



SocioTechnical safety Assessment within Risk Regulation Regimes (STARS) VTT – INERIS - University of Stavanger

Funding

**NCR, MEDDE,
TUKES, FonCSI,
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Project Coordinator: Teemu Reiman

teemu.reiman@vtt.fi

Basis for project

- The past thirty years of research on accidents have built an understanding of ensuring safety that goes beyond technical rationality and traditional engineering models
- Safety regulation has been traditionally focused on the control of technical matters – and lately on formal management systems
- So far, little focus on the emerging sociotechnical approach to safety

The project aims to

- explore what this shift towards a sociotechnical approach entails from a scientific point of view and how it affects management of safety by both the industry and the regulators,
- compare the practices in risk regulatory regimes on sociotechnical approaches to safety critical systems,
- clarify the role of regulation (limits and possibilities) in ensuring sociotechnical safety in society, and
- develop an evidence based guide on how to develop regulatory practices towards taking better into account the sociotechnical dimensions of safety.

Research questions

- what is the state of the art on the sociotechnical nature of safety?
- what methods, practices and guidelines are currently in use in various regulatory bodies concerning assessment of high risk sociotechnical systems?
- how well do these methods, practices and guidelines capture sociotechnical phenomena (such as drift, normalization, climate and social structure)?
- what experiences regulators have concerning sociotechnical phenomena that have safety relevance?
- how could the existing methods, practices and guidelines be improved to better capture sociotechnical phenomena?
- what is the role of regulation in the sociotechnical paradigm; what are the limits and possibilities of regulation when safety is perceived in a wider sociotechnical view as a system property instead of a technical feature

Research steps

- **Clarifying and showing** how different models in the past 20 to 30 years have all attempted to better conceptualise and approach the sociotechnical nature of safety and accidents (Swiss cheese, safety culture, resilience engineering, etc.),
- **empirically illustrating** the sociotechnical nature of safety (or accidents) with case studies from different safety critical industries (petroleum, chemical, nuclear) in order to provide a shared background for members of the research project
- **comparing and discussing** the practices of the participating regulatory organizations (rules and regulations, auditing and inspection principles, other methods of regulation) in three different domains: petroleum, chemical and nuclear industry,
- **producing guidance** on EU-level; one guidebook to be used by regulators in sociotechnical safety inspections of safety critical system and a second guidebook to be used by the industry as well as the regulators in deepening their understanding of the sociotechnical dimension of safety.

Tasks

- 1. Construction of a common study protocol**
- 2. Literature review and collection of methodological evidence**
- 3. Data collection and case studies in Finland**
- 4. Data collection and case studies in Norway**
- 5. Data collection and case studies in France**
- 6. Across domains and countries comparison**
- 7. Reporting and utilization of the common results**

Project progress

- The project started in May 2014 (unofficially) and in November 2014 (officially)
- The project will end in autumn 2016
- The project group (VTT, INERIS, UiS) has held four internal workshops
- Case studies in all three countries have started according to the common study protocol
- Three parallel foci: regulatory regimes, sociotechnical safety, practices of regulating sociotechnical aspect
 - => identification of relevant themes and inspecting how they manifest in the different regimes
 - => extracting lessons on how the manifestations grasp sociotechnical phenomena, and how to improve this

Some identified issues and themes - preliminary

- **The diversity in the regulated industries and the risk regulatory regimes**
 - Reflecting historical development, accidents, specific nation contexts
 - Roles and espoused values of the regulators and other parties
- **Changes in the regulatory strategies based on political and economic debates (e.g. the cost-effectiveness of regulation)**
 - Also changes after accidents (include the political dimension too)
- **The scope and depth of regulation and the issues the regulator does not want to know – or does not consider relevant**
 - Reflects to inspection practices, regulations, decisions
 - Related also to the (ambivalence of the) role of the regulator => often left to individual inspector to decide
 - Sticking to one's own technical area vs. an overview of safety issues in the organization

Some identified issues and themes - preliminary

- **The possibility for risk regulation regimes to harness complex sociotechnological issues**
 - Safety is a product of interactions between a diversity of categories of people that is only partly accounted by paperwork and auditing
 - Collecting data about real work situations is challenging in the context of current regulatory frameworks
- **Companies often evolve quicker than regulators**
 - How can a regulator be proactive?

Some identified issues and themes - preliminary

- **The safety importance of mechanisms generating / sustaining trust or mistrust**
 - Trust as an outcome, prerequisite, or both
 - Trust as both a negative and positive safety force
- **The role of power**
 - between the regulator and the industry
 - also inside the regulated organizations – maybe also inside the regulator
- **Risk basedness of the regulatory approaches**
 - The trade-offs involved – often includes
 - How is risk defined and measured

- ... more to be identified

Deliverables

- **Deliverable 1** (“white paper” in the research proposal): A document describing the sociotechnical view on safety to be used by the industry as well as the regulators in deepening their understanding of the sociotechnical dimension of safety. The document will be published in English in FonCSI’s “Industrial safety cahiers” collection of documents. Outline of the contents:
- **Deliverable 2:** Three workshops will be arranged, one in each participating country, where the results will be presented and discussed with both the steering group experts as well as representatives from the regulators and the industry.
- **Deliverable 3** (in lieu of “final report”): A document on sociotechnical inspection in high risk systems, providing evidence-based guidance to regulators and safety-critical organizations about the possibilities and limits of sociotechnical safety assessment. The document will be published in English in FonCSI’s “Industrial safety cahiers” collection of documents.

Next steps

- Case studies and the construction / revision of the common study protocol will continue
- The white paper on the fundamentals of sociotechnical safety
- A special session on the **Challenges of sociotechnological oversight in safety critical industries** WOS 2015 conference in Porto, Portugal, 23-25 September, 2015 (www.wos2015.net)
- A wider workshop including steering board members will be arranged in tandem with the WOS 2015 conference in Porto
- Collecting lessons learned and best practice on how to regulate sociotechnical issues