

Enlarged Halden HTO Programme Review Group (EHPRG) meeting 2025

Technical program. For more info: <https://ife.no/en/event/enlarged-halden-programme-review-group-meeting-ehprg-2025/>

Monday 5 th May			
08:30 – 11:30	Paper No.:	Opening session Future needs of the nuclear industry	Chair: Kenichi Hayase, CRIEPI Secretary: Andreas Bye
08:30-08:40	Mo-00	Welcome and Introduction	Andreas Bye , IFE. Programme Manager, Halden HTO Project
08:40-08:50	Mo-01	Welcome and CRIEPI activities	Kenichi Hayase CRIEPI
08:50-09:10	Mo-02	NEA initiatives and perspectives on the future of the nuclear industry	Nina Cromnier , Radiological Protection and Human Aspects of Nuclear Safety, OECD Nuclear Energy Agency
09:10-09:30	Mo-03	Future needs of the U.S. nuclear industry, DOE programs and efforts	Bruce Hallbert , Idaho National Laboratory
09:30-09:50	Mo-04	UK nuclear industry – opportunities and challenges	Jonathan Hyde , UK National Nuclear Laboratory
09:50-10:05	Mo-05	The energy and nuclear situation in Norway	Bjørn Axel Gran , Research Director, IFE
10:05-10:30		Coffee break	
10:30-10:50	Mo-06	Regulatory perspective on the future of nuclear in the U.S.	Brian Smith , Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission
10:50-11:10	Mo-07	Overview of Activities Regarding Human Factors of NRA	Mitsuhiro Takanashi , Nuclear Regulation Authority of Japan, NRA
11:10-11:30	Mo-08	Swedish nuclear developments and regulatory views	Johan Enkvist , Swedish Radiation Safety Authority
11:30-13:00		Lunch	

13:00-15:40		Topic 3: Control Room Design & Evaluation	Chair: Fei Song, SNERDI Secretaries: Hanne Rødsethol, Hoa T. Nguyen	Ref.:
13:00-13:30	Mo-3-1	Keynote address: LWRs Plant Modernization Research and Accomplishments	Bruce Hallbert, INL	
13:30-13:50	Mo-3-2	“What is going on in the plant” - An initial investigation of situation awareness in nuclear process control	Per Øivind Braarud , Gyrd Skraaning Jr., Espen Nystad, IFE	HTOR-093
13:50-14:10	Mo-3-3	DPC - Digital Plant Companion - Challenges to a Nuclear Specific Operating Support System	Nico Schuster , Eric Corrieri, Wolfgang Krause, Framatome	Paper
14:10-14:30	Mo-3-4	Insights into Overview Display Usage with Biometric Head-Tracking in Control Rooms	Jens Patrick Langstrand , Hoa T. Nguyen, IFE	HTOR-099
14:30-15:00		Coffee Break		
15:00-15:20	Mo-3-5	Displays for multi-unit supervision on the HSMR simulator	Lars Hurlen , Hanne Rødsethol, Daniel Odéen, Håkon Jokstad, Rob McDonald, IFE	HTOR-087
15:20-15:40	Mo-3-6	Virtual Reality for NPP Control Room Operator Training and Early System Validation – Qualitative Assessment of Virtual Control Room Simulator	Michael N. Louka , Sathiya K. Renganayagalu, Peter Christopher Bach, Edward Langstrand, IFE	HTOR-092
15:40-16:20		Topic 4: Human-Automation Collaboration and Multi-Unit Operation	Chair: Kelly Dickerson, NRC Secretaries: Jan Erik Farbrot, Salvatore Massaiu	Ref.:
15:40-16:00	Mo-4-1	Control room operators’ task load in current operations	Asgeir Drøivoldsmo , Kine Reegård, Jan Erik Farbrot, IFE	HTOR-090
16:00-16:20	Mo-4-2	Application of Adaptive Automation in Control room Procedure Work – Insights from Empirical Studies with a Prototype System	Rossella Bisio , Marten Bloch, IFE	HTOR-051
16:30-18:30		Exhibitions and Demonstrations		
19:00-19:30		Refreshments		
19:30		Seated Dinner		

Tuesday 6 th May				
08:30-11:30		Topic 4: Human-Automation Collaboration and Multi-Unit Operation, continued	Chair: Kelly Dickerson, NRC Secretaries: Jan Erik Farbrot, Salvatore Massaiu	Ref.:
08:30-09:00	Tu-4-3	Keynote address: Human Performance Data Collection Activities for Small Modular Reactors: Human Factors and Reliability Considerations.	Jinkyun Park, KAERI; Maren H. Rø Eitrheim, Awwal Arigi, IFE; Kelly Dickerson, Niav Hughes Green, NRC; Ronald Laurids Boring, INL	Paper
09:00-09:20	Tu-4-4	A Simulator-based Experiment for Human Reliability in Multi-unit and Digitalized Control Environments	Yochan Kim, KAERI; Tae Ryoum Kim, KAIST; Wooseok Jo, UNIST; Jonghyun Kim, KAIST; Seung Jun Lee, UNIST; Jinkyun Park, KAERI	Paper
09:20-09:40	Tu-4-5	Multi-unit operation of Small Modular Reactors: Impacts of two staffing configurations on human performance	Maren H. Rø Eitrheim, Awwal M. Arigi, Robert McDonald, IFE; Greg A. Jamieson, UoT	HTOR-096
09:40-10:00	Tu-4-6	Investigating HRA needs for new advanced reactors: a literature survey and expert perspectives	Awwal M. Arigi, IFE	HTOR-086
10:00-10:30		Coffee break		
10:30-10:50	Tu-4-7	Reviewing and Rethinking Automation Transparency	Greg A. Jamieson, UoT; Gyrd Skraaning Jr., IFE	HTOR-085
10:50-11:10	Tu-4-8	Operator Responses to Systemic Automation Failure: 2nd HAMMSAT Experiment	Gyrd Skraaning Jr., Daniel Odéen, IFE; Greg A. Jamieson, UoT	HTOR-088
11:10-11:30	Tu-4-9	Enabling flexibility for PWR thanks to the OAPS system, Real time predictive system for flexible operation, HFE aspects	Eric Corrieri, Rami Abel, Victor Baisnée, Alain Grossetête, Guillaume Dupre, Framatome	Paper
11:30-13:00		Lunch		

13:00-14:30		Topic 5: Digital Systems for Operations and Maintenance	Chair: Spencer Brown, FANR Secretaries: Emil Wingstedt, John Einar Hulsund	Ref.:
13:00-13:30	Tu-5-1	Keynote address: AI to Improve Efficiency and Safety in Nuclear Power Plants	Ahmad Y. Al Rashdan, INL	
13:30-13:50	Tu-5-2	Digital Twins in the Nuclear Industry: Insights from a Review of Standards and Industry Survey	Sathiya K. Renganayagalu, Harald P-J Thunem, IFE	HTOR-095
13:50-14:10	Tu-5-3	Maintenance Optimization for NPPs: Methods for identifying the validity and scope of AI/ML models	Mario Hoffmann, Hans Olav Randem, Terje Bodal, IFE	HTOR-097
14:10-14:30	Tu-5-4	Harmonizing nuclear industry and outage safety culture: A model and illustration of systemic influences	Prosper A. Kwei-Narh, Rob McDonald, Daniel Odéen, IFE	HTOR-081
14:30-15:00		Coffee Break		
15:00-16:55		Topic 1: Human Performance	Chair: Jinkyun Park, KAERI Secretaries: Michael Hildebrandt, Awwal Arigi	Ref.:
15:00-15:45	Tu-1-1	Keynote address: So what? A talk on how we can focus on what matters for people on a nuclear site.	Richard Screeton, ONR	
15:45-16:15	Tu-1-2	Experiences and Findings of Human Performance in a Digital Control Room.	Fei Song, Huiyun Wang, Qiuyu Wang, Zheng Zhi, Shuhui Zhang, SNERDI	HTOR-083
	Tu-1-3	Operating Experiences of the Computerized Operating Procedure System.	Fei Song, Xiaohua Feng, Qiuyu Wang, Zheng Zhi, Jun Ma, SNERDI	HTOR-084
16:15-16:35	Tu-1-4	Impact of crew brief on crew dynamics and performance - Findings from a HAMMLAB study	Magnhild Kaarstad, Rob McDonald, Daniel Odéen, IFE	HTOR-094
16:35-16:55	Tu-1-5	Workshop on crew dynamics and cognitive dependency	Kelly Dickerson, NRC; Magnhild Kaarstad, IFE	HTOR-101 in press
17:00-19:00		Exhibitions and Demonstrations		
19:00-21:00		Buffet Dinner		

Wednesday 7 th May				
08:30-09:10		Topic 1: Human Performance, continued	Chair: Jinkyun Park, KAERI Secretaries: Michael Hildebrandt, Awwal M. Arigi	Ref.:
08:30-08:50	We-1-6	Adaptive decision-making in control room emergencies: Results of a HAMMLAB study with the GPWR simulator	Salvatore Massaiu, IFE	HTOR-039
08:50-09:10	We-1-7	Learning from event failures: Identifying success to resolve two pertinent issues	Prosper A. Kwei-Narh, Awwal M. Arigi, Rossella Bisio, IFE	HTOR-082
09:10-10:20		Topic 2: Digital I&C – Safety Assurance	Chair: Jacoline Hanekom, NRG Secretaries: Rune Fredriksen, Sizarta Sarshar	Ref.:
09:10-09:40	We-2-1	Keynote address: From abstract performance-based regulatory requirements to verifiable engineering requirements: Some approaches to address the challenges	Sushil Birla, U.S. NRC	
09:40-10:00	We-2-2	Workshop Series on Safety of Digital Systems - Proceedings 2024	Coralie Esnoul, Peter Karpati, Charlotte Vrangund, IFE	HTOR-075
10:00-10:20	We-2-3	Update on the state-of-the-art for safety of Digital Systems	Coralie Esnoul, Peter Karpati, Bjørn Axel Gran, IFE	HTOR-074
10:20-10:50		Coffee break		
10:50-13:00		Special session: Integrated Operations for Nuclear and Petroleum	Chair: Bruce Hallbert, INL Secretary: Asgeir Drøivoldsmo	
10:50-11:45	We-IO	Short introduction by panellists, presentations sharing key insights and experiences <ul style="list-style-type: none"> Cost Reduction Trough Integrated Operations – Lessons from oil&gas on cutting operational and maintenance costs through IO-driven efficiencies. Key takeaways for nuclear 	Panellists: Sherman Jason Remer, INL	

		<ul style="list-style-type: none"> • Experience with Integrated Operations in Energy production in Equinor, lessons from O&G and offshore wind; past, ongoing and future • Modernization Initiatives and Savings from Integrated Operations in the U.S. Nuclear Industry • Core Success Criteria for implementation of Integrated Operations: Bridging Man, Technologies and Organisations. • Navigating the boundary between the virtual and the physical in next-generation operational models: AI, automation and digitalization 	Vidar Hepsø , Equinor Luke Martin , Scottmadden Trond Lilleng , Former Senior Advisor IO in Equinor Jan-Erik Nordtvedt , EPSIS	
11:45-13:00	We-IO	Panel discussion on success factors for implementing Integrated Operations	Bruce Hallbert , INL; Panellists	
13:00-17:00		Lunch on the Mountain and Social activity		
17:00-19:00		HPRG meeting	HPRG members	
19.00-21:00		Buffet Dinner		
Thursday 8th May				
08:30-09:30		Topic 2: Digital I&C – Safety Assurance, continued	Chair: Jacoline Hanekom , NRG Secretaries: Rune Fredriksen , Sizarta Sarshar	
08:30-08:50	Th-2-4	Structured safety argumentation for a nuclear reactor protection system – an assessor's view	Peter Karpati , Xueli Gao, IFE; Norbert Carte, US NRC	HTOR-027
08:50-09:10	Th-2-5	Performance-based analysis of an SMR application using a structured safety argumentation representation	Xueli Gao , Peter Karpati, IFE; Norbert Carte, US NRC	HTOR-078

09:10-09:30	Th-2-6	Advancements in Hazard Analysis for Safety Assurance and Evaluation: A State-of-the-Art Survey	Ankur Shukla , Coralie Esnoul, Charlotte Vrangsd, IFE	HTOR-080
09:30-10:00		Coffee Break		
10:00-11:30		Topic 6: Sustainable Decommissioning	Chair: Michael Passens, GRS Secretaries: Réka Szöke, Omar Zahra	Ref.:
10:00-10:30	Th-6-1	Keynote address: Reimagining the Nuclear Lifecycle with AI, Robotics & Digital Twins	Istvan Szöke , IFE	
10:30-10:50	Th-6-2	AI, Data, and Robotics in Nuclear Lifecycle Management	Réka Szöke , Abdenour Benkrid, Ankur Shukla, Lucas Stephane, Omar Zahra, IFE	HTOR-091
10:50-11:10	Th-6-3	Integrating AI and Mobile Sensing Technologies for Enhanced Safety Management in Nuclear Legacy and Decommissioning Sites	Omar Zahra , Abdenour Benkrid, Svein Tore Edvardsen, Mustafa Ali Hadi Jarallah, IFE	HTOR-098
11:10-11:30	Th-6-4	Reflections on Survey		
11:30-13:00		Lunch		
13:00-14:50		Topic 7: Cyber Security for Main Control Rooms	Chair: Sarah Lawrie, UKNNL Secretaries: Ankur Shukla, Sizarta Sarshar	Ref.:
13:00-13:30	Th-7-1	Keynote address: Experience in Integrating and Organizing Cybersecurity for Diverse Information Systems within Nuclear Power Plant	Oleksandr Puzyrnikov , Head of the I&C Department Affiliate "SS Rivne NPP" of the JSC "NNEGC Energoatom"	
13:30-13:50	Th-7-2	Cybersecurity of grey- and black-box technology and solutions in critical infrastructure	Stine A. Mikkelsplass , Levente Nyusti, Aleksander L. Toppe, IFE	HTOR-077
13:50-14:10	Th-7-3	Decision Support Systems (DSSs) for Distinguishing Attacks and Faults: A State-of-the-Art Review	Saba Chockalingam , Levente Nyusti, Ankur Shukla, IFE	HTOR-076

14:10-14:30	Th-7-4	Cyber Situational Awareness in Nuclear: Problem exploration, definitions and measurements challenges.	Espen Nystad , John Eidar Simensen, IFE	HTOR-079
14:30-14:50	Th-7-5	Control room operators' understanding of and response to a cybersecurity incident: Results from an exploratory simulator study and a scenario talk-through.	Espen Nystad , John Eidar Simensen, Rob McDonald, Daniel Odéen, IFE	HTOR-089
14:50-15:20		Coffee break		
15:20-16:50		Panel session with Main take-aways from EHPRG	Chair: Kenichi Hayase, CRIEPI Secretary: Andreas Bye Panel: Topic chairs	
19:00		Aperitif		
19:30		Banquet dinner		