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An attempt for a synthesis

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Content of presentation

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What have we achieved?

- The interactions between academia and practitioners have been very stimulating
- The multi-country/multi-plant project gives clear indications that problems are similar ⇒ there is a benefit of sharing experience
- The area is complex ⇒ several different models are required to explain important relationships
- The activities have sensitised senior managers at the NPPs to the importance of the issues
- The research organisations have had an opportunity to exchange thoughts, views, methods and tools
- There has been a possibility for young researchers to get involved
- New methods and tools have been created (self-assessments, data-handling)

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LearnSafe benefits for the participating NPPs

- People at the nuclear power plants have been forced to discuss important preconditions for safety
- Main LearnSafe activities may have been somewhat distant from the plants, but they have been very important for the research group
- The preparation of the case studies from Finland and Sweden gave a good inventory of on-going activities at the NPPs
- The spin-off activities have generated some immediate benefits
- Ideas and activities that are around in the field of HF/OF have been collected, interpreted and discussed with plant people
- People from the participating nuclear power plants have been given an opportunity to think

There has been a large enthusiasm at seminars and meetings!

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Crucial components in building safety

On all levels in the organisation, ensure

- awareness and understanding
- ownership and commitment
- clear, understood and accepted organisational structures

Communication

- horizontal and vertical
- encourage people to speak up
- managers should avoid double messages

Prepare for the unexpected by ensuring

- availability of instruction and procedures
- some slack in resources

Empowerment

- belief in people
- delegation of authority and responsibility

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The use of time

People at the plants struggle with a lack of time.

- lack of time has to do with priorities and practices
  - doing the right things
  - doing things right
- lack of time may decrease quality of work
  - the order in which tasks are executed depends on pressure felt
  - people loose ability to see interactions with other tasks
  - things good to know are given less attention
  - a strategic outlook disappears
- too much time may cause other problems
  - the play of power games
  - loss of focus, wrong priorities
  - fulfilling of various consuming passions

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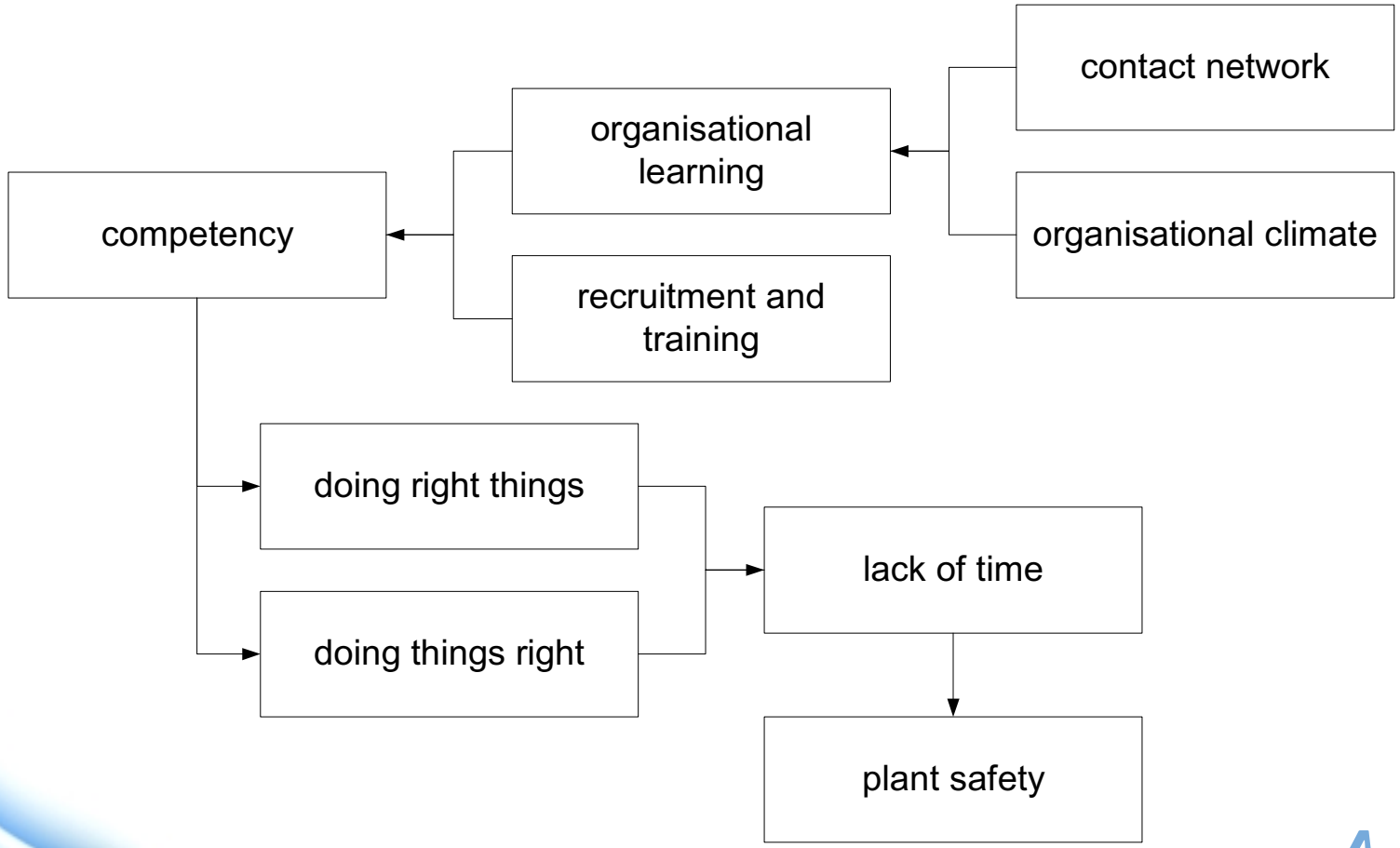
An influence diagram



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Conflicts between safety and economy?

There is a large agreement that there are no conflicts in principle!

- There has been a change from a culture, where only the best was good enough to a consideration of what is good enough
- Economic performance is easy to follow, safety performance is more difficult
- Difficulties in communicating new economic realities
- Incidents carry large costs in the form of lost production, extra work efforts and decreased confidence in the operation
- Examples were given of situations, where savings in the small have caused additional costs.

There is a need for better management tools for assessing safety!

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A set of emerging questions

- Risk assessment of organisational change projects – can we develop better models and tools?
- How to balance an increased specialisation in various subject areas with systemic perspectives that perceive the “big picture” – how is this possible in safety management?
- The concept of safety culture is in need of rethinking – are the dimensions commonly used to measure safety culture sufficient?
- How to asses creative and adaptive potentials in organisations?
- To what extent do academic perspectives really get in touch with the reality “out there” – is there a need for new interfaces?

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New organisational structures

Reflections on organisational structures in nuclear power plants

- Organisational structures around the year 2030
  - network organisations!
  - formal rules versus individual accountability?
  - the use of various computerised support systems!
- New ways to structure work
  - how to work smarter and be more efficient?
  - prescriptive versus risk informed requirements?
  - personal initiatives versus command and control?
- Management challenges
  - how to meet an increasing number of demands?
  - understand the business (uncertainty, complexity)!

How to find proactive strategies that meet present and upcoming needs?

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A set of balances

There are multiple balances that managers have to cope with!

- consensus – constructive criticism
- flexibility – discipline
- accountability and trust – supervision and control
- innovation and change – traditions and stability
- willingness to challenge old practices – being able to build on existing knowledge and experience
- freedom to initiate new activities – restrict the number of concurrent activities
- enabling leadership – forceful leadership
- operational focus – strategic focus
- willingness to listen – professional pride
- etc.

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Present state of research in HF/OF

Human and organisational factors (HF/OF) matters in safety!

- The largest remaining root cause to incidents at the plants
- There are still large beliefs in technical fixes to problems
- Publicly funded HF/OF research is largely regulatory driven
- Research in HF/OF is rather scattered
- Academic HF/OF research is often quite theoretical
- Practical guidance within HF/OF seldom has a sound theoretical foundation
- There is a rather limited interactions between nuclear and other high-risk industries
- There is no centre in Europe with a broad focus on risk and safety research

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Challenges in nuclear safety research

The deregulation forced a change, adaptation is still going on

- organisational changes take time
- it is difficult to change cultures
- safety management has to adapt dynamically to changed conditions

Difficulties in transferring identified problems to sustainable solutions

- there is a need for a holistic view
- available guidance is rather general
- support for selection, planning and implementation of remedial actions

Need for bridging gaps between theory and practices

- a recognition of the importance of human and organisational factors
- creation of an understanding of all underlying issues
- arguments of safety have to build on scientific and technical evidence

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FP6, Network of Excellence, SafeMan

Strategies and Practices of Safety Management

- An industry led network, aimed at initiating and funding new research.
- Aimed at the establishment of a common platform for the co-ordination and sharing of research activities connected to safety management.
- Counteracting increasing barriers for sharing operational experience.
- Based on ongoing R&D activities at the nuclear power plants, which are connected to organisation and management.
- Exercised in the spirit of the LearnSafe spin-off activities as work of immediate interest for the initiating nuclear power plants that has a generic interest.

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Proposed research areas for the NoE

Leadership and management. Management and organisation, quality systems, methods and tools for self-assessments and safety reviews, processes of continuous improvements, safety culture, etc.

Communication. Deficient communication is a root-cause for problems, solutions to ensure open and efficient communication internally at the nuclear power plants and between actors within the nuclear field.

Processes for decision making. Structured decision processes for operations, maintenance and plant modifications. Practices to establish authority, responsibility and accountability.

Experience feedback and organisational learning. Benchmarks of event analysis, experience feedback, self-evaluation and continuous improvement processes. Facilitators and hindrances of organisational learning.

Competency. Management of generation change, methods for maintaining and improving competency, leadership training.

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Conclusions

Human and organisational factors (HF/OF) have an influence on nuclear safety!

- There is a need for new structures in thinking, theories and models as well as for methods and tools in the area of HF/OF
- There are lessons to be learned from the similarities and differences between the NPPs in Europe
- There is a benefit of sharing experience and the sharing of practices of safety management should be non-controversial
- The interactions between researchers and practitioners as well as between the countries are important
- A platform for a continuation of the research has been created in the LearnSafe project