

**International Workshop on the Safety Assessment of Nuclear Installations for Combinations of External Hazards**

**Provisional Programme**

**IRSN, 11-13 September 2023**

*CHAIR: Attila BAREITH, Vice-chair: Vincent REBOUR*

<b>DAY1: 11 September 2023 (Monday)</b>		
<b>Time</b>	<b>Title</b>	<b>Presenter</b>
<b>Opening Session</b>		
09:00 – 09:10	Welcome Message (IRSN, NEA)	Jean-Christophe NIEL (IRSN), Vesselina RANGUELOVA (NEA)
09:10 – 09:30	WGEV-WGRISK task survey report	Attila BAREITH (NUBIKI)
<b>Session 1 Screening and Impact</b> <b>Chair: Gernot THUMA / Co-chair: Marina ROEWKAMP</b>		
09:30 – 09:55	1.1 Operating Experience from Nuclear Power Plants for Hazard Combinations Induced by External Events	Ayhan ALTINYOLLAR (IAEA)
09:55 – 10:20	1.2 Procedure and Criteria That Narrow the Scope of All Hazards to Credible Mechanisms/Hazards and the Threats Resulting from Them	Jan PRUCHA (CEZ)
10:20 – 10:50	<b>Coffee break</b>	
10:50 – 11:15	1.3 Combined Hazards in PSA – New approach for crediting mitigation capabilities	Chris ROCHON (EPRI)
11:15 – 11:40	1.4 Comprehensive and Consistent Multi-step Hazards Screening Approach	Christian STRACK (GRS)
11:40 – 12:00	Discussion	
12:00 – 13:30	<b>Lunch break</b>	

<b>Session 2 Regulatory Environment / Reviews and Methodological Guidance/Standards for Combined Hazards</b> <b>Chair: Dana HAVLIN NOVAKOVA / Co-chair: Gernot THUMA</b>		
13:30 – 13:55	2.1 Combinations of External Hazards: French Regulatory Environment, Review of Licensees' Assessments, New Initiatives	Marie TOULZA (IRSN)
13:55 – 14:20	2.2 Combinations of Earthquake and Tsunami in AESJ PRA Standard	Byunghyun CHOI (JAEA)
14:20 – 14:45	2.3 Assessing External Event-Induced Hazard Combinations That can Potentially Impair the Safety of Nuclear Installations	Marina ROEWKAMP (GRS)
14:45 – 15:00	Discussion	
15:00 – 15:30	<b>Coffee Break</b>	
<b>Session 3-1 Selection and Assessment of Combined Hazards I</b> <b>Chair: Minkyu KIM / Co-chair: Andreas SCHWAB</b>		
15:30 – 15:55	3.1 Literature Survey and Effective Classification of Multi-hazards	Tsuyoshi TAKADA (JAEA)
15:55 – 16:20	3.2 Research Activities and Current Practices Related to the Assessment of Combinations of External Hazards in Finland	Marko MARJAMÄKI (STUK)
16:20 – 16:45	3.3 Basic Concepts and Simple Application for Combination of External Hazard Risk Assessment of NPPs	Minkyu KIM (KAERI)
16:45 – 17:00	Discussion	
17:00	<b>End</b>	

<b>DAY2: 12 September 2023 (Tuesday)</b>		
09:00 – 09:10	Recap (Minkyu KIM)	
<b>Session 3-2 Selection and Assessment of Combined Hazards II</b> <b>Chair: Marina ROEWKAMP, Co-chair: Joseph KANNEY</b>		
09:10 – 09:35	3.4 Towards a Unified Framework for Multi-Hazards Risk Assessment for Spatially Distributed Systems	Michelle BENSI (UMD)
09:35 – 10:00	3.5 Development of a Graded Bayesian Approach to Assess Compound Coastal Hazards	Michelle BENSI (UMD)
10:00 – 10:25	3.6 Deterministic External Hazards Combination Assessment for a New Build Nuclear Power Plant	Tim COURTNEY
10:25 – 10:40	Discussion	
10:40 – 11:10	<b>Coffee Break</b>	
<b>Session 3-3 Selection and Assessment of Combined Hazards III</b> <b>Chair: Joseph KANNEY/ Co-chair: Eujeong CHOI</b>		
11:10 – 11:35	3.7 Advancements in Regional Probabilistic Analysis of Coastal Storm Hazards: Applicability to Compound Hazards and Real-Time Prediction	Madison C. YAWN (USACE)
11:35 – 12:00	3.8 Probabilistic Coastal Compound Flood Hazard Analysis Pilot Study Incorporating Synthetic Hurricane Rainfall	Victor GONZALEZ (USACE)
12:00 – 13:30	<b>Lunch Break</b>	
13:30 – 13:55	3.9 Characterizing Uncertainty Associated with Tropical Cyclone Features and Forecasts – Application to Nuclear Power Plant PRA	Michelle BENSI (UMD)
13:55 – 14:20	3.10 Combined External Flooding Hazard Assessment Considering LIP and Storm Surge	Daegi HAHM (KAERI)
14:20 – 14:40	Discussion	
14:40 – 15:10	<b>Coffee Break</b>	

<b>Session 4 Assessment of Hazard Impact</b> <b>Chair: John PERDIKARIS / Co-chair: Vinh DANG</b>		
15:10 – 15:35	4.1 Probabilistic Assessment of Electric Transmission Towers under Combined Typhoon and Earthquake Hazards: Enhancing the Safety Assessment of Nuclear Installation	Jieun HUR (Ohio State University)
15:35 – 16:00	4.2 Assessment of the Impact of Earthquake – Induced Slope Failure on Nuclear Power Plant Safety	Shinyoung KWAG (Hanbit Nat. Uni.)
16:00 – 16:25	4.3 Probabilistic Modelling and Fragility inference of Condensate Storage Tanks Under a Sequence of Mainshocks and Aftershocks	Junho SONG (SNU)
16:25 – 16:50	4.4 Safety Significance of Earthquake Aftershocks: Sharing Views and Current Prospects	Emmanuel VIALLET (EDF)
16:50 – 17:10	Discussion	
17:10	END	

<b>DAY3: 13 September 2023 (Wednesday)</b>		
09:00 – 09:10	Recap (Vinh DANG)	
<b>Session 5-1 Risk Assessment (PSA) for Combined External Hazards I</b> <b>Chair: Vinh DANG /Co-chair: Attila BAREITH</b>		
09:10 – 09:35	5.1 Main Outcomes of the H2020 NARSIS Project	Evelyne FOERSTER (CEA)
09:35 – 10:00	5.2 Status of External Hazard PSA Development at IRSN	Maud KERVELLA (IRSN)
10:00 – 10:40	5.3 Current Status and Preliminary Outcomes of the Seismic-Tsunami Superposition PRA Project	Yukihiro KIRIMOTO, Eishiro HIGO (CRIEPI)
10:40 – 10:55	Discussion	
10:55 – 11:25	<b>Coffee Break</b>	

<b>Session 5-2 Risk Assessment (PSA) for Combined External Hazards II</b>		
<b>Chair: Attila BAREITH / Co-chair: Tamas SIKLOSSY</b>		
11:25 – 11:50	5.4 Assessing the Risk from Combined External Events for NPP Paks	Tamas SIKLOSSY (NUBIKI)
11:50 – 12:15	5.5 COHRISK: A Combined Hazard Risk Quantification Tool for Nuclear Power Plants	Eujeong CHOI (KAERI)
12:15 – 13:15	<b>Lunch Break</b>	
<b>Session 5-3 Risk Assessment (PSA) for Combined External Hazards III</b>		
<b>Chair: Attila BAREITH / Co-chair: Tamas SIKLOSSY</b>		
13:15 – 13:40	5.6 Lessons Learned from Applying a Framework for Assessing Combinations of Hazards in a Probabilistic Safety Assessment for Multiple Reactors	Halbert TAEKEMA (NRG)
13:40 – 14:05	5.7 Probabilistic Analyses of Single and Combined External Hazards for a Multi-Unit Nuclear Power Plant Site for Research Reactor Site in Germany	Marina ROEWKAMP (GRS)
14:05 – 14:25	Discussion	
14:25 – 14:35	<b>Coffee Break</b>	
<b>14:35 – 16:05 Panel Session</b>		
<b>Chair: Vincent Rebour / Co-chair: Attila Bareith</b>		
<b>Panel: Chris ROCHON, Gernot THUMA, Michelle BENSI, Tsuyoshi TAKADA, Joseph KANNEY, Vinh DANG, Tamas SIKLOSSY</b>		
16:05 – 16:20	Closing and Farewell	
16:20	<b>END OF THE WORKSHOP</b>	