

Enlarged Halden HTO Programme Review Group (EHPRG) meeting 2026

Technical program. For more info: <https://ife.no/en/event/enlarged-halden-programme-review-group-meeting-ehprg-2026/>

Monday 12 th October			
08:30 – 12:10	Paper No.:	Opening session Opportunities and challenges in today's nuclear renaissance	Chair: Jacoline Hanekom , NRG PALLAS Secretaries: Bjørn Axel Gran , Andreas Bye
08:30-08:40	Mo-00	Welcome and Introduction	Andreas Bye , IFE. Programme Manager, Halden HTO Project
08:40-09:00	Mo-01	Opening keynote (virtual)	William D. Magwood, IV , Director General, OECD Nuclear Energy Agency
09:00-09:15	Mo-02	New nuclear builds and programs in the Netherlands	Jacoline Hanekom , NRG PALLAS
09:15-09:50	Mo-03	Power Reactor Optimization to support US Nuclear Energy Capacity Expansion	Christopher Bunting , Office of Reactor Sustainability, Office of Nuclear Energy, U.S. Department of Energy; Bruce Hallbert , Idaho National Laboratory. Director, Technical Integration Office, DOE Light Water Reactor Sustainability (LWRS) Program
09:50-10:15	Mo-04	Canada's Nuclear Energy Strategy and readiness for a new nuclear build era	Mark Broeders , Director General, Directorate of Safety Management, Canadian Nuclear Safety Commission (CNSC); Edward Nakaza , HOF Specialist, CNSC
10:15-10:45		Coffee break	
10:45-11:15	Mo-05	Regulating for a New Nuclear Era: Enabling Innovation While Sustaining Safety	Christian Araguas , Deputy Director, Office of Advanced Reactors, U.S. Nuclear Regulatory Commission
11:15-11:30	Mo-06	The energy and nuclear situation in Norway	Nils Morten Huseby , CEO, IFE
11:30-11:50	Mo-07	NEA initiatives and perspectives on the future of the nuclear industry	Gabriela Miranda , Division Head, Radiological Protection and Human Aspects of Nuclear Safety, OECD Nuclear Energy Agency
11:50-12:10	Mo-08	Outlook from an advanced SMR technology vendor	Anders Blennermark , Blykalla

12:10-13:40		Lunch		
13:40-16:10		Topic 1: Human Performance	Chair: Johan Enkvist, SSM Secretaries: Jan Erik Farbrot and Peter Lirvall	Ref.:
13:40-14:10	Mo-1-1	Keynote address: Opportunities and Challenges in Human Factors Engineering: From FOAK Projects to Fleet Deployment	Shuhui Zhang, SNERDI	
14:10-14:30	Mo-1-2	Regulating the Use of Digital Twin Technology for Nuclear Operator Examinations: A Performance-Based Approach in the Absence of Explicit Regulatory Guidance	Spencer Brown, Maitha Al Taher, Mohamed Al Harbi, FANR	Paper
14:30-15:00		Coffee Break		
15:00-15:30	Mo-1-4	Crew briefs as interaction processes: A qualitative analysis of alignment, reassessment and recovery	Magnhild Kaarstad, Rob McDonald, Daniel Odéen, IFE; Yochan Kim, KAERI	HTOR-127
	Mo-1-5	Scenario-based synthesis of crew dynamics and assumption-driven vulnerabilities	Magnhild Kaarstad Daniel Odéen, Rob McDonald, IFE	HTOR-128
15:30-15:50	Mo-1-6	Decision-Making in the Control Room: A Replication Study with Computer-Based Procedures	Salvatore Massaiu, IFE	HTOR-104
15:50-16:10	Mo-1-7	Sensemaking in learning from events: Capturing and interpreting failures and successes in a team learning context	Prosper A. Kwei-Narh, Rossella Bisio, Awwal M. Arigi, IFE	HTOR-119
16:30-18:30		HPRG meeting		
19:00-19:30		Refreshments		
19:30		Seated Dinner		

Tuesday 13 th October				
08:30-11:20		Topic 2: Digital I&C – Safety Assurance	Chair: Anna Engelbrecht, Framatome Secretaries: Emilie Grecker and Fabien Sechi	Ref.:
08:30-09:00	Tu-2-1	Keynote address: Safety Assurance for future nuclear	Norbert Carte, NRC	
09:00-09:20	Tu-2-2	Advancing Performance-Based Safety Assurance: Lessons Learned from Structured Safety Argumentation and Regulatory Practice	Xueli Gao, Peter Karpati, IFE; Norbert Carte, U.S. NRC	HTOR-103
09:20-09:40	Tu-2-3	Aspect-Oriented Property Graphs (AOPG) for Safety Assurance	Peter Karpati, Xueli Gao, IFE; Norbert Carte, U.S. NRC	HTOR-110
09:40-10:00	Tu-2-4	AI-Assisted Rapid Prototyping of a Novel Safety Assurance Paradigm	Peter Karpati, Xueli Gao, IFE; Norbert Carte, U.S. NRC	HTOR-111
10:00-10:30		Coffee break		
10:30-10:45	Tu-2-5	Proceedings of the Workshop series 2026 on Safety of Digital Systems	Coralie Esnoul, Emilie Grecker, IFE	HTOR-113
10:45-11:00	Tu-2-6	Updating the State-of-the-art on Digital Systems: how to support to knowledge transfer	Coralie Esnoul, Lucas Stephane, Emilie Grecker, IFE	HTOR-114
11:00-11:20	Tu-2-7	STPA and HAZOP applied on an SMR case study	Charlotte Vrangund, Ankur Shukla, Emilie Grecker, IFE	HTOR-133
11:30-13:00		Lunch		

13:00-16:00		Topic 3: Control Room Design & Evaluation	Chair: Brandon Elliott, AtkinsRéalis Secretaries: Hanne K. Rødsethol and Sathiya K. Renganayagalu	Ref.:
13:00-13:30	Tu-3-1	Keynote address: Operator Training Programmes and Human Factor Aspects	Oleksandr Oshurko, Energoatom, Rivne NPP; Oleksandr Yatsun, Energoatom, South-Ukraine NPP	
13:30-13:50	Tu-3-2	An experimental investigation of how evaluator independence and system-specific knowledge influence human factors control room validation	Espen Nystad , Gyrð Skraaning Jr, Per Øivind Braarud, Robert MacDonald, Daniel Odéen, Aleksander B. Gundersen, IFE	HTOR-130
13:50-14:10	Tu-3-3	Examining Situation Awareness as a Distributed Process in Multi-Unit SMR Operations	Aleksander B. Gundersen , Daniel Odéen, IFE	HTOR-132
14:10-14:30	Tu-3-4	Operator Reliance on Overview Displays: Investigating Performance Impacts Through Display Loss in a Simulator Study.	Maren H. Rø Eitrheim , Langstrand, J.-P., Nguyen, H. T., Braseth, A. O., & McDonald, R., IFE	HTOR-107
14:30-14:50	Tu-3-5	Overview Displays in Multi-Unit SMR Control Rooms: Operators' Perspectives	Aleksander B. Gundersen , Maren H. Rø Eitrheim, Alf Ove Braseth, IFE	HTOR-115
14:50-15:20		Coffee Break		
15:20-15:40	Tu-3-6	Auditory Displays and Alarm Handling in Multi-Unit SMR Control Rooms	Jonas Andersson , Hanne K. Rødsethol, Håkon Jokstad, Lars Hurlen, Daniel Odéen and Robert McDonald, IFE	HTOR-134

15:40-16:00	Tu-3-7	Virtual Reality for NPP Control Room Operator Training and Early System Validation – Equivalence Study	Michael N. Louka , Sathiya K. Renganayagalu and Edward Langstrand, IFE	HTOR-118
16:00-16:50		Topic 4: Human-Automation Collaboration and Multi-Unit Operation	Chair: Bruce Hallbert, INL Secretaries: Magnhild Kaarstad, Stine Strand	Ref.:
16:00-16:30	Tu-4-1	Keynote address: Human-Automation Collaboration for Advanced Nuclear Operations: Research Directions and Regulatory Readiness	Niav Hughes Green , U.S. NRC	
16:30-16:50	Tu-4-2	Peer Checking in Multi-Unit SMRs: Practices and Operator Perspectives from Simulator Studies.	Maren H. Rø Eitrheim , Arigi, A. M., Zoutis, S., & McDonald, R., IFE	HTOR-117
17:00-19:30		Exhibitions and Demonstrations		
19:30-21:00		Buffet Dinner		
Wednesday 14th October				
08:30-10:30		Topic 4: Human-Automation Collaboration and Multi-Unit Operation, continued	Chair: Bruce Hallbert, INL Secretaries: Stine Strand and Magnhild Kaarstad	Ref.:
08:30-08:50	We-4-3	Control room work in SMR operations: Adaptation, redistribution or transformation of the operator role	Kine Reegård , Asgeir Drøivoldsmo, Robert McDonald, Daniel Odéen, IFE	HTOR-100
08:50-09:10	We-4-4	Operators' experiences of work in the advanced control room: insights to inform new ConOps	Prosper A. Kwei-Narh & Kine Reegård , IFE	HTOR-112

09:10-09:30	We-4-5	Making Sense of Automation	Gyrd Skraaning Jr. , IFE; Greg A. Jamieson, University of Toronto	HTOR-106
09:30-09:50	We-4-6	Simulation, Knowledge and AI	Michael Hildebrandt , IFE	HTOR-121-126
09:50-10:10	We-4-7	Verifiable Operator Support in Nuclear Main Control Rooms: An Operational Ontology That Externalizes the Operator's Cognitive Integration	Jung Sung Kang , KAERI	Paper
10:10-10:30	We-4-8	Error Modes in Multi-module SMR Operation	Awwal M. Arigi , IFE	HTOR-129
10:30-11:00		Coffee break		
11:00-12:30		Topic 5: Digital Systems for Operations and Maintenance	Chair: Sarah Lawrie, UKNNL Secretaries: Hans Olav Randem and Emil Wingstedt	Ref.:
11:00-11:30	We-5-1	Keynote address: Optimizing Our Nuclear Fleet: Current Initiatives and Updates	Ahmad Al Rashdan , INL	
11:30-11:50	We-5-2	Digital Twins for NPP Steam Generator O&M: Multi-Fidelity Modelling, Fault Detection, and Experiment Dashboard - Findings from a Prototype Testbed	Sathiya K. Renganayagalu , Emil Wingstedt, IFE	HTOR-138
11:50-12:10	We-5-3	Maintenance Optimization for NPPs: Assessing Input Familiarity of AI/ML models	Jens-Patrick Langstrand , Hans Olav Randem, Mario Hoffmann, Terje Bodal, IFE	HTOR-142
12:10-12:30	We-5-4	Institutional Pressures, Local Practice, and Nuclear Safety Culture: A Multilevel Framework	Prosper A. Kwei-Narh , IFE	HTOR-120
12:30-14:00		Lunch		
14:00-18:00		Social Activity		
19.00-21:00		Buffet Dinner		

Thursday 15 th October				
08:30-10:00		Topic 6: Sustainable Decommissioning	Chair: Spencer Brown, FANR Secretaries: Bálint Batki and Omar Zahra	
08:30-09:00	Th-6-1	Keynote address: Safety Culture and Human and Organisational Factors in Decommissioning: Insights from Event Investigations and Expert Interviews	Michael Paßens , Christian Lambertus, GRS	Paper
09:00-09:20	Th-6-2	Fleet-Ready Visual SLAM: Low-Cost Solutions for Nuclear Facility Mapping and Monitoring	Abdenour Benkrid, Omar Zahra , IFE	HTOR-143
09:20-09:40	Th-6-3	Precision at Scale: Autonomous Small-Part Manipulation for Nuclear Robotics	Omar Zahra , Abdenour Benkrid, Svein Tore Edvardsen, IFE	HTOR-144
09:40-10:10	Th-6-4	Safety and Readiness of AI, Data and Robotics in Nuclear Applications: TECOP, HAZOP and STPA perspectives	István Szőke, Réka Szőke, Ankur Shukla , Lucas Stephane , IFE	HTOR-137
		Prospective Robotic Inspection System-Theoretic Process Analysis for Station Blackout Emergency Operating Procedures	Lucas Stephane , Coralie Esnoul, IFE	HTOR-148
		HAZOP Analysis of Robotic First-Inspection Missions for Nuclear Emergency Response	Ankur Shukla , Abdenour Benkrid, Omar Zahra, Xueli Gao, IFE	HTOR-149
10:10-10:40		Coffee Break		
10:40-12:00		Topic 7: Cyber Security for Main Control Rooms	Chair: Jinkyun Park, KAERI Secretaries: Coralie Esnoul and Charlotte Vrangsund	Ref.:
10:40-11:10	Th-7-1	Keynote address: Enabling the Digital Nuclear Future: A Socio-Technical Approach to Cyber Security	Paul Smith , Lancaster University	
11:10-11:30	Th-7-2	Supply Chain Cybersecurity Risks, Challenges and Requirements for Grey-Box, Black-Box, and COTS Technologies: A Systematic Review and Gap Analysis	Fabien Sechi , Ankur Shukla and Sabarathinam Chockalingam, IFE	HTOR-105

11:30-12:00	Th-7-3	Cybersecurity of Grey-Box, Black-Box, and COTS Technologies: Insights from Expert Interviews in Safety-Critical Systems	Ankur Shukla , Fabien Sechi, IFE	HTOR-135
	Th-7-4	Cybersecurity Assessment of Grey-Box/Black-Box Technologies: A Case Study Using LLM-Based Systems	Aleksander Lygren Toppe , Ankur Shukla , IFE	HTOR-136
12:00-13:20		Lunch		
13:20-14:40		Topic 7: Cyber Security for Main Control Rooms, continued	Chair: Jinkyun Park, KAERI Secretaries: Coralie Esnoul and Charlotte Vrangsund	Ref.:
13:20-13:40	Th-7-5	Distinguishing Attacks and Faults in Nuclear Digital I&C Systems: Requirements, Constraints, and Operational Practices from Expert Interviews	Sabarathinam Chockalingam , Stine Aurora Mikkelsplass, IFE	HTOR-139
13:40-14:00	Th-7-6	Distinguishing Cyber-Attacks and Faults Using Heterogeneous Data: An Experimental Study in an IEC 62443-Aligned ICS Testbed	Aleksander Lygren Toppe, Emilie Greaker , Sabarathinam Chockalingam , IFE	HTOR-141
14:00-14:20	Th-7-7	Control room operators' cyber situational awareness during cyber incident scenarios	Espen Nystad , Fabien Sechi, John Eidar Simensen, IFE	HTOR-131
14:20-14:40	Th-7-8	Govern and trust your data: are Data Spaces something for the Nuclear Industry?	Rossella Bisio , Petter Kvalvik, IFE	Paper
14:40-15:00		Coffee break		
15:00-16:30		Panel session with Main take-aways from EHPRG	Chair: Jacoline Hanekom, NRG PALLAS Secretary: Andreas Bye Panel: Topic chairs	
19:00		Aperitif		
19:30		Banquet dinner		