



Safety culture – dimensions and evaluation

NKS-R and NKS-B Joint Summary Seminar, 26-27 March 2009, Stockholm, Sweden

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Goals of the MOSACA 2008-2010 project

- **Construct a model of safety culture which allows measurement of its key dimensions as well as targeting of development initiatives (2008)**
- Empirically clarify the central characteristics and shared or differing viewpoints on safety culture in the Nordic nuclear industry (2009)
- *Test the model of safety culture in case studies, and revise the model accordingly (2010)*
 - *Survey*
 - *Interviews*
 - *seminars*
- *Create advice and recommendations on safety culture evaluation and development in the nuclear industry (2008-2010)*
- Carried out in collaboration between VTT, KTH and RiskPilot
 - Teemu Reiman, Pia Oedewald, Elina Pietikäinen (VTT)
 - Carl Rollenhagen (KTH)
 - Ulf Kahlbom (RiskPilot AB)

Safety culture = organizational culture = system safety?

- There are various definitions of safety culture
 - Some emphasize only the personnel aspects
 - Some state that only organizations with good safety values have a safety culture
 - Some include also issues related to technology, practices and tools
 - We argue that organizational culture is a holistic term that includes
 - The organizational core task and the basic production technology
 - Psychological properties and conceptions of the personnel
 - Social processes in the organization
 - Organizational dimensions (structures and processes) at the organization
 - And excludes actual performance in specific situations
 - Safety culture can include any or all of the above mentioned concepts
 - “Safety culture” is not a natural phenomenon (cf. radiation, corrosion)
 - “Safety culture” is a social construct: a way of looking at the organization, a way of defining what is important in terms of safety
 - What is included in “safety culture” is a matter of social definition, and that defines how much of system safety it explains
- ⇒ Because our aim is to contribute to understanding of system safety, we look at issues ranging from technology to organizational processes
- ⇒ The essence of safety culture is the ability and willingness of the organization to take care of its core task and control the associated hazards

Why culture matters

- Culture is a solution to the problems of the past
 - Problems of internal integration and external adaptation
 - Not always perfect, but something that has allowed the organization to carry on
- Culture is a system of meanings
 - Members of organizations assign meanings and beliefs to organizational behaviour and structures.
 - These assigned meanings in turn influence the ways in which the members behave themselves
- Culture is a duality of social and physical / technical:
 - People give technology meaning, design, use, and maintain it, and construct their image of the work with the technology
 - Technology both constrains and enables activity
- Culture is ongoing social construction
 - Organizational reality is an ongoing accomplishment, not a stable outcome. In this cultural process, the content and meanings of safety, efficiency and employee well-being are socially constructed.
 - Culture is self-reproducing at the same time as it is changing
 - This change is gradual and hard to notice from the inside
- Culture defines what the organization ignores, what it considers non-important, and what is recognized as being critical for success
 - What concepts are used, and how, to enact social reality

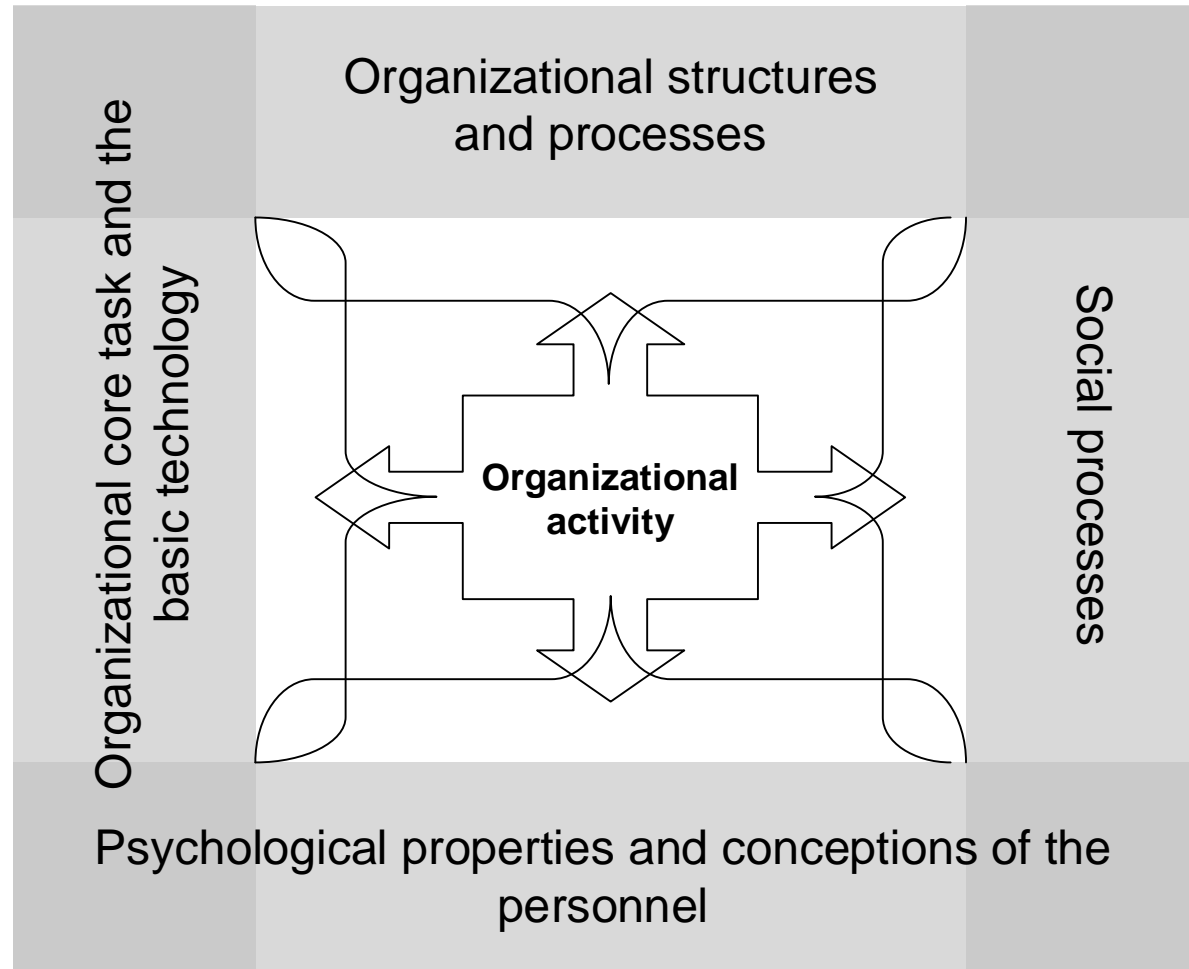
Influence of concepts in defining risks – “a leaking seal” in the Challenger disaster

”Any airplane designer, automobile designer, rocket designer would say that [O-ring] seals have to seal. They would agree on that. But to what degree do they have to seal? There are no perfect, zero-leak seals. All seals leak some. It’s rare seal that doesn’t leak at all. So then you get into realm of ‘what’s a leaking seal?’. From one technical industry to another, the severity of it and the degrees that’s permissible would change ... all within the same definition of seals ... How much is acceptable? Well, that gets to be very subjective, as well as empirical. You've got to have some experience with the things to see what you can really live with..” (Larry Wear from NASA Marshall Center, in Vaughan, 1996, p. 115)

"organizations are defined by what they ignore – ignorance that is embodied in assumptions – and by the extent to which people in them neglect the same kinds of considerations" (Weick, 1998, p. 74).

Elements of the organizational (safety) culture

(Reiman & Oedewald, 2009)



Organizational dimensions are the way to influence the deeper dimensions of safety culture (Reiman & Oedewald, 2009, in press)



Safety effects of culture

- Organizational safety culture affects the way hazards are perceived and risks evaluated and risk management conducted
 - The perceptions of hazards can further vary between subcultures, as can the opinions on the best countermeasures
 - Known and “controlled” hazards have caused plenty of accidents since they were no longer considered risky
- Organizational safety culture affects the way the current safety level is interpreted
- Organizational safety culture defines what is considered normal and what abnormal or deviant
 - Expectations then direct attention and perception
- Organizational safety culture defines the correct ways to behave in risk situations and correct ways to talk about safety, risks or uncertainty
- Organizational safety culture defines and influences normal work;
 - what is considered normal work,
 - how it should be carried out,
 - what are the potential warning signals,
 - how to act in abnormal situations

More information

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