

Committee on the Safety of Nuclear Installations (CSNI)

Working Group on External Events (WGEV)

John A. Nakoski, WGEV Vice Chair

**7th NRC Probabilistic Flood Hazard Assessment Workshop
February 2022**

WGEV Administration

- **WGEV Chair:** Min Kyu Kim (KAERI, South Korea)
- **WGEV Bureau:** John A. Nakoski – Vice Chair (NRC, USA), ShiZhong Lei (CNSC, Canada), Dana Havlin Novakova (SONS, Czechia), Vincent Rebours (IRSN, France), Gernot Thuma (GRS, Germany), Stef Carelsen (ANVS – Netherlands)
- **WGEV Participants from:**
 - Belgium (BelV), Bulgaria (Kozloduy NPP), Canada (CNSC, OPG), Czech Republic (SONS), Finland (STUK), France (IRSN, EdF), Germany (GRS), Japan (NRA), Netherlands (ANVS), Poland (PPA), Romania (Cernavoda NPP), Spain (CSN), South Korea (KAERI), Sweden (SSM), Switzerland (ENSI), United States (NRC, DOE, EPRI)
 - International Atomic Energy Agency, and World Metrological Organization
- **NEA Technical Secretariat:** Taehee Kim
- **Established in 2014**
- **Meets twice a year**

Completed Activities

- NEA/SEN/SIN/WGEV(2015)1 – Technical Note on Severe Weather with Concurrent Flooding and High Winds
- NEA/CSNI/R(2017)13 – Proceedings for the Workshop on Severe Weather and Storm Surge
- NEA/CSNI/R(2018)7 – Examination of Approaches for Screening External Hazards
- NEA/SEN/SIN/WGEV(2018)1 – Topical Report on Riverine Flooding
- NEA/SEN/SIN/WGEV(2018)13 – Proceedings for the Workshop on Riverine Flooding
- NEA/CSNI/R(2020)9 – Concepts and Definitions for Protective Measures in Response to External Flooding Hazards

Ongoing Activities (1 of 4)

- **Benchmark on Hazard Frequency and Magnitude Model Validation for External Events**
 - Approved by CSNI in June 2021, currently in publications
 - For more information contact Curtis Smith (Curtis.Smith@inl.gov) or Vincent Rebour (Vincent.Rebour@irsn.fr)
- **High winds and tornadoes**
 - Survey responses – February 2020
 - Preparation of initial draft report – June 2020
 - Final report – June 2021
 - Workshop – March 22nd – 25th, 2022 (Virtual)

Ongoing Activities (2 of 4)

- **High winds and tornadoes Workshop** March 22nd – 25th, 2022 (Virtual)
 1. **Phenomenological aspects of HW &T** – Main objective is to have subject matter experts share their understanding of the phenomena associated with HW&T.
 2. **Data** – Main objective is to have subject matter experts share their understanding of the sources of the data associated with HW&T.
 3. **Design& Operation** – Main objective is to better understand how the impacts from the HW&T are reflected in design and operation, including the issues associated with direct and indirect effects, and their combinations.
 4. **Safety case approaches** – Main objectives is to better understand the development of the safety case based on deterministic, probabilistic or combined assessments to demonstrate the design and operation of the facility will be done safely, considering HW&T. Also considering how climate change and/or combination of effects influences the safety case.

Ongoing Activities (3 of 4)

- **Combinations of External Hazards**
 - Hazards and Impact Assessment and Probabilistic Safety Analysis for Nuclear Installations (joint project of WGEV and WGRISK)
 - Kick-off meeting – February 2020
 - Survey responses – September 2020
 - Preparation of initial draft report – September 2021
 - Final survey response report – June 2022
 - Joint WGEV/WGRISK workshop – Fall of 2022

Ongoing Activities (4 of 4)

• **Uncertainties in the Assessment of Natural Hazards**

Phase 1 - Sources of Uncertainty

- **Decision on Spectrum of natural hazards to consider – March 2021**
- **Draft report based on literature review – March 2022**
- **Workshop on Sources of Uncertainty – April 15th to 18th, 2022 (hybrid – virtual/in person in Prague)**
- **Technical Report and Workshop Proceedings – December 2023**

Phase 2 - Methods to Deal with Uncertainties

- **Report Structure and Content decided – September 2022**
- **Workshop on Methods to Deal with Uncertainties – March 2024**
- **Technical Report and Workshop Proceedings – December 2024**

Potential Future Activities

- **Local Intense Precipitation** – under development
- **Topical discussions and issues being considered**
 - Geomagnetic Storms and Space weather
 - Improving data sources for hazards assessment
 - Climate Change impacts on Hazards Assessment



Thank you for your attention!