Social science for safety: What is it and why do we need it?

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Eras of safety: Changing role of social science

< 1950 > 1990

Technology	Human Factors	Management systems
= Fit human to task	**= Fit task to human**	**= Systemic approach**
Personnel selection Training	Interface design Function allocation Workload Safety rules Human reliability assessment	Leadership Team dynamics Work system design Organizational learning Organizational change Organizational culture Regulatory regimes

There is no turning back – Safety needs social science

- To select and train people
- To create appropriate work environments
- To understand human decision-making and motivation
- To support teamwork and leadership
- To foster learning and change
- To balance internal and external oversight
- To shape the dialogue with the public
- …

Interdisciplinary systemic safety: Bridging different worldviews (Grote, 2015)

- Risk control
  - Central control for stability: Minimizing uncertainty
  - Local control for resilience: Coping with uncertainty
  - Adaptive control for innovation: Creating uncertainty
- Role of human actor and technology
  - Risk factor
  - Safety factor
- Rationality
  - Consistent and maximum use of information
  - Adaptive human functioning

Experiments on rationality …

Which is more probable: Linda, a single 31-year-old woman with a philosophy degree and left wing political views is

- a bank teller
- a bank teller and an active feminist

Dialogue across professions for a truly integral approach to safety

- Foster perspective taking and cross-learning
- Reflect on and reconcile different belief systems
- Establish a culture of interdisciplinary appreciation

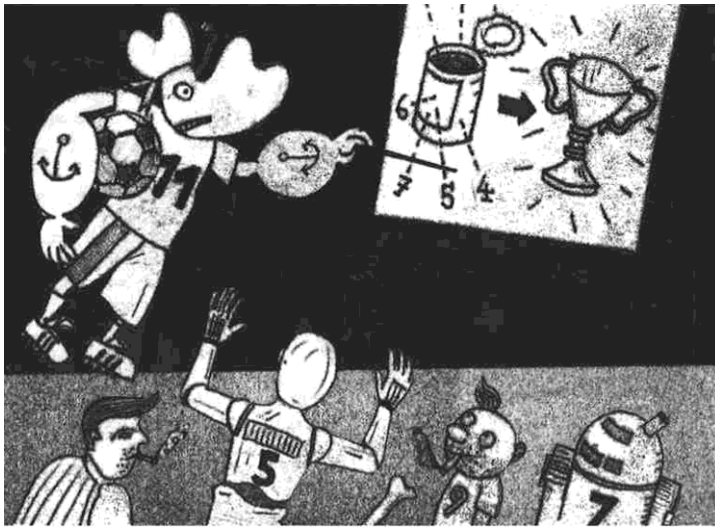
Methods for interdisciplinary dialogue

- Example 1: KOMPASS
- Example 2: ENSI Dialogues on Safety Culture
- Example 3: After-Event Reviews

KOMPASS

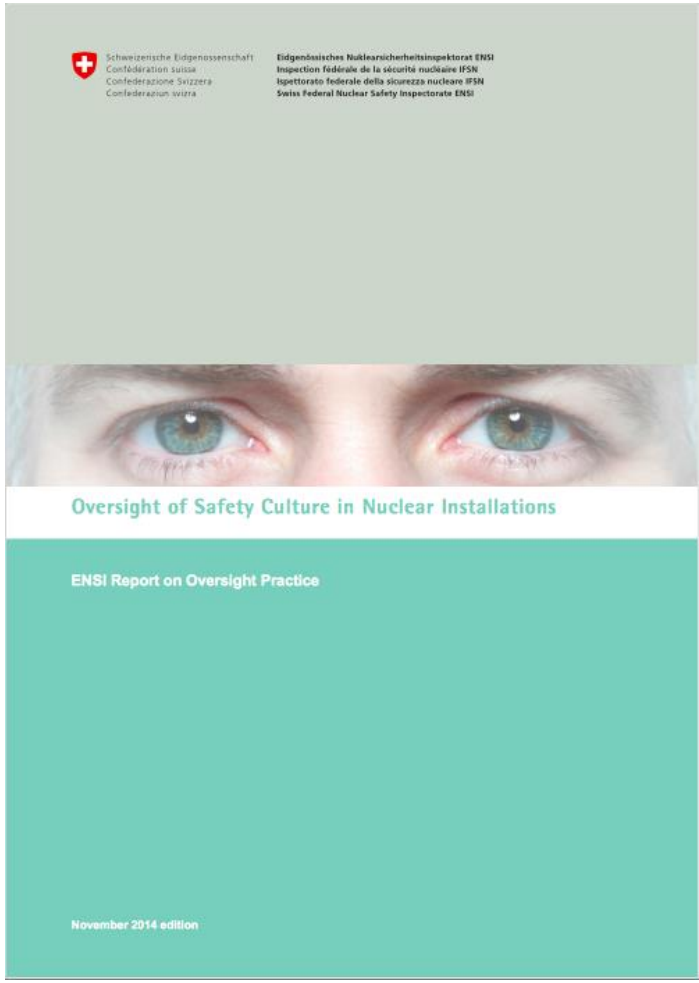
(Complementary analysis and design of socio-technical systems: Grote et al., 2000; Wäfler et al., 2003))

- Analysis of design scenarios against a fixed set of criteria
  - Match of human control and accountability, motivation through task orientation, self-managing teams
- Design process built on shared design philosophy
  - Moderated dialogue on (implicit) design assumptions: What differen-tiates successful work systems; What do humans, technology and organi-zation contribute to success; What do humans need to make their contribution



ENSI Dialogues on Safety Culture in Nuclear Installations

- Part 1: Open discussion on case-by-case topics (3h)
- Analysis of discussion
  - «What we heard»
  - Specific hypotheses to capture underlying themes
- Part 2: Feedback (3h)
  - «Mirror»
  - Verification of statements
  - Discussion of hypotheses
- Final report



After-Event Reviews

(e.g. TeamGAINS, Kolbe et al., 2012)

- Structured team review of successes and failures
- Setting that supports psycholological safety
- Moderation techniques that foster learning orientation
  - Humble inquiry (Schein, 2013)
  - Encourage perspective taking
  - Guided team self-correction

Thank you!

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