

PROGRAMME



Global Forum on Nuclear Science, Technology and Policy

*Country-Specific Workshop:
Encouraging Greater Cohesion of
Social Sciences and STEM to Push
the Nuclear Sector Forward*

17-18 October 2023
SNU Faculty Club
Seoul National University (SNU)
Seoul, Korea

NEA Global Forum on Nuclear Science, Technology and Policy

In recent years, the Nuclear Energy Agency (NEA) has developed its work with member countries in the area of education and capacity building. At the centre of these efforts is the NEA Global Forum on Nuclear Education, Science, Technology and Policy (the “Global Forum”), which builds sustained co-operation among academic institutions in nuclear science and technology. Since 2021, the Global Forum has used creative problem-solving to confront some of the most significant challenges in nuclear education and human capacity. More information related to the Global Forum can be found online here: www.oecd-nea.org/jcms/pl_57917.

Country-specific workshops

As one of the various instruments of the Global Forum, the country-specific workshop enables dialogue between academia, government and industry to overcome barriers in nuclear education and to outline scenarios for the future of the nuclear sector in a specific country.

Topical background

From the early days of commercial nuclear power some 70 years ago, the nuclear energy sector has responsibly and sustainably addressed the entire life cycle of its material and potential impacts. Policymakers and scientists at the national and international levels have taken into full consideration the present and future generations by proposing, studying and implementing the safe disposal of spent nuclear fuel (SNF) and high-level waste (HLW). There is a scientific consensus today that deep geological repositories (DGRs) are safe and effective for the permanent disposal of SNF/HLW. However, while DGR development and implementation require competencies in science and engineering, socio-political aspects are also key. Government plays an important role not only in identifying legal, safety, security compliance and technical issues to be addressed, but also in promoting communication and engagement with stakeholders, and in supporting research and development (R&D) programmes.

Skill sets needed to develop and maintain a DGR programme

To successfully develop and operate a DGR, an interdisciplinary educational programme is required. In general, development of a DGR requires the following types of experts:

- Earth and physical scientists to study and identify a suitable site for safe disposal by investigating a variety of host rocks (geology, hydrology, etc.);
- Engineering experts to support the development of the safety case (civil, nuclear, chemical, mechanical); and
- Economists, lawyers, political scientists, and social scientists to support the development of a national policy and regulatory framework, and to identify strategies for engaging all stakeholders and ways in which to create added value for the host community. These fields also collectively support the communication of uncertainties and other technical challenges related to establishing a DGR.

Through this holistic and interdisciplinary process, it is possible to construct and develop a decision-making process that encompasses all aspects of DGR development.

Overall objective of the workshop

The workshop aims to bring together international experts in the areas of safety case development, stakeholder engagement, regulation, and government to discuss their experience developing DGRs: the challenges faced, the way interdisciplinary teams can support work, and ideas for further developing educational curricula.

Agenda – 17 October 2023

Opening session

9:00-9:45

Welcome remarks

Yoo Suk Hong, Dean, College of Engineering, Seoul National University (SNU), Korea

Opening remarks

Sungyeol Choi, Workshop Chair and Head, Integrated Major in Sustainable High-level Radioactive Waste Management, SNU, Korea

Sung Don Cho, CEO, Korea Radioactive Waste Agency (KORAD), Korea

Tatiana Ivanova, Head of Nuclear Science and Education Division, NEA

9:45-10:00

Break

Session 1: Assessing needs of Korean stakeholders in developing sustainable nuclear cycle back-end strategies

10:00-12:00

Chair: *Rebecca Tadesse, Head of Radioactive Waste Management and Decommissioning Division, NEA*

Presenters

Nayoung Lee, President, Korea Institute of Nuclear Nonproliferation and Control (KINAC), Korea

Jin Yong Park, Manager, Department of Radioactive Waste Disposal Regulations, Korea Institute of Nuclear Safety (KINS), Korea

Dong-Geon Cho, Vice President for Spent Nuclear Fuel Storage and Disposal Technology Development Group, Korea Atomic Energy Research Institute (KAERI), Korea

Haeryong Jung, Team Head, Disposal Technology Team, KORAD, Korea

Yong Deog Kim, Group Leader, Spent Nuclear Fuel Management, Korea Hydro & Nuclear Power – Central Research Institute (KHNP-CRI), Korea

Byung-Gon Chae, Deep Subsurface Storage and Disposal Research Center, Korea Institute of Geoscience and Mineral Resources (KIGAM), Korea

So Young Kim, Professor, Graduate School of Science and Technology Policy, Korea Advanced Institute of Science & Technology (KAIST), Korea

Roundtable discussion

- Skills and number of experts required by industry and key stakeholders
- Continuing education
- Funding research opportunities and training programmes
- Capacity building, internships, hands-on trainings, potential career opportunities for students

12:00-13:30

Lunch

Session 2: Curriculum of radioactive waste management at Korean universities

13:30-15:30 **Chair:** Youkwang Kim, Vice President, HLW Project Division, KORAD, Korea

Presenters

Sungyeol Choi, Workshop Chair and Head, Integrated Major in Sustainable High-level Radioactive Waste Management, SNU, Korea

Jong-Il Yun, Professor, Department of Nuclear and Quantum Engineering, KAIST, Korea

Jaeyeong Park, Associate Professor, Department of Nuclear Engineering, Ulsan National Institute of Science and Technology (UNIST), Korea

Jae Hak Cheong, Professor, Department of Nuclear Engineering, Kyung Hee University, Korea

Yongheum Jo, Assistant Professor, Department of Nuclear Engineering, Hanyang University, Korea

Jun-Yeop Lee, Associate Professor, Department of Mechanical Engineering (NE Program), Pusan National University, Korea

Jong Soon Song, Professor, Department of Nuclear Engineering, Chosun University, Korea

Roundtable discussion

- University-level capacity to train students in radioactive waste management
- Support required and received from nuclear stakeholders
- Ensuring interdisciplinary education and incorporating STEM with social sciences and earth sciences
- Practice and possibilities for Korean students to develop their academic and professional careers internationally
- Capacity of Korean universities to train foreign students in radioactive waste management

15:30-15:45 Break

Session 3: Curriculum of radioactive waste management at foreign universities

15:45-17:45 **Chair:** Kwangheon Park, Professor of Nuclear Engineering, Kyung Hee University, Korea

Presenters

Rebecca Abergel, Associate Professor, Department of Nuclear Engineering, UC Berkeley, United States
Akira Kirishima, Professor, Center for Mineral Processing and Metallurgy (CMPM), Tohoku University, Japan

Todd Allen, Professor, Nuclear Engineering & Radiological Sciences, University of Michigan, United States

Pascal Claude Leverd, Institute for Korea Spent Nuclear Fuel, Korea; on leave from ANDRA, France

Clint Sharrad, Professor, Chemical Engineering & Analytical Science Department, University of Manchester, United Kingdom

Roundtable discussion

- University-level capacity to train students in radioactive waste management
- Support required and received from nuclear stakeholders
- Ensuring interdisciplinary education and incorporating STEM with social sciences and earth sciences
- Practice and possibilities for students to develop their academic and professional careers internationally
- Capacity of universities to train foreign students in radioactive waste management

18:30-20:30 Dinner

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Session 4: Converging education between STEM and the social sciences

9:00-11:00 **Chair:** Eun-Hee Kim, Professor of Nuclear Engineering, SNU, Korea

Presenters

Pilhyeon Ju, Graduate Student, Department of Nuclear Engineering, SNU, Korea

Hye-Sun Yoon, Professor, School of Law, Hanyang University, Korea

Todd Allen, Professor, Nuclear Engineering & Radiological Sciences, University of Michigan, United States

Robbe Geysmans, Sociologist, SCK•CEN, Belgium

Sylvia Saltzstein, Senior Manager, Nuclear Fuel Cycle Technologies, Sandia National Laboratories, United States

Haruko M. Wainwright, Professor, Nuclear Science & Engineering, Massachusetts Institute of Technology (MIT), United States

Roundtable discussion

- Scope of social sciences in radioactive waste management
- How to integrate a multidisciplinary group of professors into development of a curriculum
- Further integration of STEM with social sciences on radioactive waste management

11:00-11:15 Break

Session 5: Panel discussion: building up the workforce to support fuel cycle back-end development

11:15-12:45 **Chair:** Mansung Yim, Professor of Nuclear Engineering, KAIST, Korea

Panelists

Soohyung Lee, Graduate School of International Studies, SNU, Korea

Seong-Ki Lee, KEPCO Nuclear Fuel, Korea

Won Pyo Jeong, Korea Nuclear International Cooperation Foundation, Korea

Eun-Young Choi, Advanced Fuel Cycle Technology Division, KAERI; Department of Nuclear Science and Technology, University of Science and Technology (UST), Korea

Tetsuo Fujiyama, Science and Technology Department, Nuclear Waste Management Organisation of Japan (NUMO), Japan

Peter Wass, Chief Projects Development Officer, SKB, Sweden

Jongjin Kim, Manager, Human Resource Development Institute for Radioactive Waste Technology (HRD), KORAD, Korea

Roundtable discussion

- Identifying challenges faced in building up a workforce to support fuel cycle back-end development
- Identifying the steps already taken to address these challenges and the strategies that have been successful

12:45-14:00 Lunch

Session 6: Roundtable discussion: inspiring future curriculum development

14:00-15:30 **Chair:** Mansung Yim, Professor of Nuclear Engineering, KAIST, Korea
All participants

15:30-15:45 Break

Session 7: Wrap up of the workshop and next steps

15:45-17:15 **Chair:** Tatiana Ivanova, Head of Nuclear Science and Education Division, NEA
Summary of the workshop: NEA Secretariat
Roundtable discussion on follow-up synergetic co-operation – All participants

17:15-17:30 **Closing remarks**
Sungyeol Choi, Workshop Chair and Head, Integrated Major in Sustainable High-level Radioactive Waste Management, SNU, Korea
Rebecca Tadesse, Head of Radioactive Waste Management and Decommissioning Division, NEA

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Nuclear Energy Agency (NEA)
46, quai Alphonse Le Gallo
92100 Boulogne-Billancourt, France
Tel.: +33 (0)1 73 21 28 19
nea@oecd-nea.org www.oecd-nea.org

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