

SAFETY INVESTIGATIONS: ACHIEVE INCREASED TRANSPARENCY AND DEEPER LEARNING

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SAFETY INVESTIGATIONS: EXPECTATIONS & REALITY

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SAFETY INVESTIGATIONS: UNNAMED PROJECTS

- Implicit or explicit boundaries: scope, schedule and costs
 - According to standards:
 - the scope is open; no bottom, up, left, right, in, out limits
 - but, also there are no criteria to assess the depth and extent of investigations
 - Is the scope really widely open?
 - Political influences
 - Emotional effects
 - Etc.

SAFETY INVESTIGATIONS: UNNAMED PROJECTS

- Are there any schedule and cost limits?
 - Yes and no: it depends on the organisation/State
 - There is always a starting date but can the completion date be really decided beforehand?
 - Military aviation records investigation costs more frequently than civil aviation
- Any other limits?
 - Investigation team's skills, experience and human performance boundaries
 - The techniques and methods used
 - The quality of evidence and data along with their processing

SAFETY INVESTIGATIONS: UNNAMED PROJECTS

- In reality:
 - Boundaries exist but not explicitly stated: safety is over all – who dares to constrain the investigators?
 - All investigations have inherent, predefined or emerging limitations
 - Limitations means assumptions, and making assumptions means imperfections



SO WHAT...?

- If limitations and their corresponding assumptions are not documented:
 - We actually claim that we performed a “perfect” investigation
 - Our investigation report can be less credible and more open to disputes
 - We do not give the opportunity for meta-studies to collect information to be used for decreasing limitations
 - People involved do not understand why we stopped at them and we did not proceed further, deeper etc.: they view our report as “unfair”.



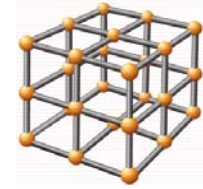
HERE IS THE QUESTION

How can we improve the depth, fairness and effectiveness of investigations within given and emerging limitations?



EVOLUTION IN SAFETY THINKING

- Accident causation models: from root cause, to epidemiological and systemic approaches.
- New views on human error: from blaming, to understanding end-user's decisions and actions.

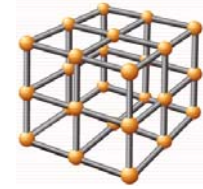


HUMAN ERROR SEEN AS SYMPTOM

Traditional View	New View
Human Error is seen as the principal cause of accidents.	Search for factors that led to Human Error.

(Dekker, 2006)

- **Thinking further:** It is widely reported that human errors contribute as causal factors to 70%-80% of the safety events.
 - Humans design, manufacture and operate systems! Human error is 100% present!
 - Human error will always be a causal factor in all events. The proximity changes!

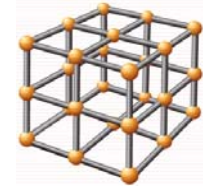


HINDSIGHT BIAS AVOIDANCE

Traditional View	New View
Looking to the event backwards and simply recording errors, inaccurate assessments and wrong decisions.	Consider why choices made sense to users at that time, and what options they had prior to the accident.

(Dekker, 2006)

- **Reminder:** People act with given resources and capacity
- Maybe if they hadn't done something wrong, they could have done something else wrong, which now was performed right!

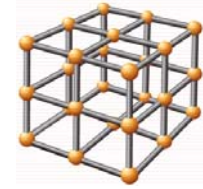


SHARED RESPONSIBILITY

Traditional View	New View
Focus on end-user(s) without exploring influences of other organizational levels.	End-user is not the focal point; organizational factors are also investigated.

(Catino, 2008; Dekker, 2006)

- **Reminder:** Rasmussen discussed also about the effects of regulators, authorities and governments
- Is there a “stopping” rule?

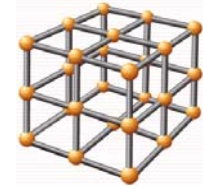


NON-PROXIMAL APPROACH

Traditional View	New View
Shared responsibility might be discussed, but investigators persist on investigating in detail the end-user level.	Proportional investigation depth of all organizational functions.

(Dekker, 2006)

- **Check:** How much time is spent and how much space has been devoted in the reports when addressing organisational and other layers?
- Are these equivalent to the ones regarding the work floor?

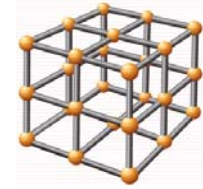


DECOMPOSITION OF FOLK MODELS

Traditional View	New View
Abstract statements are named as causes (e.g., culture, complacency).	Decomposing and explaining the constructs.

(Dekker & Hollnagel, 2004; Dekker, 2006)

- **Advise:** there is almost no value to name constructs as causes; they don't really exist, so they cannot cause anything.
- It's convenient to use folk models as scapegoats, but this does not add anything to our knowledge.

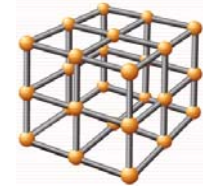


NON-COUNTERFACTUAL APPROACH

Traditional View	New View
Merely comparing human performance against standards and procedures.	Exploring the reasons for deviating from standards. Examining the assumptions that the standards were based on.

(Dekker, 2006)

- **Reminder:** standards cannot change with the pace of real life and cannot capture dynamic behaviours.
- There is little value in shifting the blame from end-users to managers and regulators: help the system understand and evolve safely!

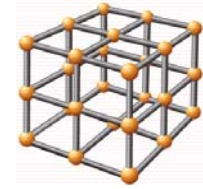


NON-JUDGMENTAL APPROACH

Traditional View	New View
Actions are compared with norms and expectations (e.g., knowledge, experience and training).	Exploring the reasons for not meeting expectations. Examining the validity of established norms and expectations.

(Dekker, 2006)

- **Reflect:** How frequently do you judge people based on unspoken and unwritten expectations?
- Remember that past success does not guarantee future performance.

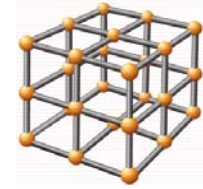


SAFETY-I TOGETHER WITH SAFETY-II

Traditional View	New View
Humans are predominantly seen as a hazard. Emphasis is on explaining failures.	Humans are seen as a resource necessary for system flexibility and resilience. Need to explain successes in addition to failures.

(Hollnagel, 2014)

- **Attention:** Safety-II can be misused!
- Since other people succeeded in the past under same conditions, then you are the problem!

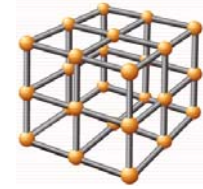


FEEDBACK LOOPS

Traditional View	New View
Feedback mechanisms not systematically investigated.	Feedback mechanisms are considered, so to examine whether/how system awareness and control were maintained.

(Leveson, 2011)

- **Attention:** Need for feedback does not mean bombarding the user with data/information and then blame for insufficient situation awareness and control!
- **Recall:** people have capacity limitations



ACCIDENT MODELS

	Sequential models	Epidemiological models	Systemic models
Search principle	Specific causes and well-defined links.	Carriers, barriers and latent conditions.	Tight couplings and complex interactions.
Analysis goals	Eliminate or contain causes.	Make defences and barriers stronger.	Monitor and control performance variability.

(Underwood & Waterson, 2013; Hollnagel & Goteman, 2004; Leveson, 2004, 2011; Reason et al., 2006)

- **Attention:** Application of simple models to events just confirms that the events were simple!
- Everything can be as much complex or simple as much you want to see it.



CALL TO ACTION

- There is no right or wrong way of investigating as long as you state your limitations and assumptions.
- The application of new safety thinking means deeper learning but also increased investment of resources: everything is a matter of trade-offs!
- You can use the safety thinking aspects to “self-check” your investigation’s process and report.
- Use the results of your self-check to improve your investigations (within the external boundaries!) and formulate the limitations of your own work.
- New safety thinking is not only about investigations: it is about shifting our minds and changing ourselves; it extends across all personal and vocational activities!

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Thank you!

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CREATING TOMORROW

