

Title

A Small Digital Human Error, Big Physical Consequences: From a Gamified Icebreaker to Validating an IT/OT-ICS Security and Safety Taxonomy

Summary & Relevance

The **human factor** remains one of the most significant challenges in cybersecurity with “60% of breaches involved a human element “

[<https://www.verizon.com/business/resources/Tb84/reports/2025-dbir-data-breach-investigations-report.pdf>].

These risks are especially severe in **Industrial Control Systems (ICS)** and **smart grids**, where a single human error or manipulation can trigger cascading, large-scale consequences. [<https://www.cisa.gov/news-events/cybersecurity-advisories/aa22-265a>]

To address these threats, there is a need to strengthen individuals’ information security awareness (ISA).

This workshop provides a comprehensive overview of current methods for assessing and improving ISA, and introduces a new taxonomy designed to **bridge IT and OT (Information Technology and Operational Technology) security and safety** in critical infrastructures such as smart grids and industrial control systems (ICS/SCADA). The taxonomy helps researchers and practitioners map threats, address safety dilemmas, and strengthen risk governance—ultimately uniting safety, security, and human factors to make our systems more resilient.

The workshop aligns closely with NIKT’s focus on information security, software engineering, and emerging socio-technical challenges, while also encouraging interdisciplinary perspectives from safety engineering and critical infrastructure management.

Format & Activities

The workshop will be fully on-site at HiØ Campus Halden (half-day). To foster creativity and engagement, we propose an interactive, non-traditional format combining gamification, group work, and collaborative surveys:

- **Introduction to Information Security Awareness and Icebreaker Game (50 min):**
This session highlights the critical role of human factors in cybersecurity, emphasizing the need to prevent errors in Industrial Control Systems (ICS). It continues with the Elements of Protection (EoP) card-based game, designed to spark discussion and illustrate common security–safety dilemmas in ICS/SCADA environments.
- **Break (10 min):** Coffee and networking.
- **Taxonomy Survey (60 min):** Participants evaluate and validate different aspects of the taxonomy through structured questions.
- **Break (10 min):** Coffee and networking.

- **Scenario Validation & Recap (50 min):** A Smart Grid/SCADA scenario is introduced where participants apply the taxonomy to identify overlaps and conflicts between safety and security. Results are discussed in plenary, followed by a short survey for feedback.

This format is meant to maximize participant interaction, knowledge exchange, and hands-on validation of the taxonomy.

Goals

- Promote awareness of the human element in cybersecurity and its impact on IT/OT system resilience.
- Validate the proposed IT/OT security and safety taxonomy with an interdisciplinary community.
- Foster dialogue between researchers and practitioners on safety–security dilemmas.
- Produce a set of consolidated feedback results that can guide future taxonomy refinements.

Organizers

- **Fabien Sechi** – PhD in ICT (specialization in cybersecurity & privacy), researcher on IT/OT security for smart grids, with experience leading academic–industrial workshops. at University of Agder
- **Nadia Saad Noori** – Assistant Professor and Researcher in cybersecurity for critical infrastructures at University of Agder
- **Gil Agmon** - AI & Cybersecurity researcher at BGU
- **Ofir Cohen** - Ph.D. Researcher in AI and Cybersecurity at BGU

Participants

- **Maximum:** 30 participants (to ensure interactive discussions).
- **Recruitment & Selection:** Open call through NIKT channels. Selection based on interest and relevance of background (short motivation at registration). We aim for a balanced mix of academic researchers, PhD students, and practitioners from industry.

Equipment & Supplies

- Standard room setup with projector/whiteboard.
- Tables arranged to allow small-group discussions.
- Printed *EoP* card decks for the icebreaker game.
- Access to online survey tools (participants can use personal laptops or smartphones).

Online Resources

A dedicated webpage will be set up with workshop details, registration, pre-read material, and post-workshop results.