

Human and Organizational Factors in Nuclear Safety

27 – 29 September 2022

A hybrid Round Table to be arranged in Helsinki, Finland

We will host a Round Table, which is targeted at *Human and Organizational Factors (HOF) in Nuclear Safety*. It will provide a physical meeting for interested participants (max 20) in the Finnish Institute of Occupational Health, FIOH (tram 4 stop Töölöntulli) facilities in Helsinki as well as a series of presentations and discussions over the web. The final program of the Round Table will be assembled and sent to persons that have indicated interest in the Round Table.

Our goal is twofold:

- 1) To provide involved researchers with an opportunity to meet, present and discuss lessons learned from a research project that resulted in an article¹ in the journal *Energy Research & Social Science*.
- 2) Present and elaborate ideas for cooperation projects between researchers as well as with nuclear actors. The article identified the following issues and challenges to be addressed in future research and development activities of the nuclear industry in Europe:
 - All three major nuclear accidents (TMI, Chernobyl, Fukushima) were influenced by failures and deficiencies related to human factors, organizational performance, and safety culture.
 - Future safety research and development activities in the nuclear industry should concentrate on issues to prevent further nuclear accidents, which implies a need for improved theories, models, methods, and tools to assess influences of human and organizational factors on safety of socio-technical systems.
 - To succeed it would be necessary to promote increased cooperation between not only nuclear power plants in Europe, but also between industry and academia within Europe. There is an intrinsic value of strengthening a broad collaboration that is highlighted in the current ecological and geopolitical situation, while there is an urgent need to initiate energy transitions towards carbon neutral energy productions in Europe.

We foresee sessions to be arranged for three days. In the first (Tue 27 Sep) members of the research community will meet in person and prepare for presentations the next day. The second day (Wed 28 Sep) over the web consists of presentations by researchers on lessons learned and challenges identified in a morning session. In the afternoon contributed proposals for addressing identified challenges will be presented. The third day (Thu 29 Sep) also over the web is open for participants to ask additional questions and presents suggestions for research and development to be initiated. The programme of the Round Table is presented in more detail below.

Please consider your personal participation in our Round Table.

Yours sincerely

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¹ Schöbel et al. 2022, Human and organizational factors in European nuclear safety: A fifty-year perspective on insights, implementations, and ways forward, *Energy Research & Social Science*, 85, 102378.

Human and Organizational Factors (HOF) in Nuclear Safety

On behalf of the Round Table programme group, it is our pleasure to provide the following additional information. We see it not only as a single event, but as the first step of a process to search for challenges, ideas and solutions that may help in ensuring continued safe and economic operation of nuclear power in Europe. Our involvement is based on the observation that the environment of for nuclear power plants in Europe has changed, which according to respondents from eight nuclear power plants in Germany, Finland, Spain, Sweden, and Switzerland has among others indicated the following challenges:

- There is a need to prevent the loss of knowledge and ensure the availability of competent personnel, which ultimately leads to the recruitment of qualified junior staff.
- A changed framework of conditions (social, economic, technical, and geopolitical) under which nuclear power plants are operated today, induces the need for an increased exchange of HOF influences on nuclear safety between the operators of present nuclear power plants in Europe.
- Integration of human and organizational factors into risk assessments and other safety management procedures, which are used to manage operational, tactical, and strategic decisions of the plants during their life cycles.

The initiative to the Round Table was taken by the contributors to the ERSS-article as a mean to provide on one hand our respondents from the nuclear power plants with tangible feedback from the research. On the other hand, we see the Round Table as an opportunity for the academia and the industry to consider concrete possibilities for an increased cooperation. In our work we have read articles with proposals for future research activities, but unfortunately most proposals are either not practical enough or not scientifically sound. We have within our joint project LSrevisited already generated a preliminary list of ideas that can provide a basis for industry and academia to ponder new research directions and activities, by which the nuclear industry might find models, methods, and tools for an increased safety.

In the preparation for the Round Table, we foresee a collection of inputs on needs from our participating organisations and their collaborators in the form of short abstracts and proposals for discussions. These inputs will form the core of the second session of the Round Table in its second day. Based on this input participants may during the third day of the Round Table agree on further contacts to make the suggestions more concrete. After the Round Table it is up to the participants to continue discussions with their counterparts to create concrete plans for collaboration, research projects and applications for funding.

We foresee the following dates for the preparations and execution of the Round Table:

- registration for the Round Table, 15.7.2022
- submission of abstracts (150-200 words) for short discussions (challenges, solutions) during the afternoon session of the second day, 15.8.2022
- programme together with abstracts sent to participants, 31.8.2022
- discussions among participants in the first session of the Round Table 27.9.2022
- presentations and discussions over the web in the second and third sessions, 28.9.2022
- discussions for making presented ideas more concrete in different streams over the web, 29.9.2022

Round Table on Human and Organizational Factors' challenges in European nuclear safety

GOAL OF THE ROUND TABLE:

The goal of the Round Table can be expressed in the following bullets to

- provide our respondents at the nuclear power plants in Europe with tangible feedback,
- deepen our understanding of how human and organizational factors influence nuclear safety,
- discuss and share best practices and proposals about how to tackle identified challenges.

BENEFITS FOR PARTICIPANTS:

We foresee that the outputs of the Round Table can be taken home by representatives of both academia and industry to influence their future activities.

CURRENT CHALLENGES:

The challenges were addressed in the IAEA 2014 report on “Human and Organizational Factors in Nuclear Safety in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant” and emerged also from our interviews with managers from the nuclear industry. We foresee that the list below can be broken down into specific questions of present concerns:

1. How can we maintain nuclear know-how?
2. How to improve in terms of emergency preparedness?
3. What have we learnt from COVID?
4. How to put lessons learned from events into perspective so that they become meaningful/insightful to improve human and organizational factors influencing safety?
5. How safety science (theories, models, methods, tools) can move a step further and become more practical for the field (as opposed to just help in framing problems)?
6. How to redefine the relationship between nuclear power plants and regulators?
7. How to include HOF issues into risk and safety assessments?

FORMAT AND CONTENT:

We have so far planned for four sessions, which will be extended as preparations of concrete proposals for future projects with funding plans. The four sessions will have the following content and structure.

Day 1: A physical session between involved researchers to enable in-depth discussions of research themes and prepare for next day presentations.

Day 2: Arranged with hybrid mode in two sessions 1) lessons learned from the LSrevisited project, 2) challenges identified in the project and ideas for cooperation between industry and academia.

Day 3: Arranged with hybrid mode for discussions of initiatives identified during the previous days, with the aim of preparing for cooperative activities to be initiated between the parties.

time	Day 1	Day 2	Day 3
10-13		physical and web based presentations by researchers challenges & proposals	physical and web based chaired by proposers preparations of proposals
14-17	physical meeting discussion of research themes preparations for the next day	physical and web based presentations by participants selection of themes for discussions	

Registered participants may consult the web site at <https://www.bewas.fi//LSrevisited.html>.