

Geschäftsstelle

Kommission
Lagerung hoch radioaktiver Abfallstoffe
gemäß § 3 Standortauswahlgesetz

Arbeitsgruppe 3
Entscheidungskriterien sowie Kriterien
für Fehlerkorrekturen

Beratungsunterlage zur 20. Sitzung der AG 3 am 23. März 2016
Vortrag zum Thema „Selbsthinterfragende Systeme“

Selbsthinterfragende Systeme

Präsentation von Prof. Dr. habil. Oliver Sträter,
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Organisationspsychologie

<p>Kommission Lagerung hoch radioaktiver Abfallstoffe K-Drs. /AG3-117</p>
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Selbsthinterfragende Systeme

Vortrag für die Kommission Lagerung hoch radioaktiver Abfallstoffe

23.3.2016

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Das psychologische Problem des Hinterfragens

'Top down' / konzeptgetrieben

Resultate kognitiver Aspekte:

- Weglassen von Informationen die nicht ins eigene Bild passen
- Negative Bewertung anderer Meinungen
- Nicht Hereinlassen von Alternativen (group think; Wagenburgmentalität)

Vergleich & emotionale Wirkung

zielbasiertes Vorgehen

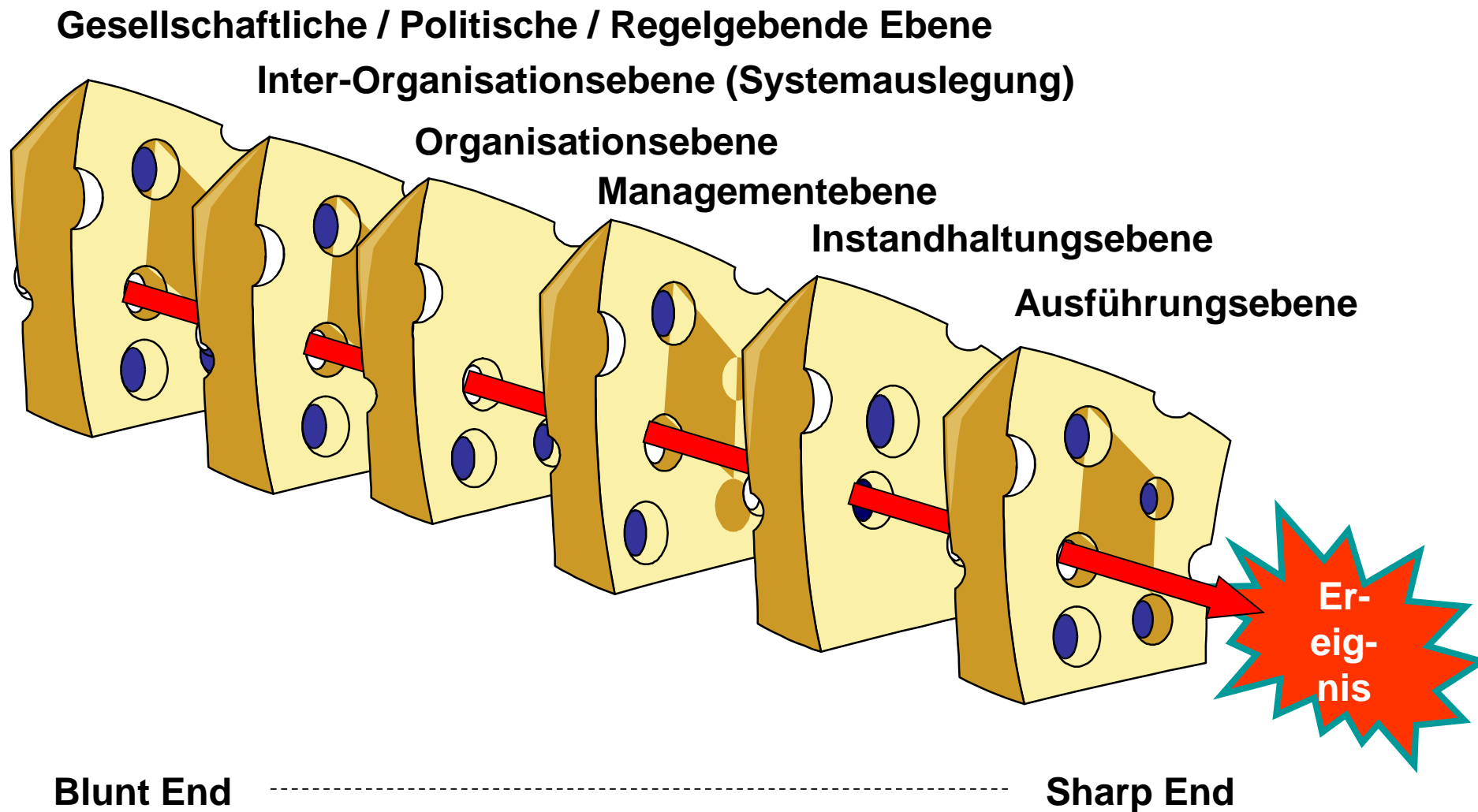
Be-/Abwertung bzgl. eigener Sichtweise

Weglassen von Information

Mangelnde Erkennung von Erfordernissen

'Bottom up' / wahrnehmunggetrieben

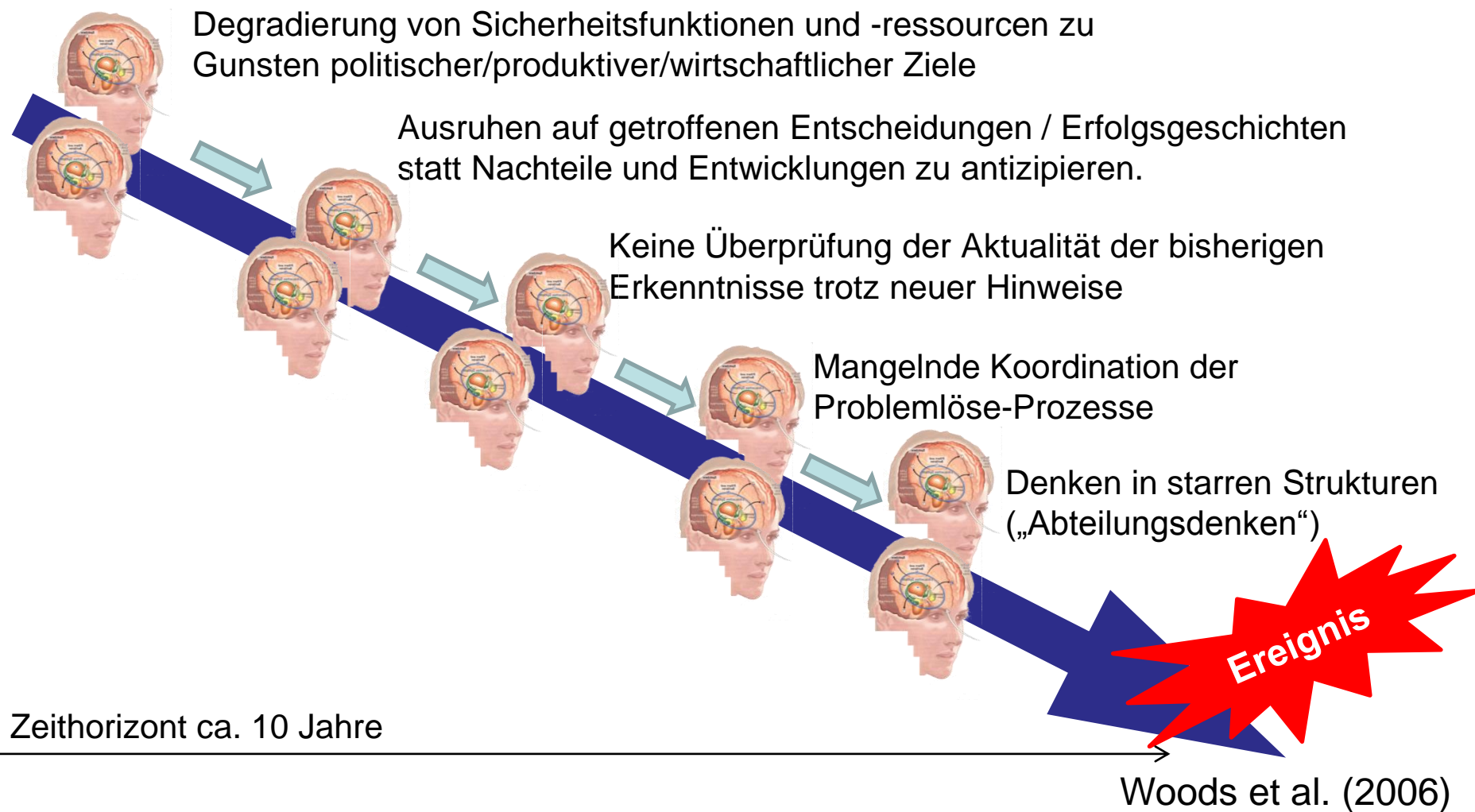
Problemraum: Arbeitsebenen eines Systems



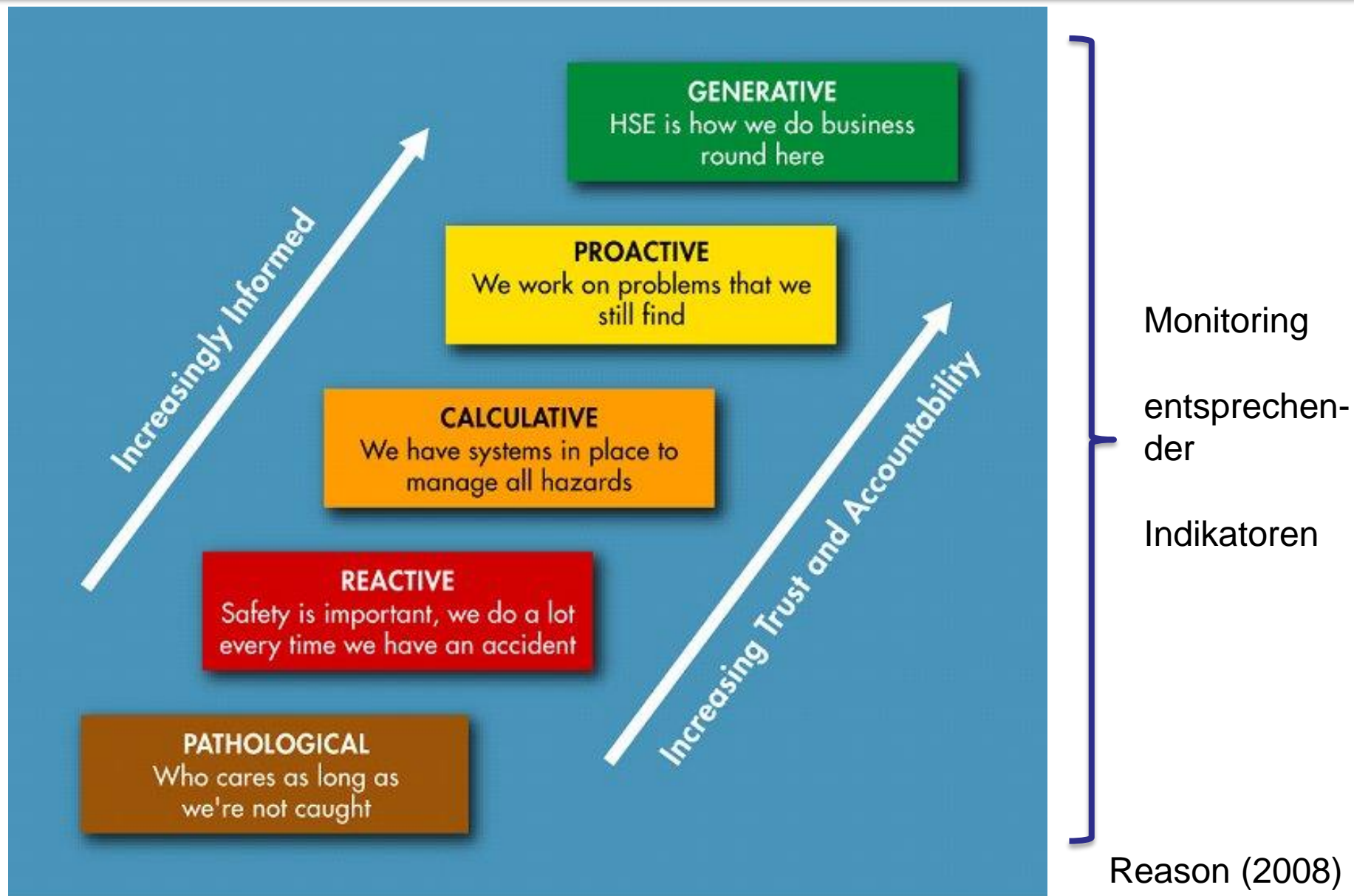
(Reason, 1997; Leveson, 2002; Hollnagel, 2005)

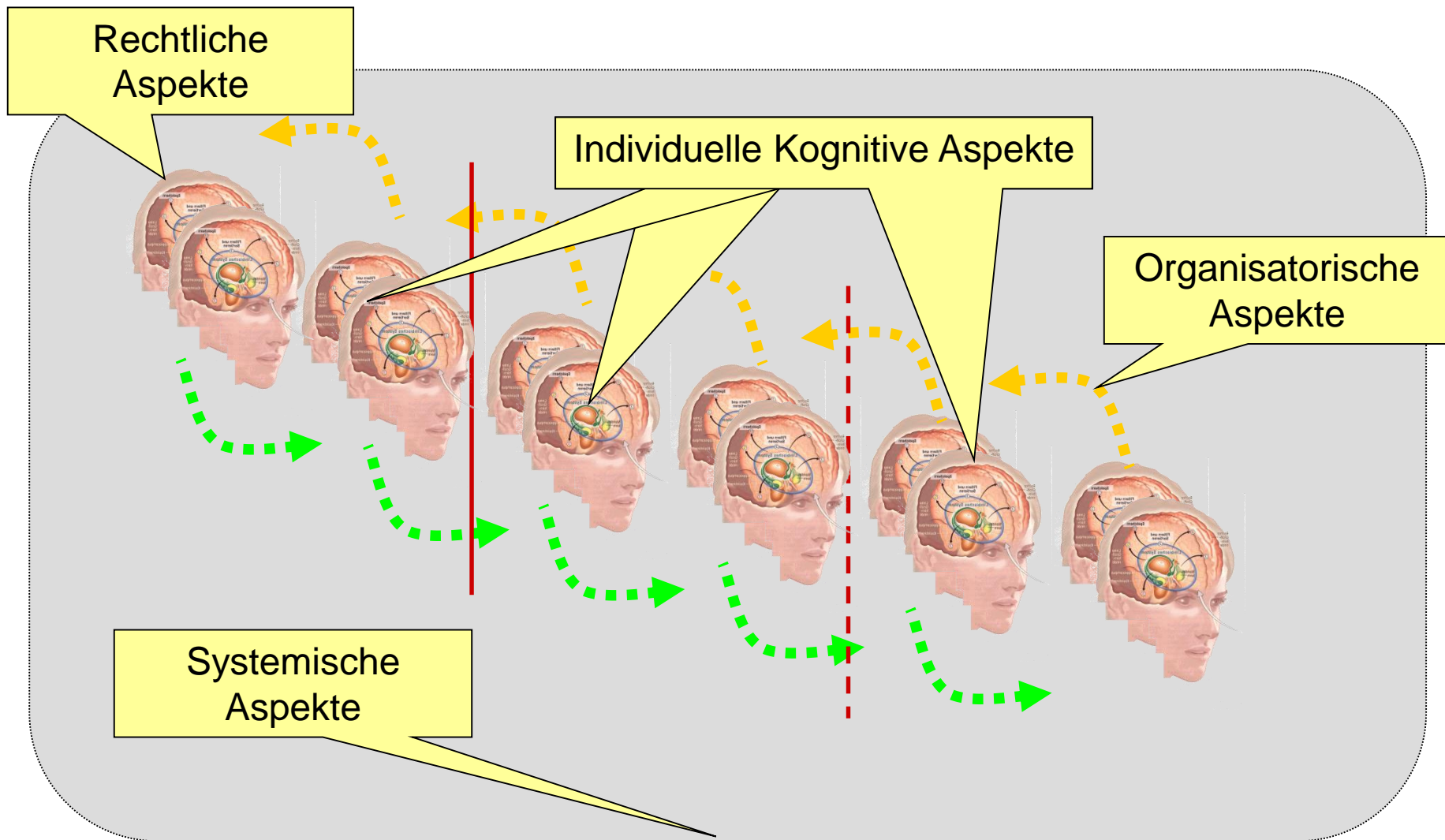
Langfristige Wirkungen mangelnden Hinterfragens

„Drift into Failure“ Konzept



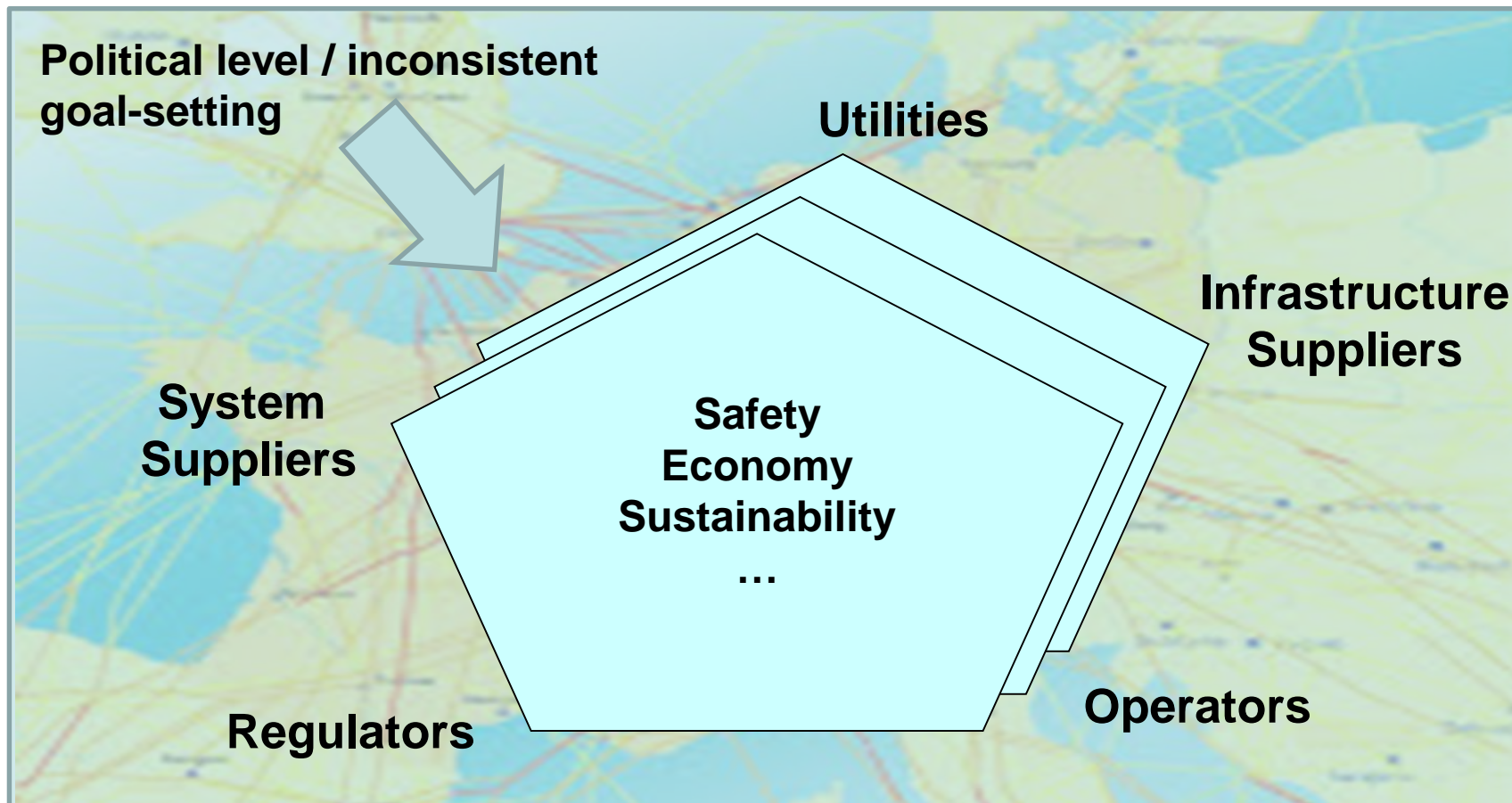
Ziele / Reifegrade selbsthinterfragender Systeme





- Individuum
 - Situationsbewusstsein
 - Psychische Gesundheit
 - Workload Management
- Organisation
 - Kommunikation, Führung & Teamwork
 - Sicherheitsmanagement & Sicherheitskultur
 - CRM (Crew Ressource Management)
- System
 - Resilienz & Verhaltensvariabilität
 - Threat and Error Management
 - Entscheidungsfindung, Safety Scanning

Enhancing the Interaction between Workinglevels



- Multiple interests and understandings on what is the 'best' solution for safety
- Conflicting intentions leading to safety culture issues (neglect, avoidance)
- High potential of "intentional behavior" instead of managing facts

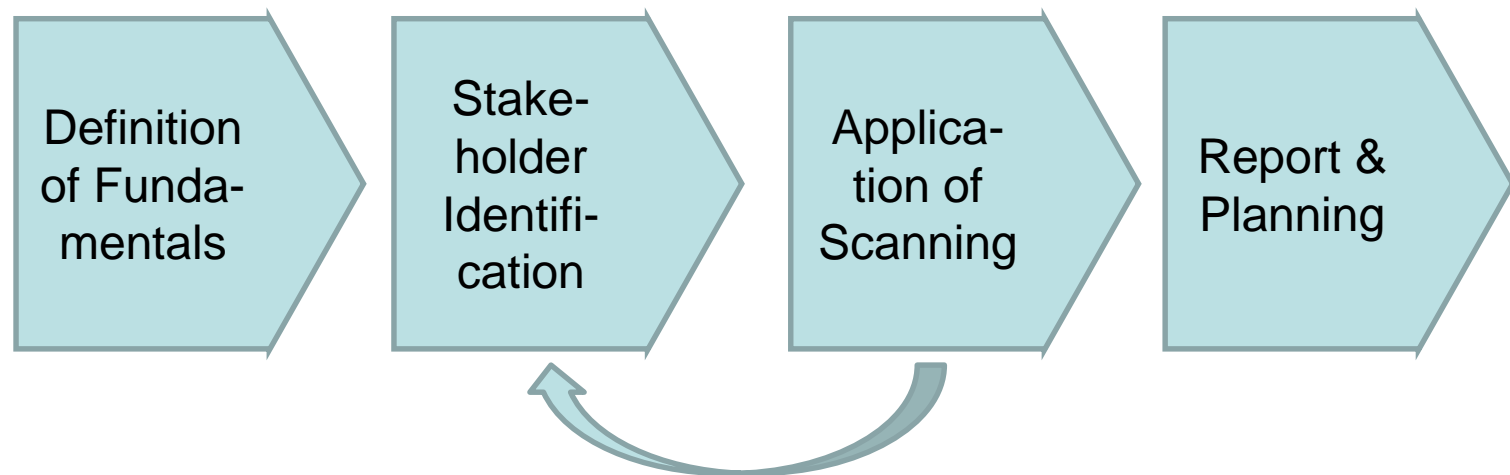
Safety Scanning Technique to manage intentions

Safety Scanning Technique (SST)

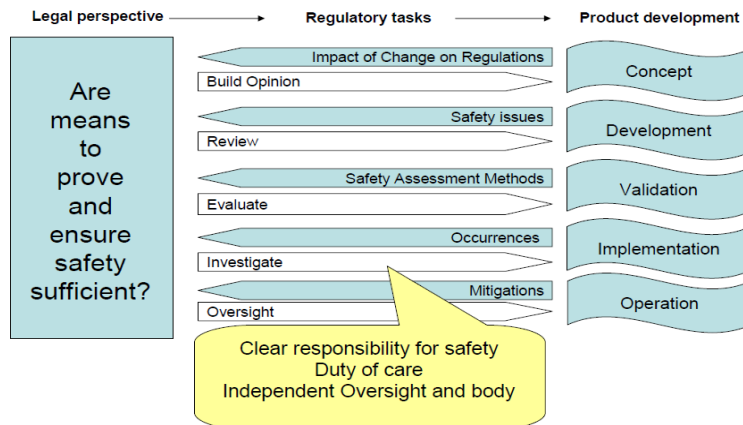
- Provides a means to **openly share knowledge** and experience
- Provides a means to better **understand mutual concerns**
- Works out **inter-organisational conflicts**
- Provides input into inter-organisational **conflict-solving**

General Process

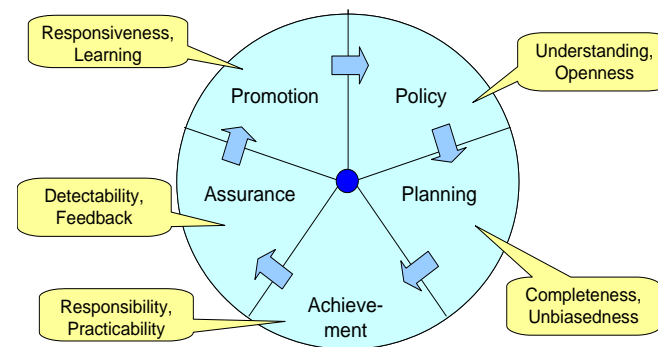
- A facilitated / moderated process involving **all stakeholders**
- Continuous application / **safety monitoring** throughout development phase



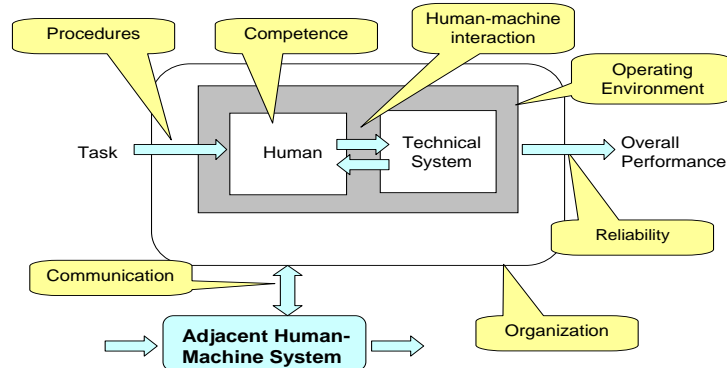
Regulations / Standards



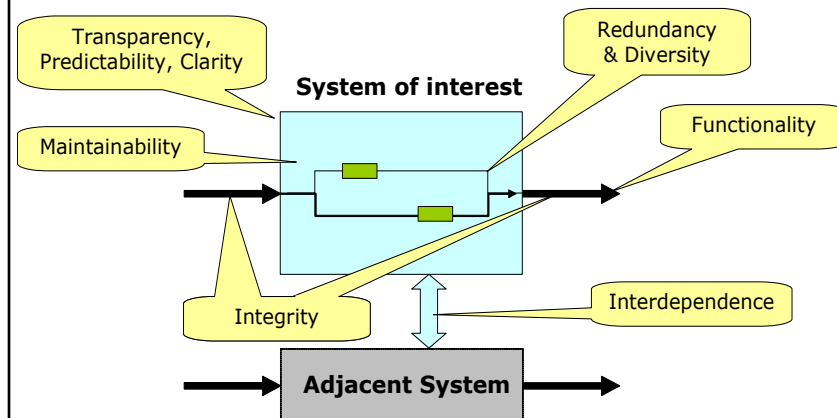
Safety Management



Operational Safety



Safety Architecture



Experiences & Example

- EU applications: Galileo, Free Flight Concept, Airspace design, also: Railway-Restructuring, ...
- Establishment of a joint civil/military Airspace Flow Management Unit (AFMU) in the Netherlands, aiming at flexible use of airspace

– Participants:

- 1 Military policy maker
- 1 Civil policy maker
- 1 AFMU concept developer
- 3 Civil regulator
- 2 Civil ANSP
- 2 Military ANSP
- 1 Moderator
- 1 Co-moderator



Safety Scanning tool – A Moderation Tool

Explanation

Question

Safety fundamental applicable to this page of questions

Possible answers

Room for providing justification

Question navigator

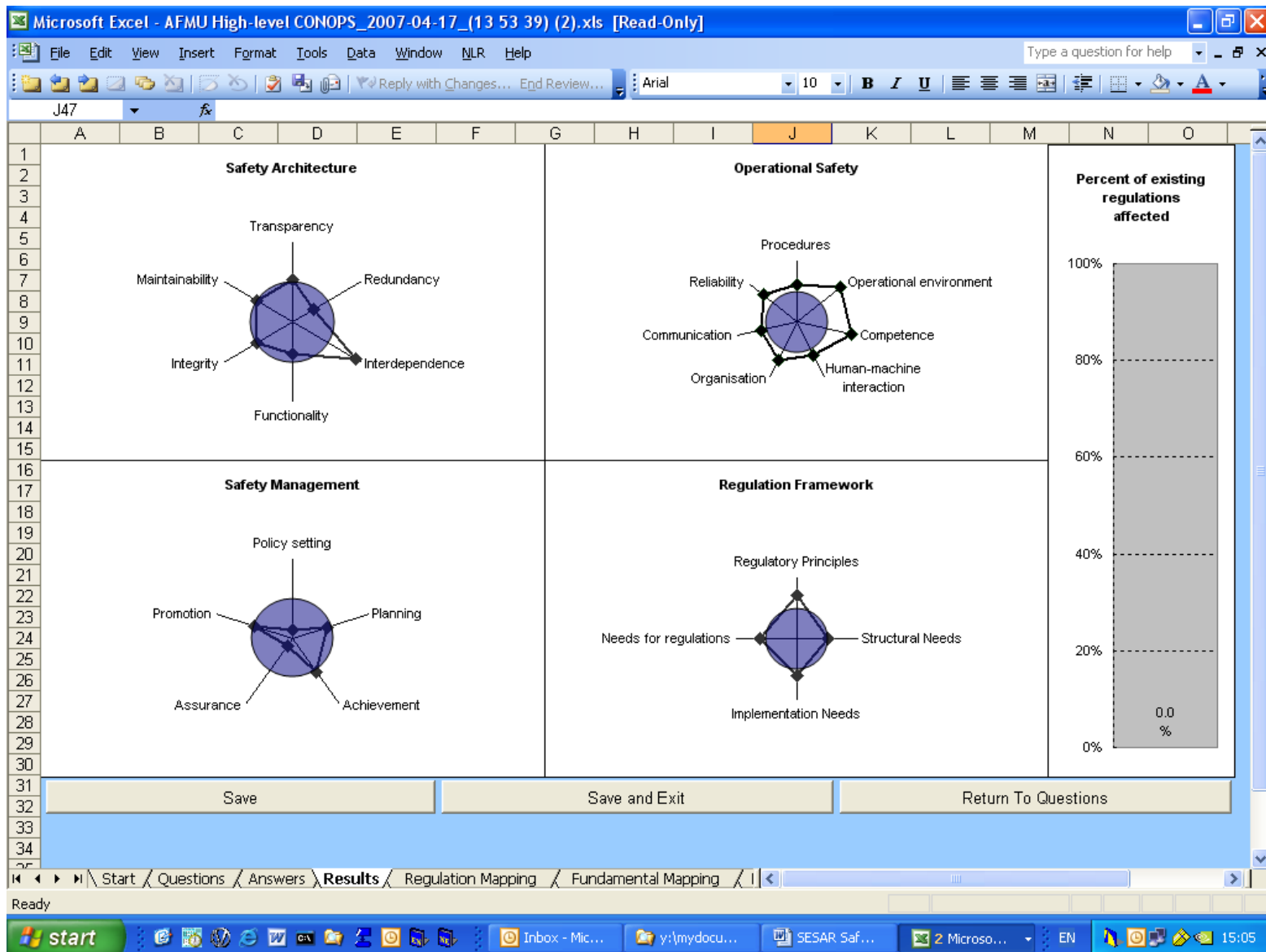
High-level question

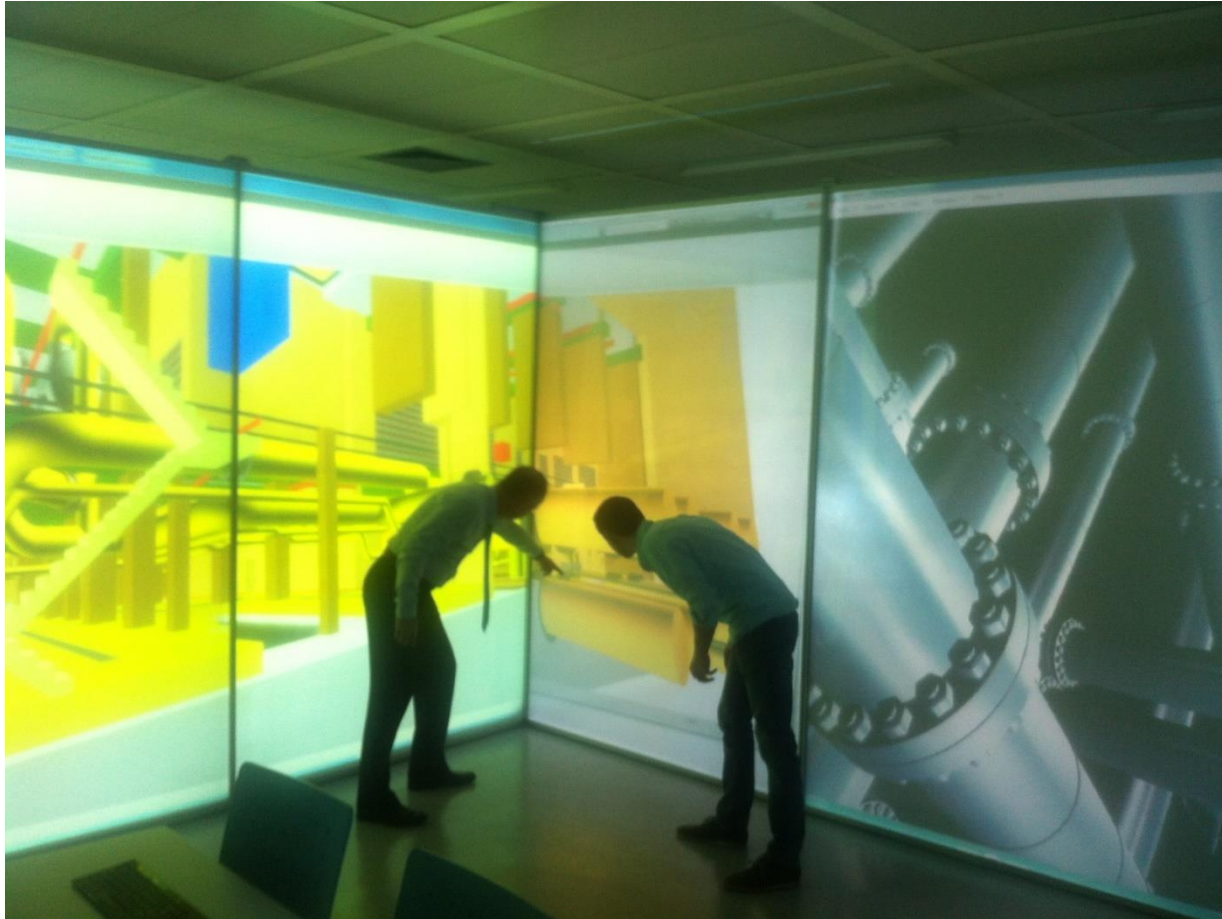
Low-level questions

The screenshot shows the 'Safety Scanning tool' interface. On the left is a 'Question Navigator' tree with categories: User Details, General, Introduction, Safety architecture (containing Transparency, Redundancy, Interdependence, Functionality, Integrity, Maintainability), Operational safety, Safety management, Regulation framework, Existing regulations, and Finish. The main area displays a 'Transparency' section with five questions. Each question has a title, a description, a 'Please enter your answer justification' field, and a set of radio button answers. The questions are: 2) Is the description of the Subject transparent, clear and complete?*, 2.1) Is there already a clear proposal on how to design the Subject?, 2.2) Is the documentation of the Subject clearly understandable?, 2.3) Are there different opinions on how the Subject might work in detail?, and 2.4) Are there preconceptions or decisions that have already been taken, while alternatives have not been sufficiently thought-through?. The interface includes a 'Progress through questions' bar at the bottom with 'Back', 'Finish', and 'Next' buttons. Annotations with red arrows point to various parts: 'Explanation' points to the question description; 'Question' points to the question title; 'Safety fundamental applicable to this page of questions' points to the 'Transparency' header; 'Possible answers' points to the radio button options; 'Room for providing justification' points to the justification text area; 'Question navigator' points to the left-hand tree; 'High-level question' points to question 2; and 'Low-level questions' points to questions 2.1 through 2.4.

Question	Answer	Justification
2) Is the description of the Subject transparent, clear and complete?*	<input type="radio"/> No <input type="radio"/> Possibly <input type="radio"/> Yes	Please enter your answer justification
2.1) Is there already a clear proposal on how to design the Subject?	<input type="radio"/> No <input type="radio"/> Possibly <input type="radio"/> Yes	Please enter your answer justification
2.2) Is the documentation of the Subject clearly understandable?	<input type="radio"/> No <input type="radio"/> Partially <input type="radio"/> Yes	Please enter your answer justification
2.3) Are there different opinions on how the Subject might work in detail?	<input type="radio"/> No <input type="radio"/> Possibly <input type="radio"/> Yes	Please enter your answer justification
2.4) Are there preconceptions or decisions that have already been taken, while alternatives have not been sufficiently thought-through?	<input type="radio"/> No <input type="radio"/> Some <input type="radio"/> Yes	Please enter your answer justification

Example result





**Moderation
konfligierender
Ziele**

**Virtuelle
Begehungen**

**Sichere
Arbeitsplanung**

1. Hohe Relevanz von zielbezogenem Verhalten

-> Safety Scanning für die Planung und den Entscheidungsprozess

2. Klassische (organisationsbezogene) Sichtweise reicht nicht

-> Übergreifende gesellschaftliche / organisatorische Fragestellungen

3. Interorganisationale Aspekte beeinflussen Wirksamkeit selbsthinterfragende Systeme

4. Langfristigkeit der Problematik

-> Qualifikationsaspekt der Personen auf den Arbeitsebenen des Systems

5. Hohe Bedeutung eines systematischen Monitoring hinsichtlich des Reifegrads bzgl. Selbsthinterfragung auf allen Arbeitsebenen

Zur Person

- Hintergrund: Kerntechnische Sicherheit und Begutachtung hinsichtlich MTO Aspekten (1992-2002)
 - Promotion über Ereignisanalyse und menschliche Zuverlässigkeit
- Leitung des VDI Arbeitskreises Menschliche Zuverlässigkeit und Sicherheit
- Verantwortlicher für die Sicherheitsfragen des Single European Sky 2004-2008
- RSK Unterausschuss Reaktorbetrieb (2003-2011)
- Expertengruppe Reaktorsicherheit (ERS) der ENSI/Schweiz seit 2011
- Mitglied des Ausschusses Betriebssicherheit des BMAS seit 2015
- Professur mit Schwerpunkt ‚Systemische Sicherheit‘ seit 2008