE, Russia)
- 8.1b-11 The NEA International FEP List 3.0
A.J. Carter and M. Ciambrella (IGSC FEP TG)

Session 8.3a – Operational safety and its influence on post-closure safety (cont'd)

Session 8.2b – Information management

14:20	8.3a-3	Demonstration of operational and long-term safety of geological disposal: the IAEA's GEOSAF project <i>T.S. Nguyen (CNSC), A. Luukkonen (STUK), A. Guskov (IAEA), C. Depaus (ONDRAF/NIRAS), C. Espivent (IRSN), B. Hedberg (SSM), M. Tichauer (IRSN) and J. Wollrath (BGE)</i>	8.2b-1	Production of a digital safety case <i>A.J. Carter, L.E.F. Bailey and O.A. Hall, (RWMM, United Kingdom)</i>
14:40		Coffee break (20 min)		
15:00	8.3a-4	WIPP Events and the lasting impact <i>S. Dunagan (SNL, United States)</i>	8.2b-2	Developing safety case content management systems – from traditional documentation towards a database <i>H. Reijonen, D. McKie and B. Pastina (Posiva, Finland)</i>
15:20	8.3a-5	Performance monitoring and retrievability of emplaced high-level radioactive waste and spent nuclear fuel in geologic repositories <i>B. Leslie and R. Pabalan (Nuclear Waste Technical Review Board, United States)</i>	8.2b-3	Challenge on development of the JAEA KMS (Knowledge Management System) <i>H. Makino, T. Semba and M. Shibata (JAEA, Japan)</i>
15:40	8.3a-6	Development of a pre-siting SDM-based safety case – Assessment of operational hazards and an application to vehicle fire in underground facility <i>S. Suzuki, N. Katsumata, D. Riechelmann, S. Kawakami and S. Kubota (NUMO, Japan)</i>	8.2b-4	Metadata and its use in the development of robust safety cases for geological disposal <i>M. Ciambrella and A.J. Carter (RepMet group)</i>
16:00	8.3a-7	Investigation of the impacts of the operational phase on post-closure safety by a FEP analysis <i>J. Wolf (GRS, Germany)</i>	8.2b-5	Preservation of Records, Knowledge and Memory (RK&M) – Supporting the safety of radioactive waste disposal facilities across generations. Findings of the NEA RK&M Initiative <i>A. Berckmans and J. Schröder (RK&M group)</i>
16:20		Break (20 min)		

Session 9 – General discussion

16:40	9.1	Feedback from session rapporteurs (5 min per session) <i>Session rapporteurs</i>
17:20	9.2	Discussion on key points and future issues on safety case <i>All</i>

Session 10 – Symposium closure

18:00	10.1	Chairperson's closing remarks <i>L. Bailey, Symposium Chair</i>
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