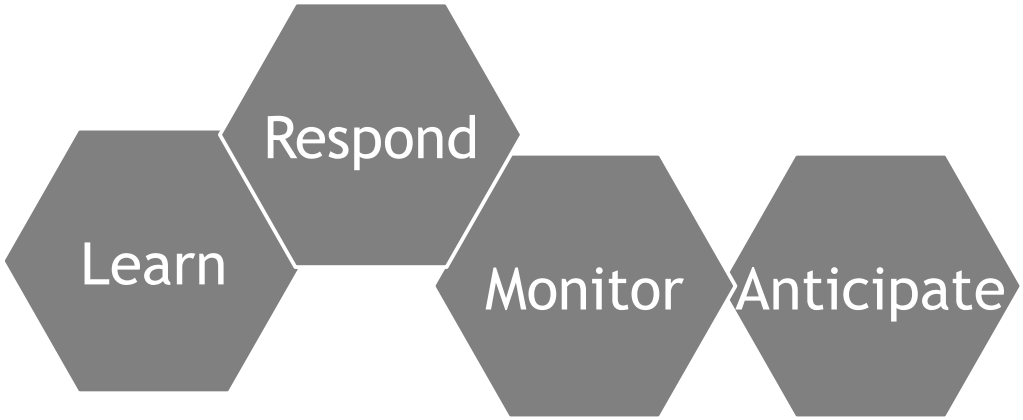
From safety culture to Systemic potentials management



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Structure of presentations

Part 1. A critical historical perspective on Safety Culture

Part 2. What is Resilient performance, and how can it be managed?

Overview of presentation(s)

Part 1. A critical history of Safety Culture

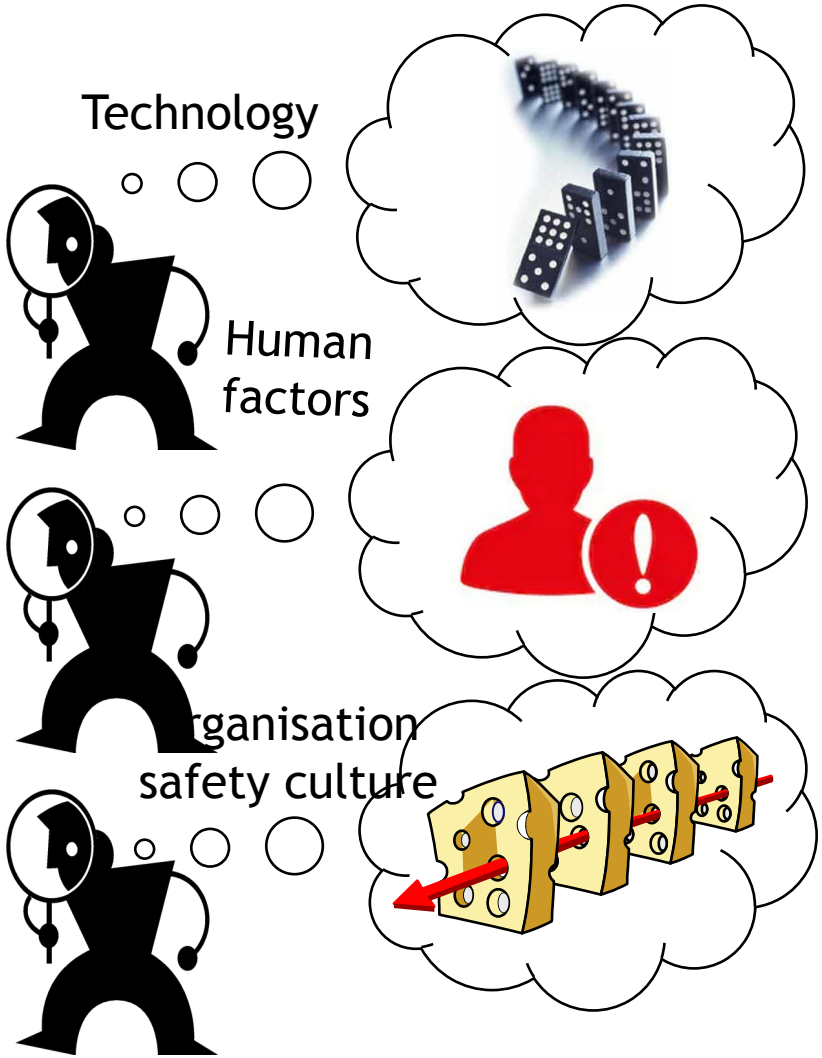
Safety cuture:It's Origin, Theoretical and empirical basis

Failures and accidents need explanations

When something goes wrong …
we try to find a (root) cause

Tinnitus!

Where are
my earrings?



Three kinds of explanations

Factual cause

It **was** there.

If this had NOT happened!

Technical failure
Natural disturbance
External disruption

Then all would have been well.

Hypothetical causes

We **think** it was there

If this had NOT happened!

"Human error"
Organisational blindness

Then all would have been well.

Counterfactual causes

There was a lack of this!

If only we can have MORE of this

Safety culture
Situation awareness
Resilience

Then all will be well.

Factual causes

Factual cause

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Natural disturbance
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Organisational blindness

Then all would have been well.

Counterfactual causes

There was a lack of this!

If only we can have MORE of this

Safety culture
Situation awareness
Resilient safety

Then all will be well.

What is a contrafactual conditional?

Counterfactual conditionals are conditional sentences which discuss what would have been true under different circumstances, e.g. "If Peter believed in ghosts, he would be afraid to be here

Or if **A** had not been the case**, B** would not have happened:
A: a lack of safety culture **B:**the accident

Thus if there hadn't been a lack of safety culture, the accident would not have happened Or if **A** had not been the case**, B** would not have happened:
A: a lack of safety culture/situation awareness trust communication **:**the accident would not have happened

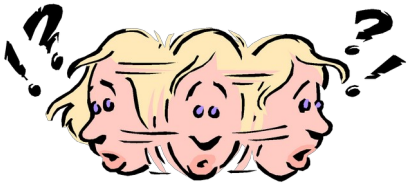
contrafactual conditionals are often used to propose explanations for the unusual cases

Five eras of safety thinking

Safe tysyn thesis

Always a focus on accidents
and a search for causes

Feel safe!



Be safe!

1698 (Steam engine) 1979 (TMI) 1986 (Chernobyl, Challenger)

"Acts of god" → Technical failures → Human Factors → **Safety culture** → Complex systems

Unwanted outcomes have always been explained by looking for causes.
The types of causes have changed as societies have developed.

A 3-stage safety development "model"

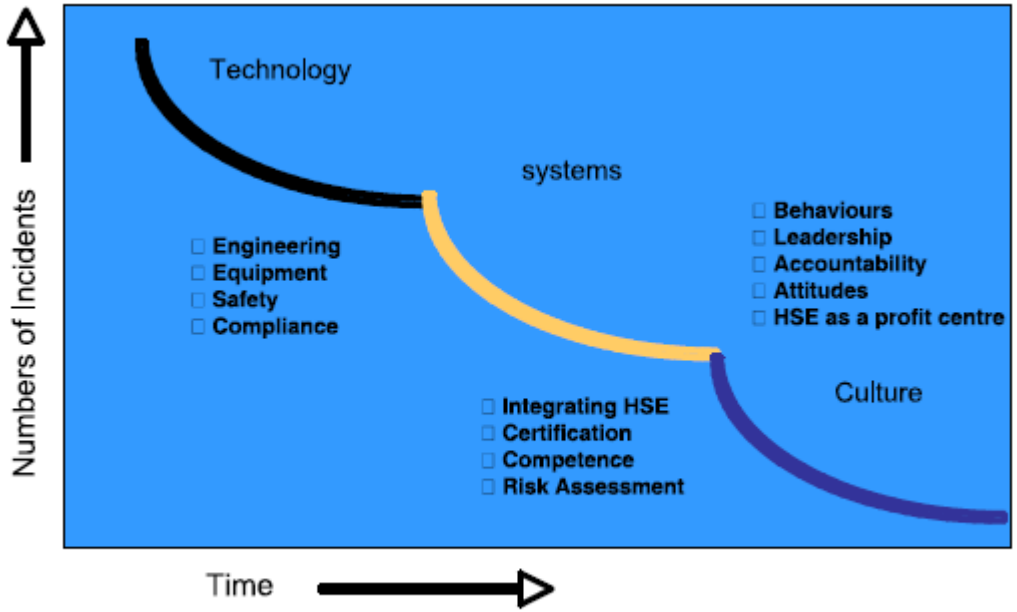
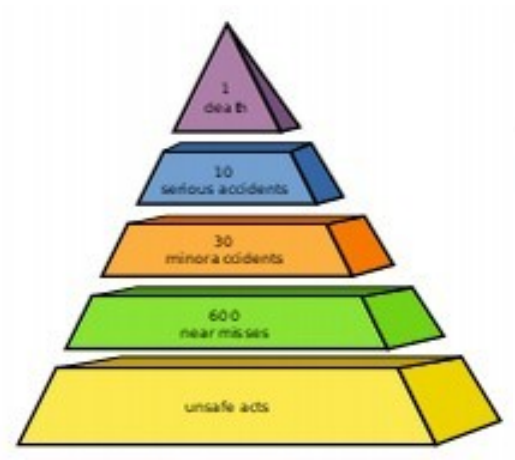


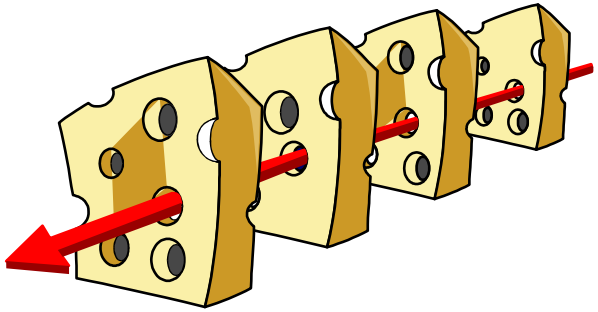
Fig. 1. The developmental line, culture becomes the next wave after systems safety.

How we usually look at accidents

Safety outcomes



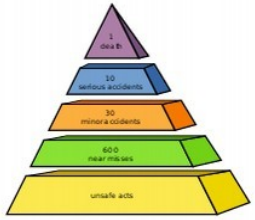
Safety "mechanisms"



Five common myths – that all are wrong

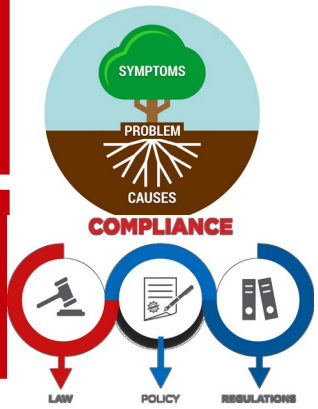
Myth #1: All accidents have causes which can be found and fixed.

Myth #2: Different types of adverse outcomes occur in characteristic ratios.



Myth #3: Human error is the major contribution to accidents and incidents.

Myth #4: Accident investigation is a rational search for root causes.



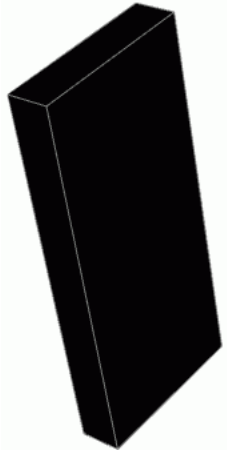
Myth #5: Systems will be safe if people comply with procedures / standards.

Five common myths rebutted

Safety synthesis

Myth #1: All accidents have causes which can be found and fixed.	Unwanted outcomes do not have unique causes. Things that go wrong and things that go right happen in the same way.
Myth #2: Different types of adverse outcomes occur in characteristic ratios.	Outcome categories are ambiguous. Ratios are not meaningful and graphics can be misleading.
Myth #3: Human error is the major contribution to accidents and incidents.	"Human error" treats humans as (fallible) machines and disregards role of performance adjustments.
Myth #4: Accident investigation is a rational search for root causes	Accident investigation is a social process; causes are constructed rather than found.
Myth #5: Systems will be safe if people comply with procedures / standards.	WAI always differ from WAD. Strict compliance is detrimental to both safety and efficiency.

We prefer trivial explanations



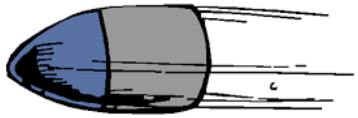
Humans prefer trivial causes that rely on a **single** concept or factor. As social constructs, trivial explanations are efficient (easily made and accepted) but lack in thoroughness and precision.

Trivial causes reinforce a trivial understanding of the world

Captain Hindsight

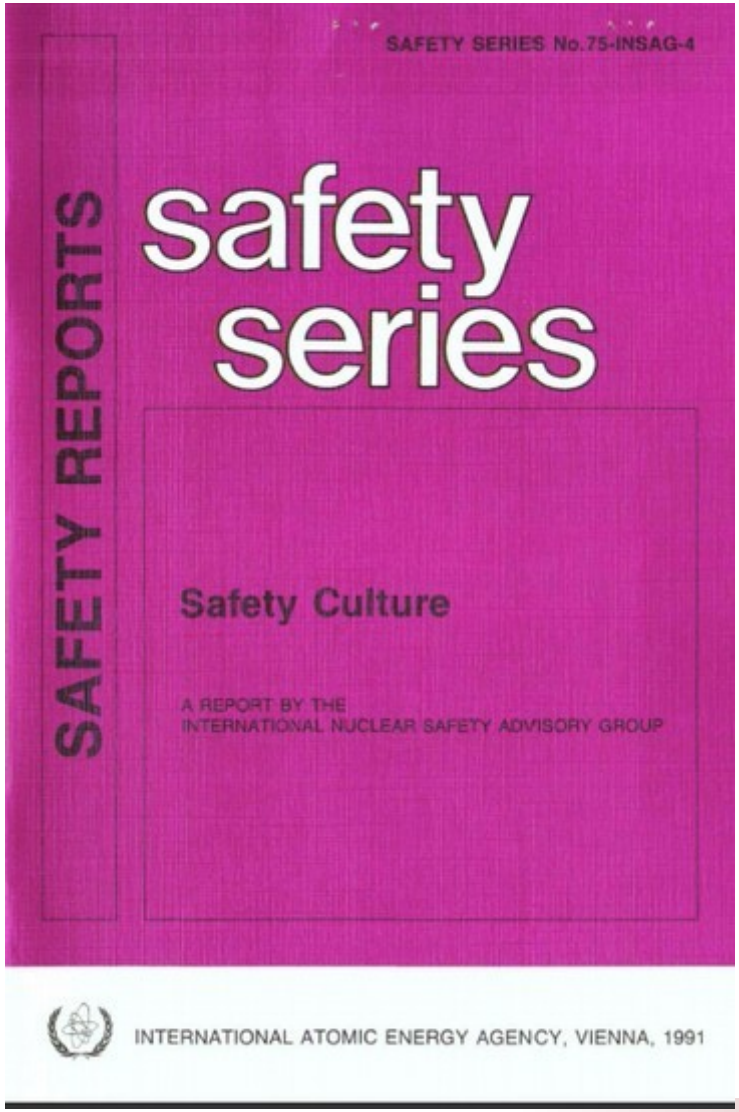
Trivial **problems**
Technology
Human Factors
Deviations
Drift into danger
Complexity
safety culture

Trivial **solutions**
Design, materials
maintenance
Training, design
automation
Compliance
Monitoring,
leadership
Complexity
Improve safety
culture



The Silver Bullet

Lack of Safety culture as a trivial cause



The term 'Safety Culture' was first introduced in INSAG's Summary Report on the Post-Accident Review Meeting on the Chernobyl Accident, published by the IAEA as Safety Series No.75-INSAG-l in 1986, and further expanded on in Basic Safety Principles for Nuclear Power Plants, Safety Series No.75-INSAG-4, issued in 1988.

Safety culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance. A distinction can be made between organisational culture (beliefs and values that are shared by most members within the organisation) and organisational climate (common characteristics of behaviour and expression of feelings by organisational members)

From safety climates to culture levels

Safetysynthesis

Westrum (1996) – and earlier: → Hudson & colleagues (1999) – and later:

A continuous range of safety climates, defined by typical leadership styles.

Pathological

Bureaucratic

Generative

Five discrete levels of safety culture.

- Pathological
- Reactive
- Calculative
- Proactive
- Generative

Safety climate: the collective view of safety in an organization as seen by recent or current events.

Safety culture: "The way things are done around here"

From range of climates to culture levels

Safe tysyn thesis

Westrum (1996) – and earlier:
A continuous range of safety climates, defined by typical **leadership styles**.

Pathological

↑

Bureaucratic

↓

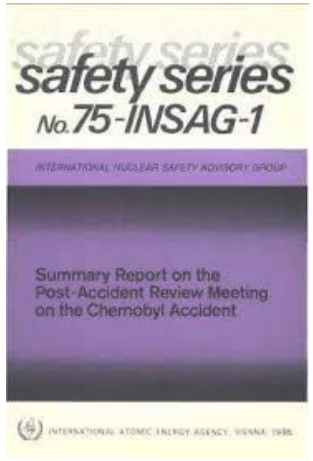
Generative

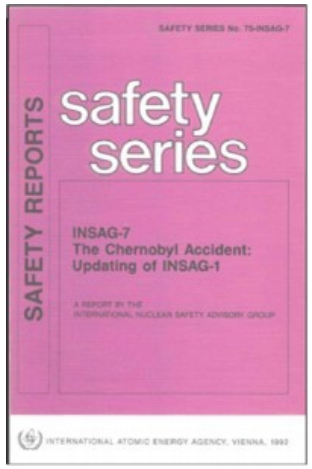
PATHOLOGICAL	BUREAUCRATIC	GENERATIVE
Power oriented	Rule oriented	Performance oriented
Low cooperation	Modest cooperation	High cooperation
Messengers "shot"	Messengers neglected	Messengers trained
Responsibilities shirked	Narrow responsibilities	Risks are shared
Bridging discouraged	Bridging tolerated	Bridging encouraged
Failure => scapegoating	Failure => justice	Failure => inquiry
Novelty crushed	Novelty => problems	Novelty implemented

Westrum, R. (2004). A typology of organisational cultures. *Qual Saf Health Care, 13*

Safety climate: the collective view of safety in an organization as seen by recent or current events.

Is "safety culture" a trivial solution?





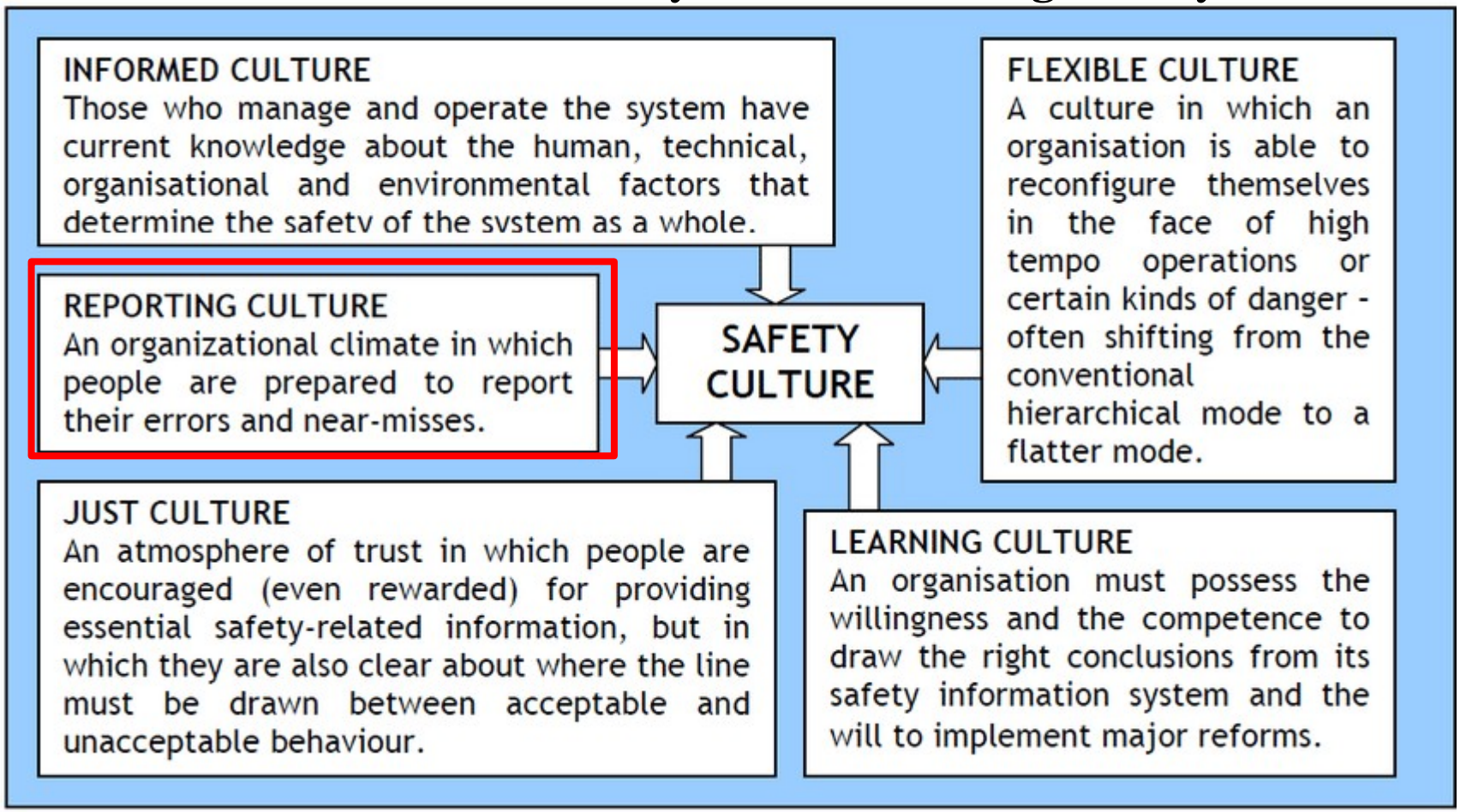
INSAG-1 (1986) supported the view, based on the data provided by the Soviets and specialists that accident was caused by gross violations of operating rules and regulations. "During preparation and testing of the turbine generator under run-down conditions using the auxiliary load, personnel disconnected a series of technical protection systems and breached the most important operational safety provisions for conducting a technical exercise." **INSAG-7** pays close attention to the inadequate "culture of safety" **at all levels.** Deficiency in the safety culture was inherent not only at the operational stage but also … during … other stages in the lifetime of nuclear power plants (including design, engineering, construction, manufacture, and regulation).

But If "safety culture" is an issue at all levels, then it is no longer a trivial problem with a trivial solution!

Decomposing safety culture 1/2

Safe tysyn thesis

Does this make it any easier to manage safety culture?



Is just culture a missing element?

If safety depends on people reporting what goes wrong ...

… then they need to be protected against possible blame.

There is therefore a need of a **just culture**

...safety performance is measured through a comprehensive incident reporting and investigation process. Safety incidents ... are reported through the Mandatory Occurrence Report scheme operated by the CAA's Safety Regulation Group (SRG), and investigated and assessed by both NATS and, if necessary, by the SRG. NATS is committed to maintaining a "just" reporting culture to ensure that all safety related incidents continue to be reported and investigated.

NATS is committed to maintaining a "just" reporting culture to ensure that all safety related incidents continue to be reported and investigated.

(We) are committed to a "just" safety culture that encourages the free and honest reporting of safety incidents and concerns ...

NATS – Strategic Plan for Safety - 2004

Levels of safety culture (Hudson, 1999)

Generative	We are all involved in this together. Safety is part of our self image.	Acceptance, responsibility
Proactive	We want you to get ahead of the game. Let us know when you have finished	Delegate, specialise
Calculative	We calculate the odds based on what went wrong the last time	Rational economic
Reactive	We are WORRIED about safety – (but we don't do anything!)	Management double-bind
Pathological	Who cares, as long as we are not caught (by the regulator), or have a serious accident?	"Laissez faire"

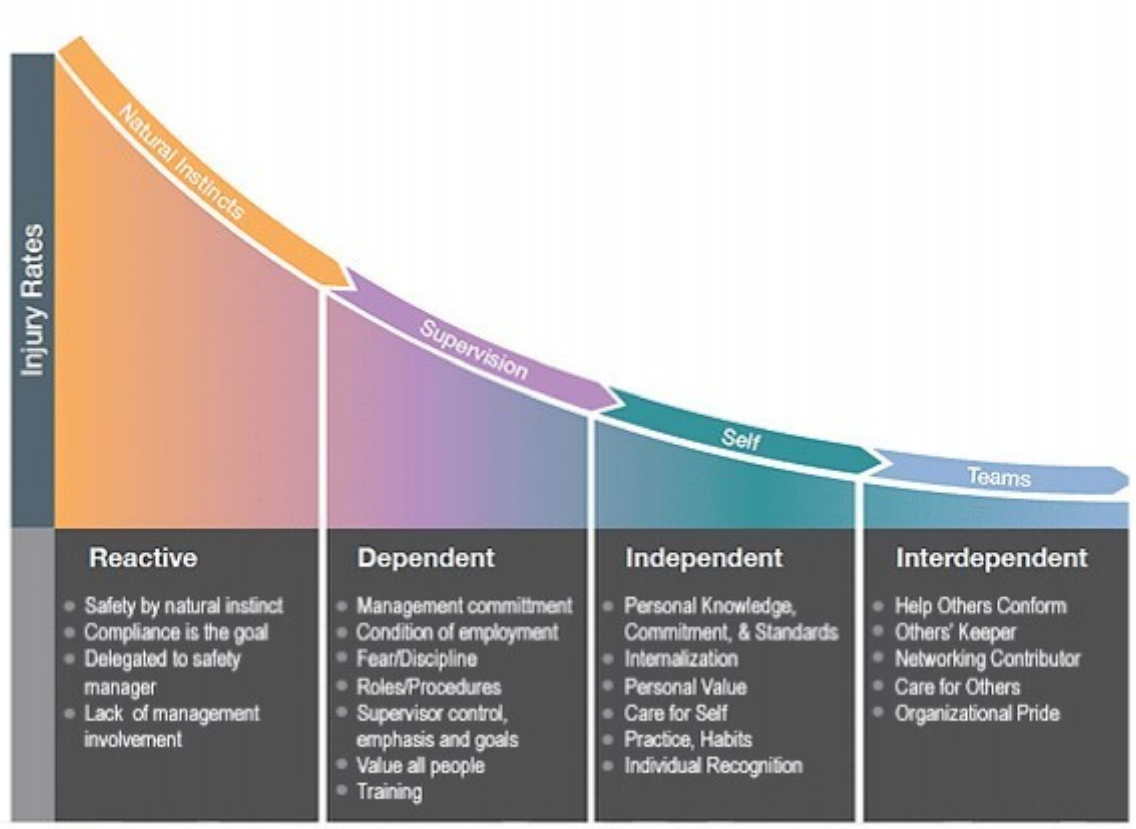
Basic risk management maturity chart

Decomposing safety culture 2/2

1. Management commitment to safety
2. Job satisfaction
3. Training, equipment, physical environment
4. Organizational commitment
5. Worker involvement
6. Co-worker support
7. Performance management
8. Personal accountability

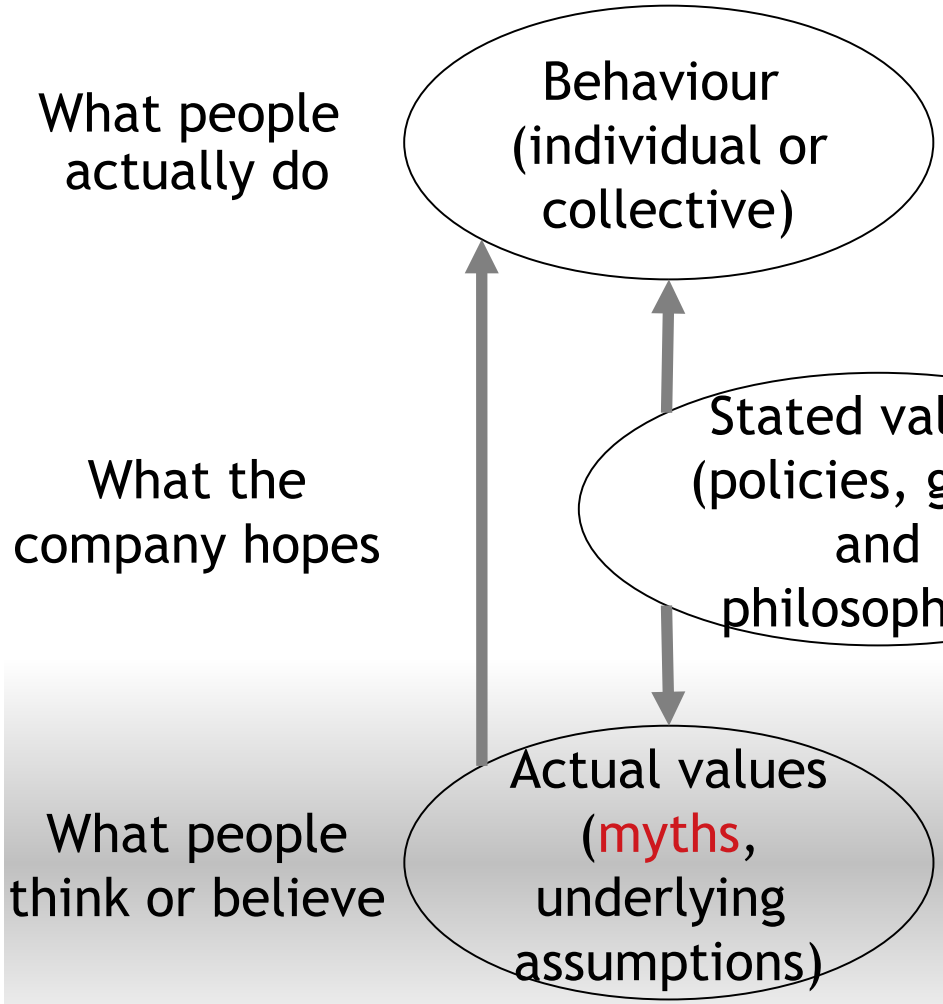
Are these factors independent and do they make it any easier to manage safety culture?

An even more oversimplified version"The Dupont "Bradley Curve"



what is safety culture exactly?

After Schein (1996)



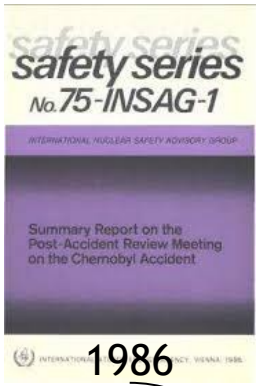
The **actual behaviour** under expected and unexpected conditions (choices, actions, trade-offs)

Stated or desired cultural elements, often provided by the CEO or management, e.g., 'Safety First'

The shared assumptions about "the world" that determine how people perceive, think, feel, and act

Origins of organisational culture

1805-15
Esprit de corps
(Grande Armée)



1986

1987
High Reliability
Organisations

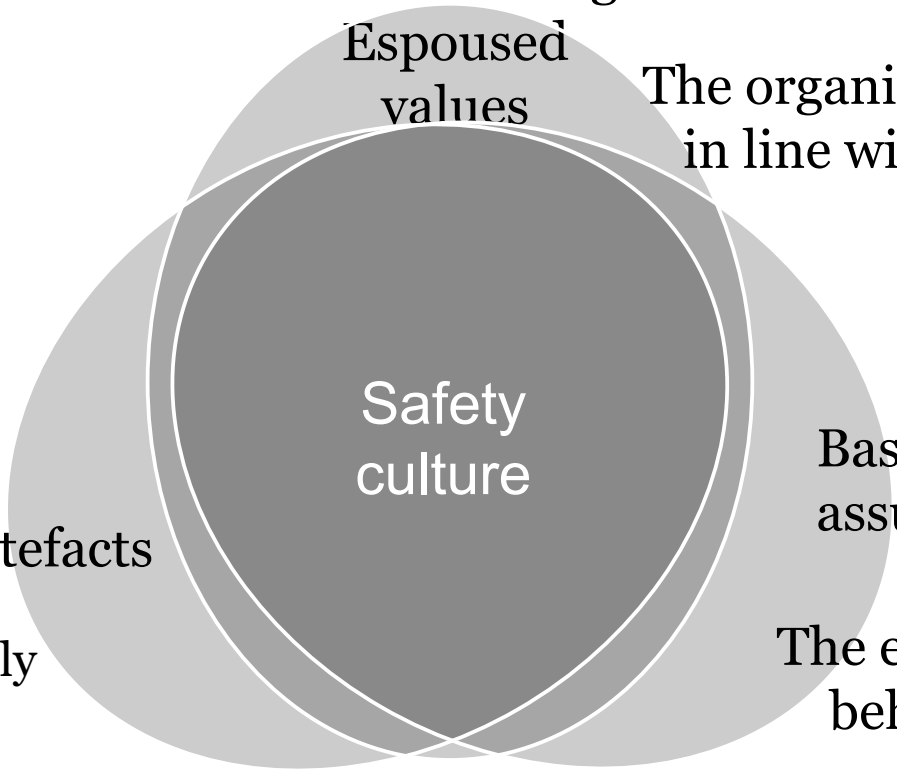
Anspruchsniveau:
a person's ambition for
performance in a task.
(Chapman & Volkman, 1939)

Anthropology: Socially
transmitted behaviour patterns
(Keesing, 1974)

Organizational culture:
artefacts and behaviours
espoused values assumptions
(Schein, 1992)

Safety culture / organisational culture

The organization's stated values and rules of behaviour. How the members represent the organisation to themselves and to others



Espoused values: The organization's stated. Should be in line with the basic assumptions.

Artefacts: Any tangible, overt or verbally identifiable elements in an organization. The visible elements of a culture that can be recognized by outsiders.

Basic assumptions: The embedded, unconscious behaviours that constitute the essence of culture. Deeply integrated and therefore hard to recognize.

But what IS "safety" actually?

Safe tysyn thesis

Part2.What is resilience and how can it be managed?

Safety culture and resilience

If organizational / Safety culture mainly is how we **do** things around here, then it corresponds to the potential to respond, which in turn makes it functionally very similar resilient performance as something a system **does** rather than something it **has**

System failure and safety management

Most of the problems in managing safety are known, and many of the solutions are already available

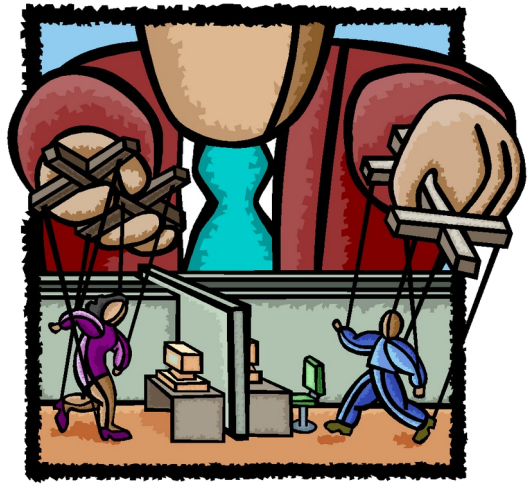
From Hudson: Safety culture and leadership (1999)

Nevertheless, organisations seem incapable of implementing what seems obvious

The level of (safety) culture determines what can be implemented

Organisational cultures understand the world corresponding to their current level and their readiness to change

Counter-pressures force organisations towards a calculative culture



Safety-I: without unwanted outcomes

Negative outcomes are caused by failures and malfunctions.

"The state in which the risk of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management."

Safety-I = Reduced number of adverse events.

Eliminate failures and malfunctions as far as possible.

Safety as "with" or as"without"?

Health is 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity'.

SAFETY

Safety-I:
Safety is the freedom from unacceptable risk

Safety is the ability to perform as required *under expected and unexpected Conditions alike.*

Reduce unacceptable outcomes (accidents, incidents, etc)

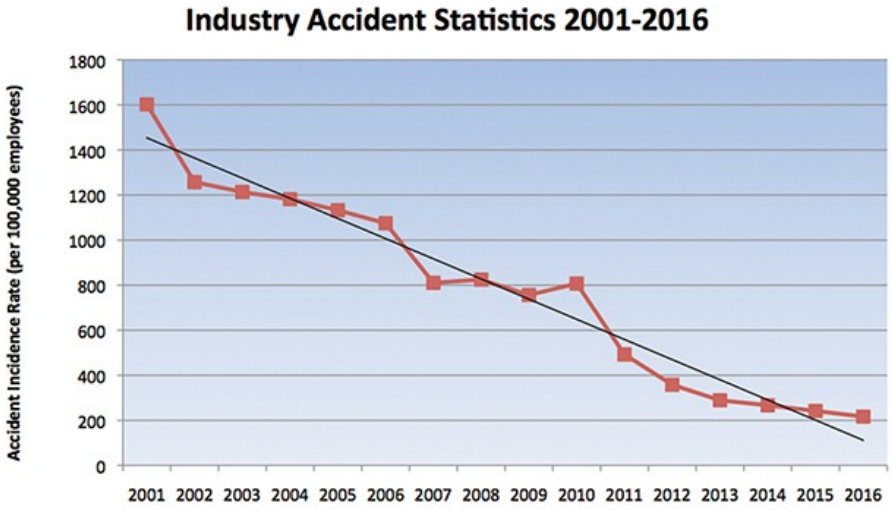
Safety-I:Safety as "**without**"

Increase acceptable outcomes (everyday work)

Safety-II: Safety as "**with**"

Safety-I – when nothing goes wrong

Safety is a condition where the number of adverse outcomes (accidents / incidents / near misses) is as low as possible.



The premise for Safety-I is the need to understand why accidents happen.

Safety-I is defined by its opposite – by the lack of safety (accidents, incidents, risks).

How can we improve safety by studying situations where there is a lack of safety?

Safety II – when all goes well

Safety-II: Safety is a condition where the number of successful outcomes (meaning everyday work) is as high as possible. It is the ability to succeed under varying conditions.

Safety is defined by its presence.

The premise for Safety-II is the need to understand everyday performance.

If the level of safety increases, the proxy measure should also increase.

Safety can only be improved by studying situations where it is present!

Safety-II is achieved by trying to make sure that things go well, rather than by preventing them from going wrong.

Three types of causes

Factual cause

It **was** there.

If this had NOT happened!

Technical failure
Natural disturbance
External disruption

Then all would have been well.

Counterfactual causes

We **think** it was there

If this had NOT happened!

"Human error"
Organisational blindness

Then all would have been well.

Counterfactual causes

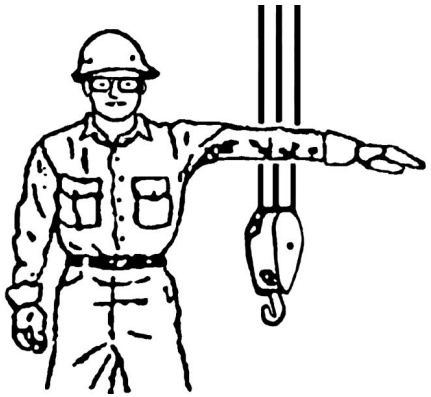
It **should** be there

If only we can have MORE of this

Safety culture
Situation awareness
Resilience

Then all will be well.

Increasing safety by reducing failures



Function (work as imagined) → Success (no adverse events) → Acceptable outcomes

"Identification and measurement of adverse events is central to safety."

~~Malfunction, non-compliance, error~~

"Find, fix – and forget"

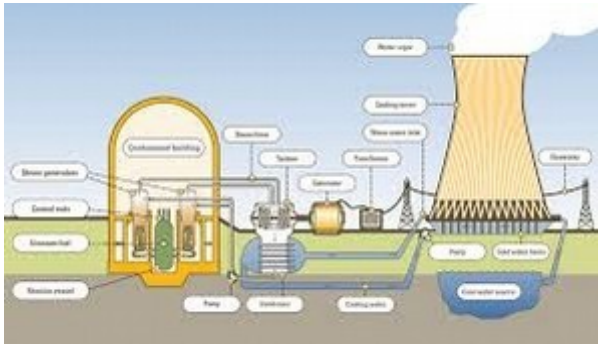
Unacceptable outcomes

Problems and solutions should match

Trivial problems

may possibly (?) have

Trivial solutions



Non-trivial problems

always require

Non-trivial solutions

Disguising Non-trivial problems as trivial problems by offering trivial solutions does not make the problems more trivial. it only means the solution is unlikely to work as planned

How to think of safety culture

We might see culture for an organisation as analogous to personality in the individual.

Suppression—Harming or stopping the person bringing the anomaly to light; "shooting the messenger"

Encapsulation—Isolating the messenger, so that the message is not heard

Public relations—Putting the message "in context" to minimise its impact

Local fix—Responding to the presenting case, but ignoring the possibility of others elsewhere

Global fix—An attempt to respond to the problem wherever it exists. Common in aviation, when a single problem will direct attention to similar ones elsewhere

Westrum, R. (2004). A typology of organisational cultures. *Qual Saf Health Care*, *13*

Why does work usually go well?

Availability of resources (time, manpower, materials, information, etc.) may be limited and uncertain.

People adjust what they do to match the situation.

Performance variability is inevitable, ubiquitous, and necessary.

Because of resource limitations, performance adjustments will always be approximate.

Performance adjustments are why things usually go well.

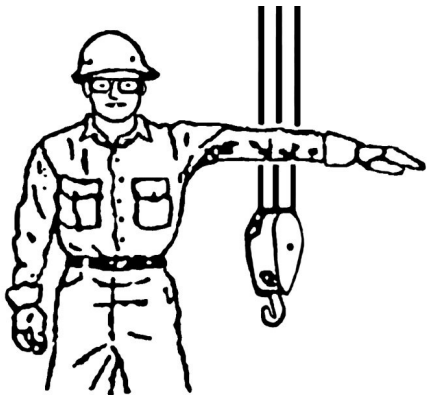
Same process - Different outcomes

Performance adjustments are why things sometimes go wrong.

Same process ➡ different outcomes

Safety Synthesis

Understanding the variability of everyday performance is the basis for safety.



Function (Work-as-Imagined)

Everyday work (Work-as-Done)

Malfunction, non-compliance, error

Success (no adverse events)

Acceptable outcomes

Failure (accidents, incidents)

Unacceptable outcomes

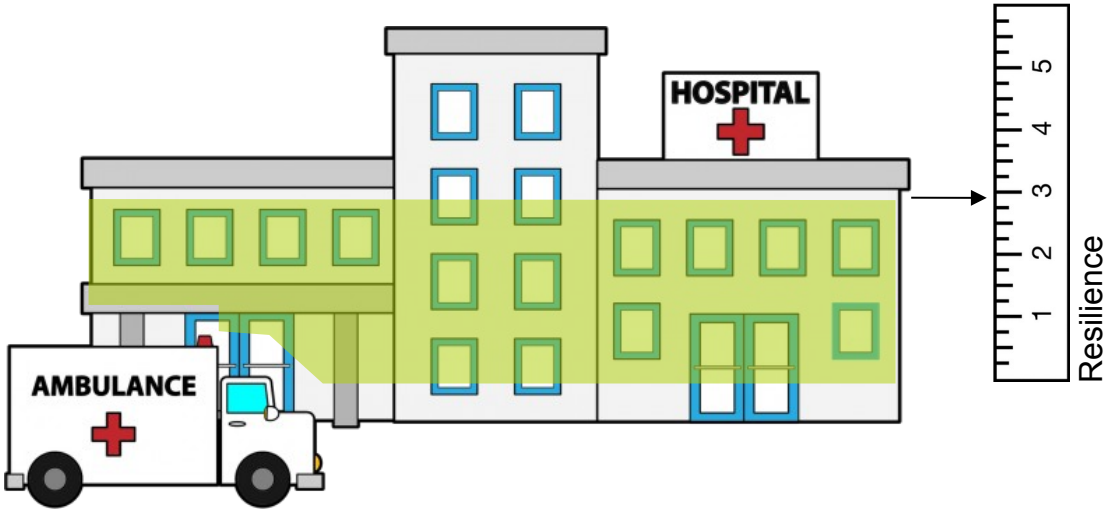
Constraining performance variability to remove failures will also remove successful everyday work.

Resilience is not a trivial property

Safe tysyn thesis

Resilience is not a trivial property of a system. It is not something that a system **has**.

It is therefore not meaningful to refer to the level – or degree - of resilience.



Resilience is a quality or a characteristic of how a system performs.

It is something that a system **does**.

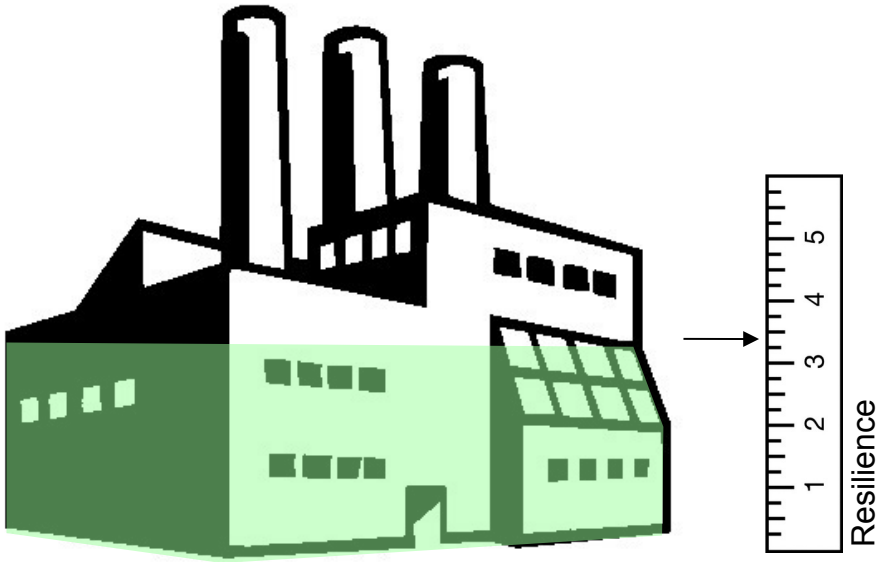
But resilience is NOT a simple solution or something that can be measured and managed on its own.

Looking at the big picture

Resilience is not a quality but a characteristic of how an organisation or a system, and the people in it, performs in general – not just with regard to safety. It refers to how well an organisation performs.

Resilience is not a property of an organisation or a system, hence not something that an organisation or a system **has**. But It is something that a system **does**

We cannot increase an organisation's resilience, but we can improve the potentials for resilient performance.

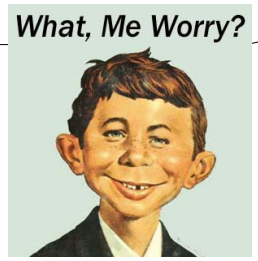


Enumerator denominator problem!

Safety Synthesis

Number of of unacceptable events

number of events overall (unknown)



$$\frac{U}{E}$$

U Accidents and incidents

E "Nothing" happened dynamic non-events

$$A = E - U$$

Number of events that have gone well. Should be the focus of learning! But are usually ignored

Safe tysynthesis

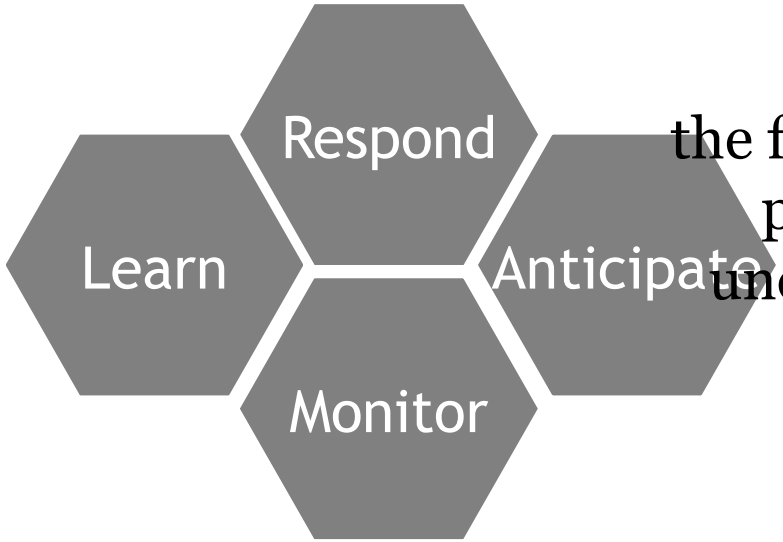
Part 2. What is Resilient performance, and how can it be managed?

What is Resilient performance?

A system or an organisation should be able to function as required under both expected and unexpected conditions (changes / disturbances / opportunities).

People, individually and collectively, cope with everyday situations - large or small – by adjusting their performance to the conditions.

silient performance requires
at four systemic potentials
are present



the four systemic potentials provide a non-trivial understanding of system performance

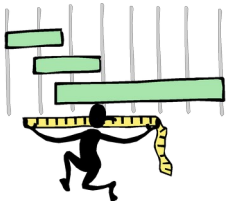
Resilient performance requires the potentials to respond, monitor, learn, and anticipate, but not in a fixed ratio.

As high as reasonably practicable

Safe tysyn thesis

Respond

For which events is there a response ready?
What is the threshold of response?
How many resources are allocated to response readiness?
…



Monitor

How have the indicators been defined?
How many indicators are leading and how many are lagging?
What is the delay between measurement and interpretation?
….

Learn

What is the learning based on (successes – failures)?
Is learning continuous or event-driven?
How are the effects of learning verified and maintained?

Anticipate

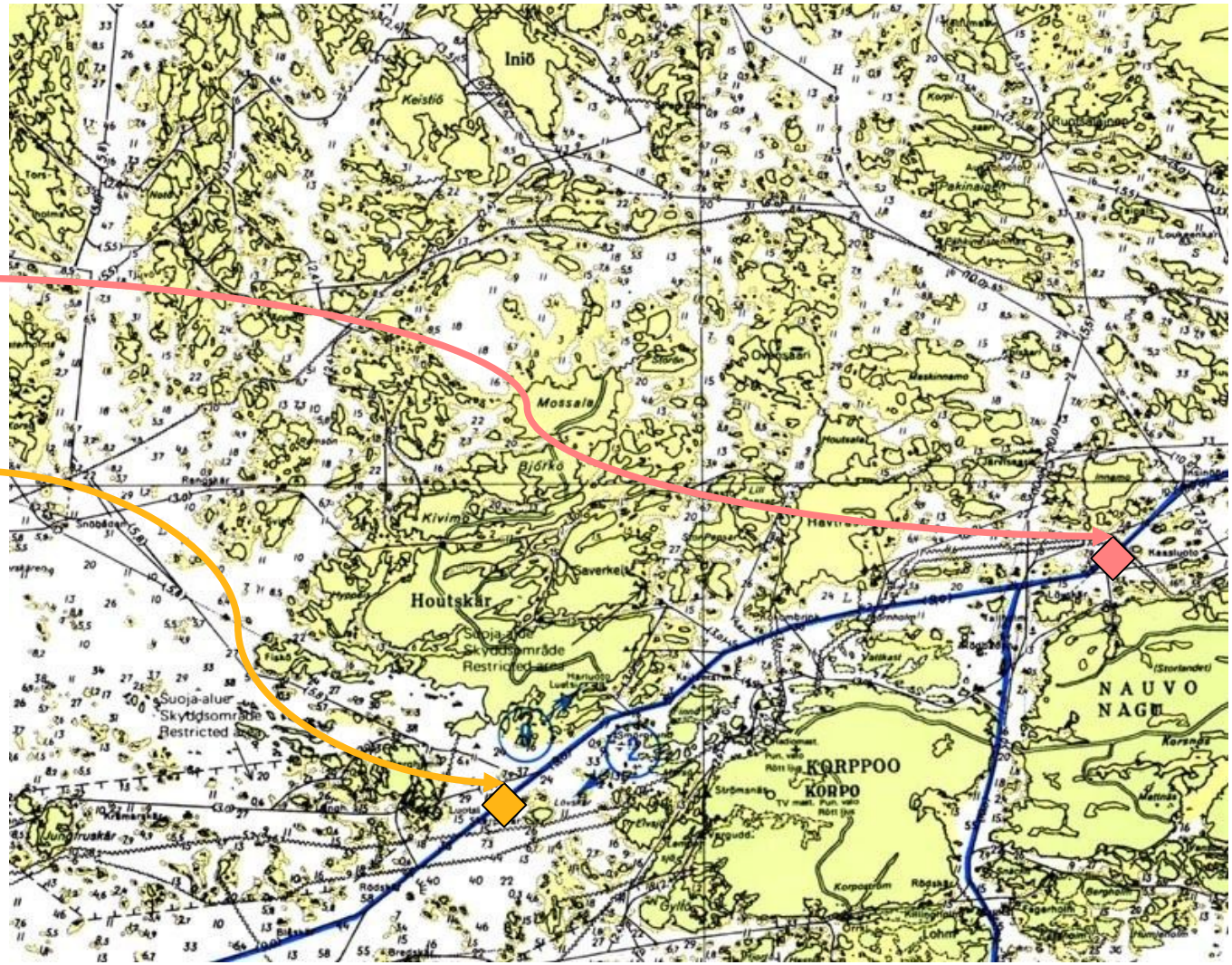
What is the implicit/explicit "model" of the future?
How far does the organisation look ahead ("horizon")?
What risks are the organisation willing to take?
…

Management is like traveling

GOALS or TARGETS:
Where do we want to go? When should we arrive?

POSITION:
Where are we now?
How well are we doing?

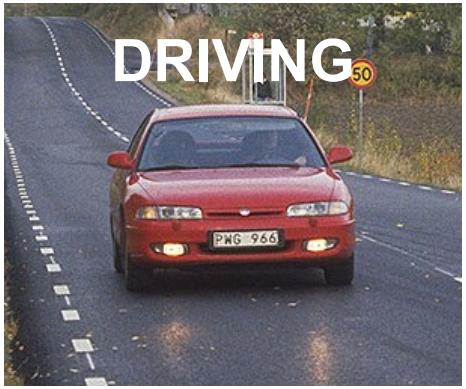
MEANS or PROCESS:
How can we change position ("speed" and "direction")?



Wrong management style

I don't know where we are or where we are going, but we are making good progress

Managing different processes



Goal: Well defined
Position: Known
Means / Process:
Well known, transparent

Goal: Well defined
Position: Known
Means / Process:
Well known, transparent

Goal: well defined
Position: Known
Means / Process:
Well known, transparent

Managing safety

Goal: Defined by negation (no accidents)

Position: Vaguely known or unknown

Means / Process: Partly unknown, based on tradition rather than knowledge.

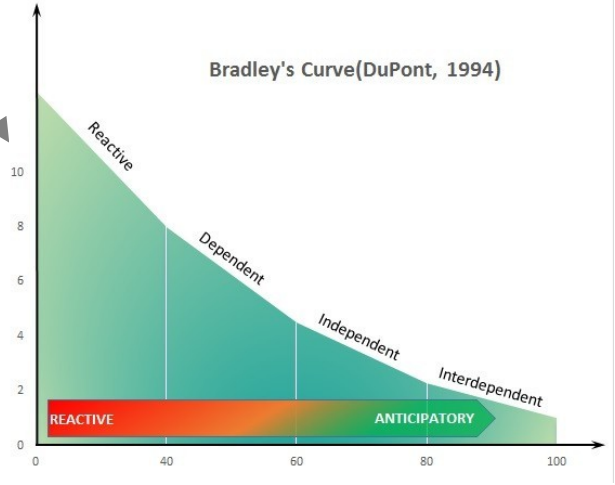
Safety: What is the goal?

Global Aviation Safety Roadmap

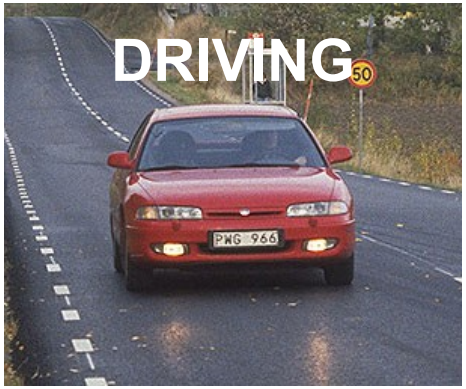
Goals and Objectives:

- Provide a common frame of reference for all stakeholders
- Coordinate and guide safety policies and initiatives worldwide to reduce the accident risk
- Avoid duplication of effort and uncoordinated strategies
- Encourage close industry and government cooperation on common safety objectives

Safety goals are rarely described explicitly

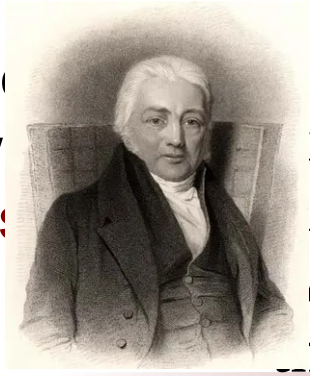


Maps -- what is in the future?



Goal: Well defin
Position: Know
Means / Proces
Well known, transparent

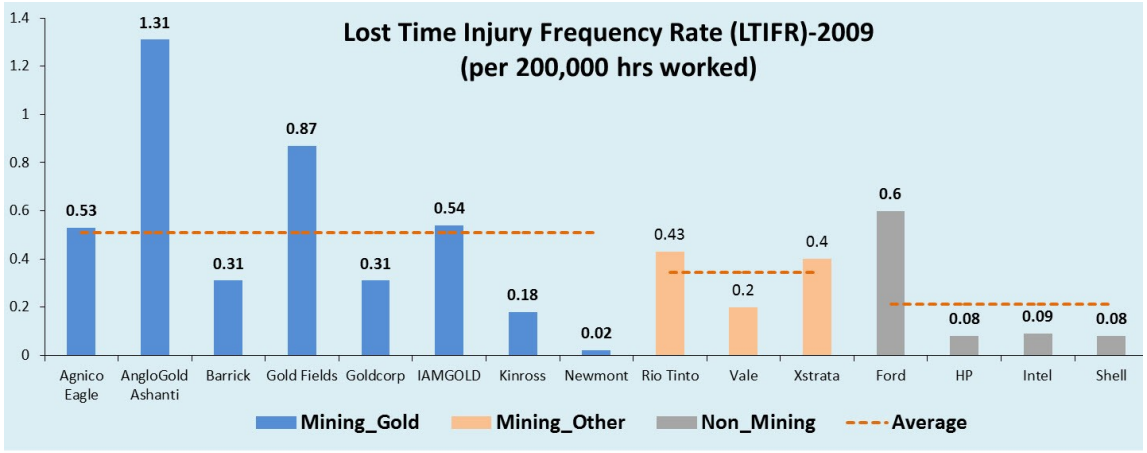
Safety: no map, no terrain, markers are KPI of the past that go towards zero, hence disappear

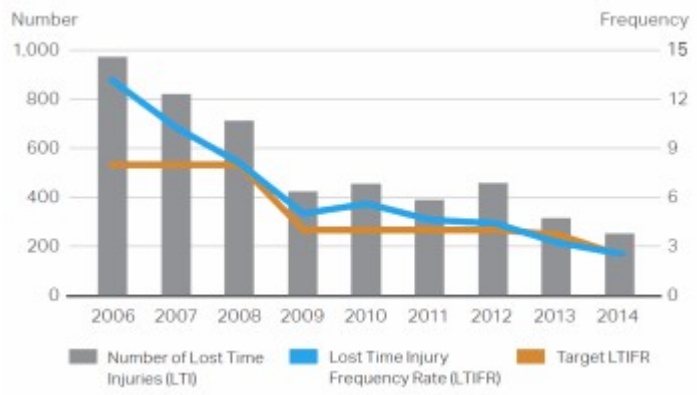


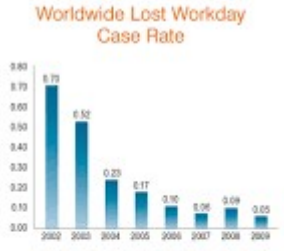
Coleridge quote:
"the light which
perience gives us is a
antern on the stern
hich shines only on
ne waves behind us".

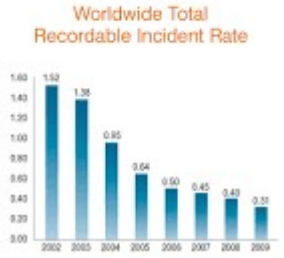
Goal: well defined
Position: Known
Means / Process:
Well known, transparent

Safety: What is the position?

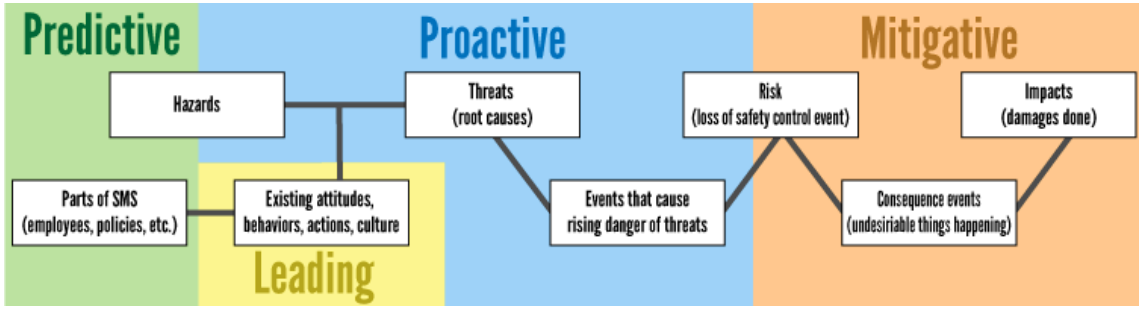




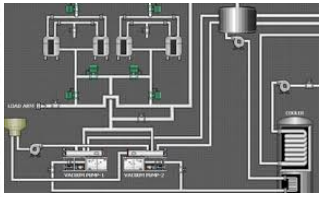




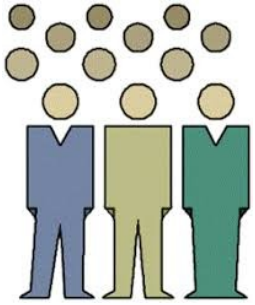
Most, if not all, safety measures refer to negative outcomes (accidents, etc.)



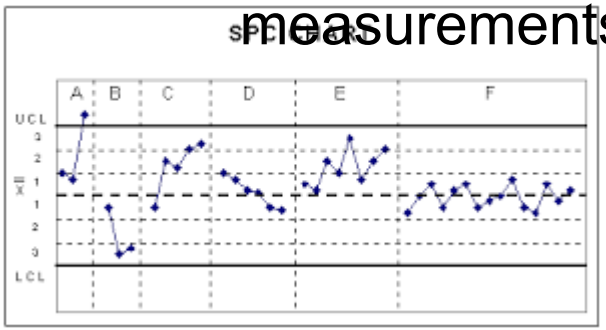
How do we know where we are?



Technological systems are designed and built. We know what the “components” are, how they should work and can therefore define meaningful measurements.



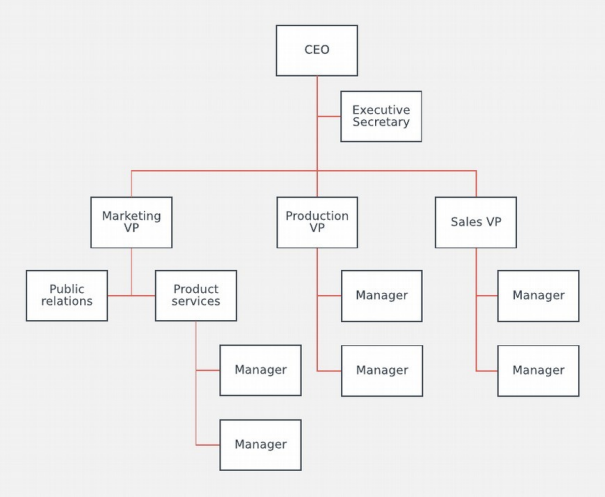
Organisations “grow” but are not built. We know little of how they actually work and it is therefore difficult to define meaningful measurements.



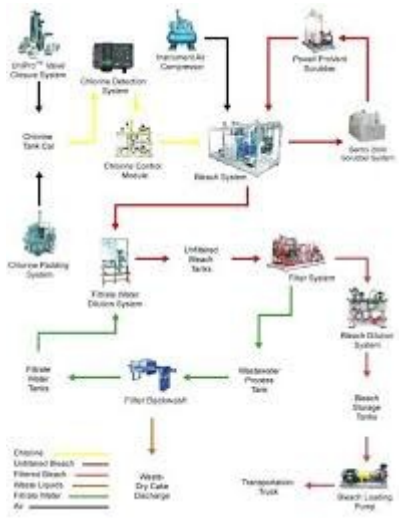
$$\mathrm{CPI} = \frac{\sum_{i=1}^{n} \mathrm{CPI}_i \times \mathrm{weight}_i}{\sum_{i=1}^{n} \mathrm{weight}_i}$$

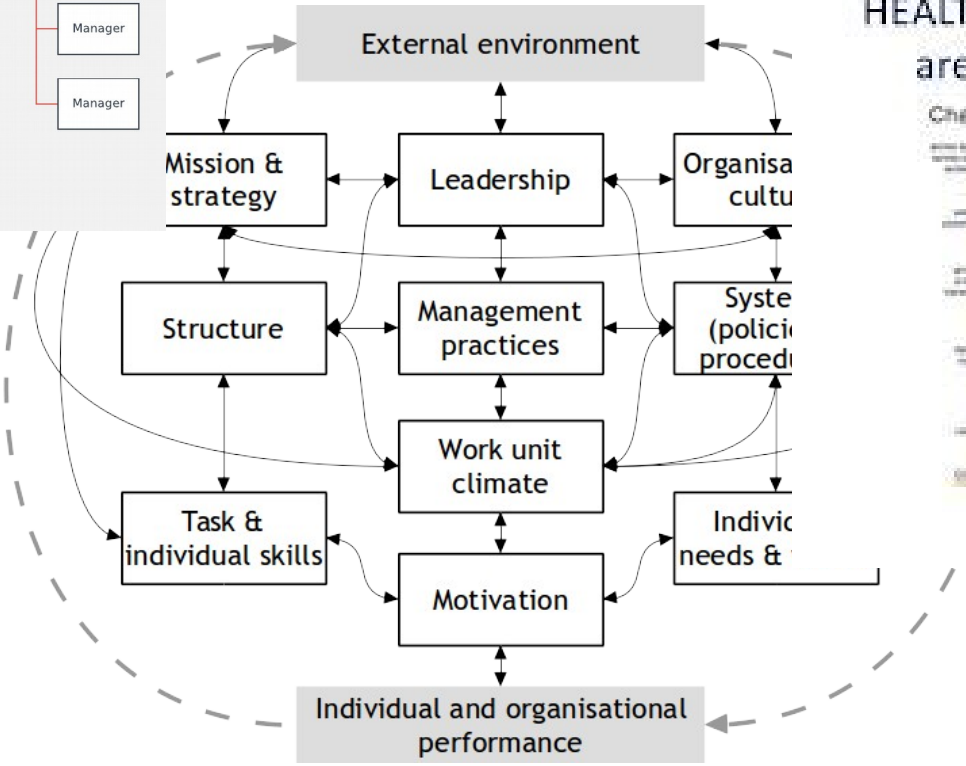
Consumer Price Index

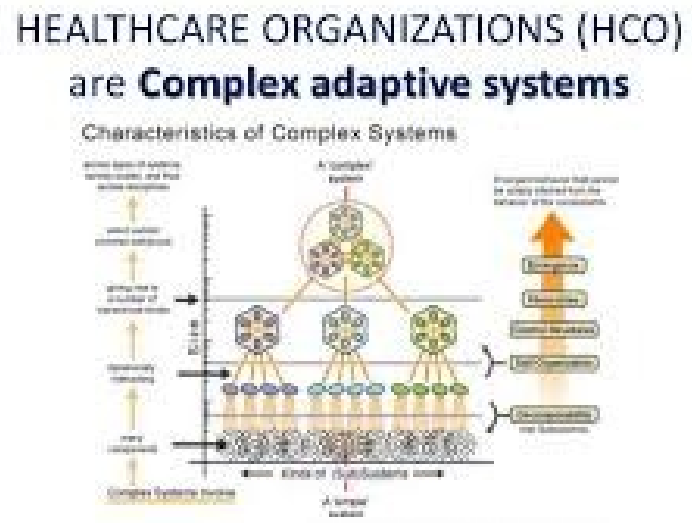
Means: How does an organisation function?

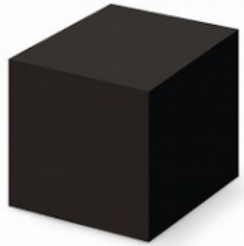


In order to manage something it is necessary to know how it functions!







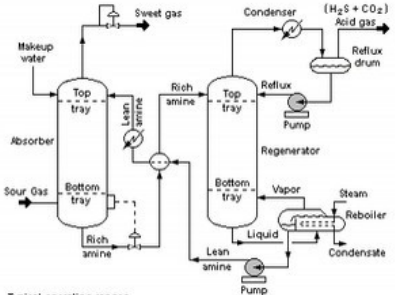


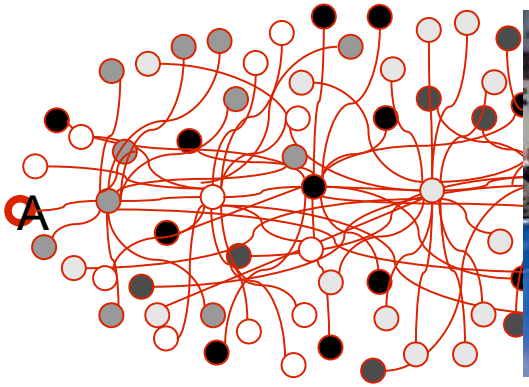
Ways of understanding systems

Simple system
(technical)

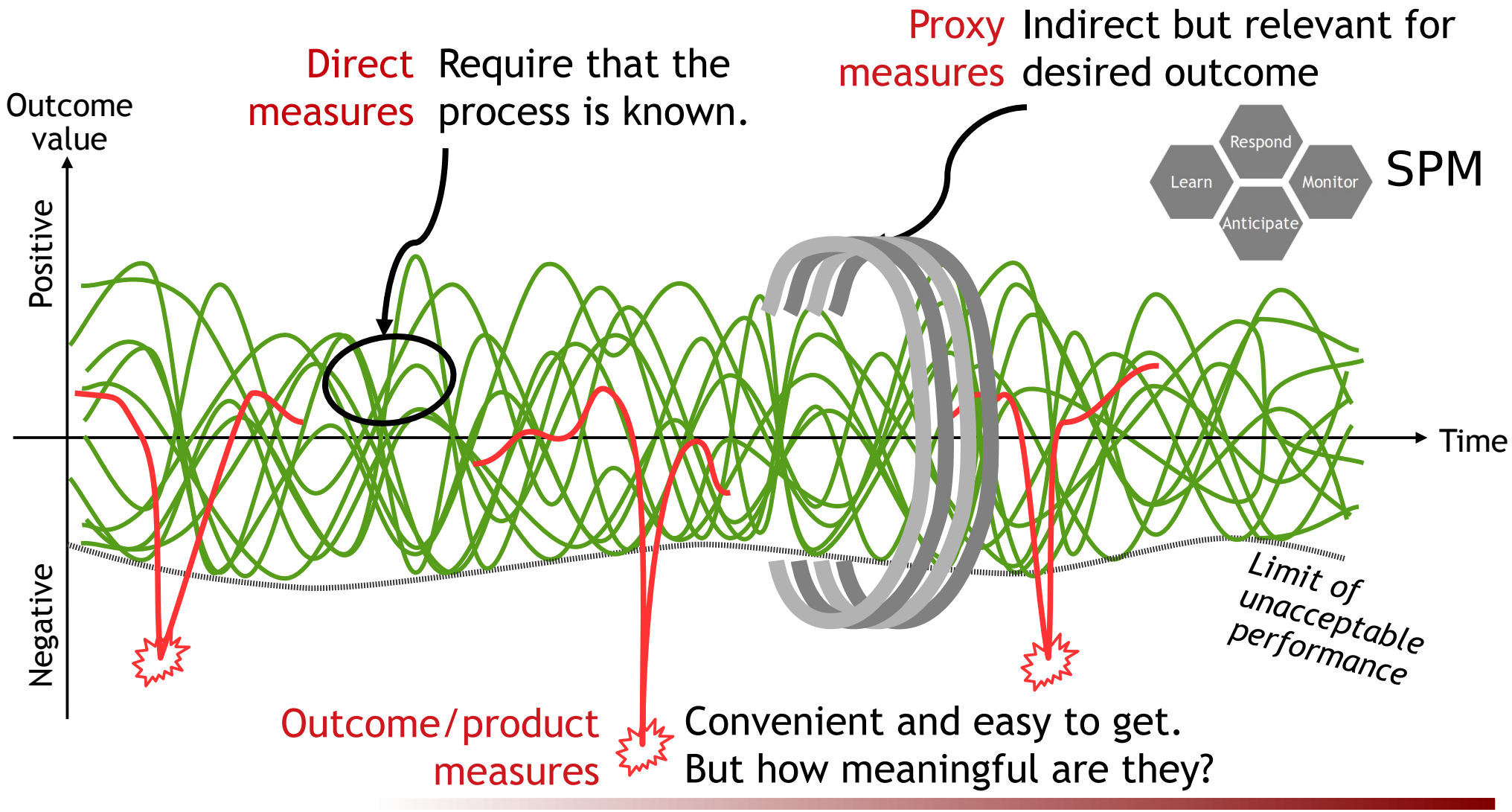
Complicated system
(socio-technical)

Complex system
(intractable)

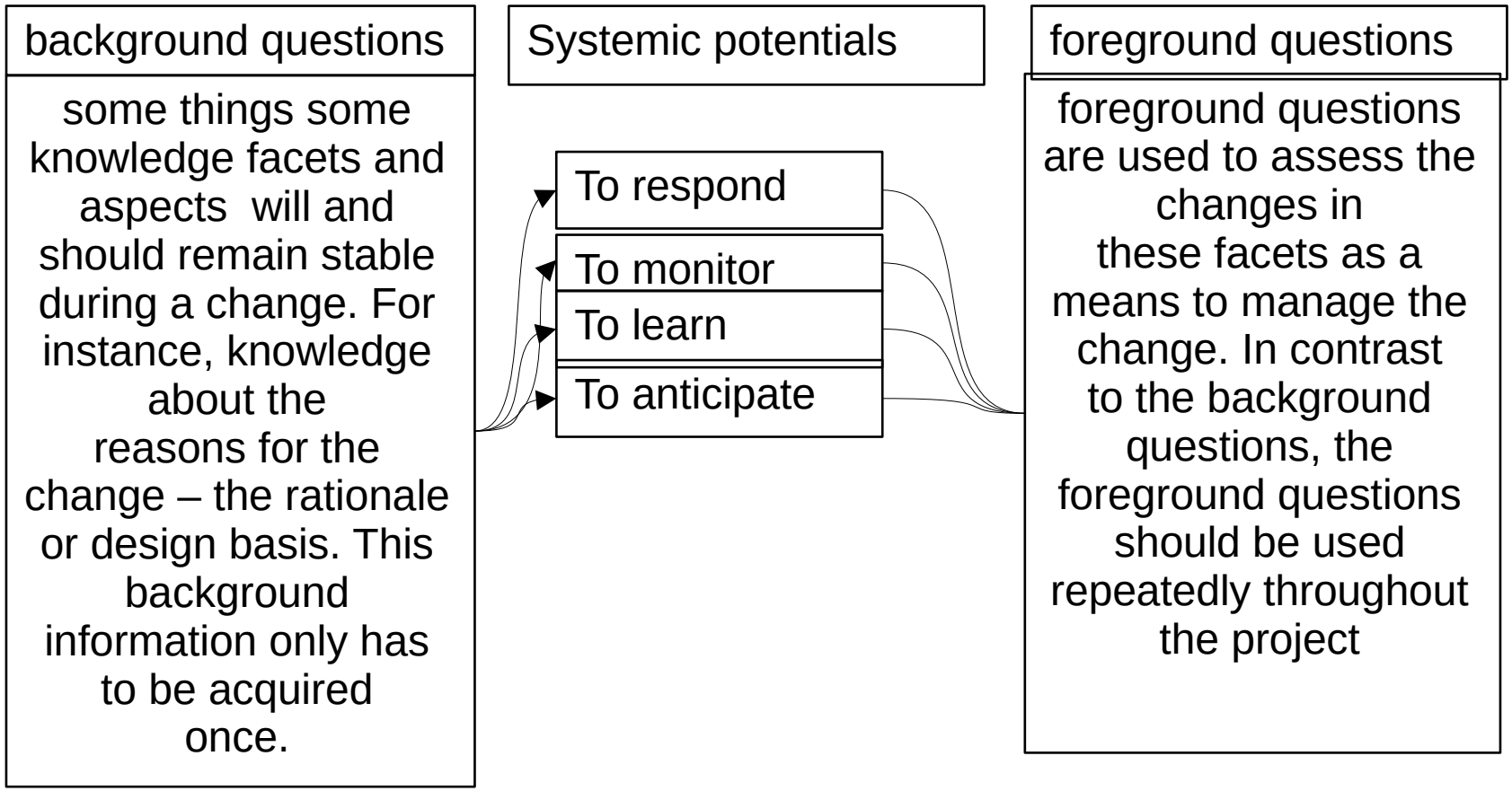




Management requires measurements



Gauging the systemic potentials



The Systemic Potentials questions

		Target*	Status
Event list	Is there a prepared list of possible and potential events or conditions for which the system should be ready to respond?		
Relevance of event list	Has the list been verified and/or is it revised on a regular basis?		
Response set	Have responses been planned and prepared for every event in the list? Do people know what to do when one of these events occur?		
Relevance of response set	Does the system check that the responses are adequate? How, and how often, is this done?		
Response start and stop	Are the triggering criteria or threshold well defined? Are there clear criteria for when to return to a "normal" state?		
Activation & duration	Can an effective response be activated fast enough? Can it be sustained as long as needed?		
Response capability	Are there sufficient support and resources to ensure response readiness (people, equipment, materials)?		
Verification	Is the readiness to respond (response capability) adequately maintained? Is the readiness to respond verified regularly?		

		Target	Status
Indicator list	Does the organisation have a list of regularly used performance indicators?		
Relevance	Is the list verified and/or revised on a regular basis?		
Validity	Has the validity of indicators been established?		
Delay	Is the delay in sampling indicators acceptable?		
Sensitivity	Are the indicators sufficiently sensitive? Can they detect changes and developments early enough?		
Frequency	Are the indicators measured or sampled with sufficient frequency? (Continuously, regularly, every now and then?)		
Interpretability	Are the indicators / measurements directly meaningful or do they require some kind of analysis?		
Organisational support	Is there a regular inspection scheme or schedule? Is it properly resourced? Are the results communicated and put to use?		

		Target	Status
Selection criteria	Does the organisation have a clear plan for which events to learn from (frequency, severity, value, etc.)?		
Learning basis	Does the organisation try to learn from things that go well or does it only learn from failures?		
Learning style	Is learning event driven (reactive) or continuous (scheduled)?		
Categorisation	Are there any formal procedures for data collection, classification, and analysis?		
Responsibility	Is it clear who is responsible for learning? (Is it a common responsibility or assigned to specialists?)		
Delay	Does learning function smoothly or are there significant delays in the learning process?		
Resources	Does the organisation provide adequate support for effective learning?		
Implementation	How are 'lessons learned' implemented? (Regulations, procedures, training, instructions, redesign, reorganisation, etc.)		

		Target	Status
Corporate culture	Does the corporate culture encourage thinking about the future?		
Acceptability of uncertainty	Is there a policy for when risks / opportunities are considered acceptable or unacceptable?		
Time horizon	Is the time horizon of the organisation appropriate for the kind of activity it does?		
Frequency	How often are future threat and opportunities assessed?		
Model	Does the organisation have a recognisable and articulated model of the future?		
Strategy	Does the organisation have a clear strategic vision? Is it shared'?		
Expertise	What kind of expertise is used to look into the future? (In-house, outsourced?)		
Communication	Are the expectations about the future known throughout the organisation?		

Comprises four sets of questions, one for each potential. The questions are:

SPECIFIC – address issues that are important for a concrete organisation.

DIAGNOSTIC – point to details of a potential that are meaningful to assess.

FORMATIVE – answers can be used to make decisions about how to improve potentials.

Generic background questions

Safe tysyn thesis

Background questions for the potential to **learn** should look at the role and importance of learning in the organisation, how learning is resourced and managed, the balance between reporting and learning, how "lessons learned" should be used and maintained – by the organisation, and so on.

Background questions for the potential to **respond** should be directed at facets such as the justification for the list of events that needed a response, and for the list of response, their relevance, the threshold for responses, and the verification of responses.

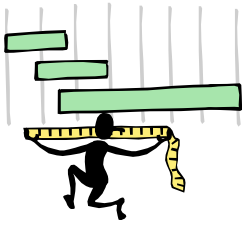
Background questions for the potential to **monitor** should be directed at facets such as how the indicators and measurements have been selected, and how their relevance is established.

.Background questions for the potential to **anticipate** should examine the purpose and potential value of anticipation, how it fits into a long term strategy or vision, whether it is an internal or outsourced function, and how it aligns with the organisational culture and values.

Quality of the questions?

Respond

For which events is there a response ready?
What is the threshold of response?
How many resources are allocated to response readiness?
…



Monitor

How have the indicators been defined?
How many indicators are leading and how many are lagging?
What is the delay between measurement and interpretation?
….

Learn

What is the learning based on (successes – failures)?
Is learning continuous or event-driven?
How are the effects of learning verified and maintained?
…

Anticipate

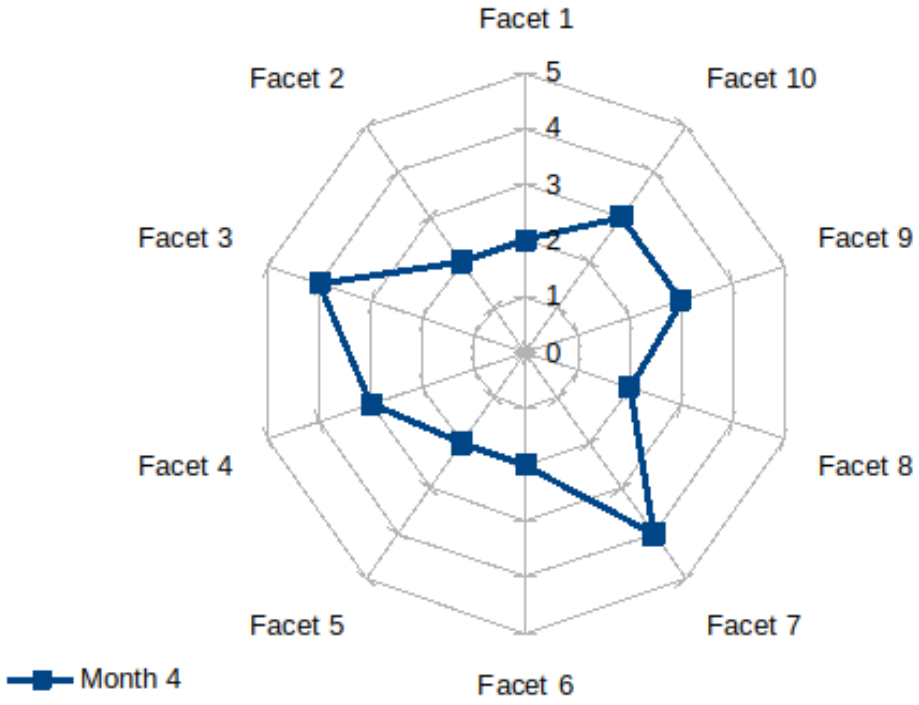
What is the implicit/explicit "model" of the future?
How far does the organisation look ahead ("horizon")?
What risks are the organisation willing to take?
…

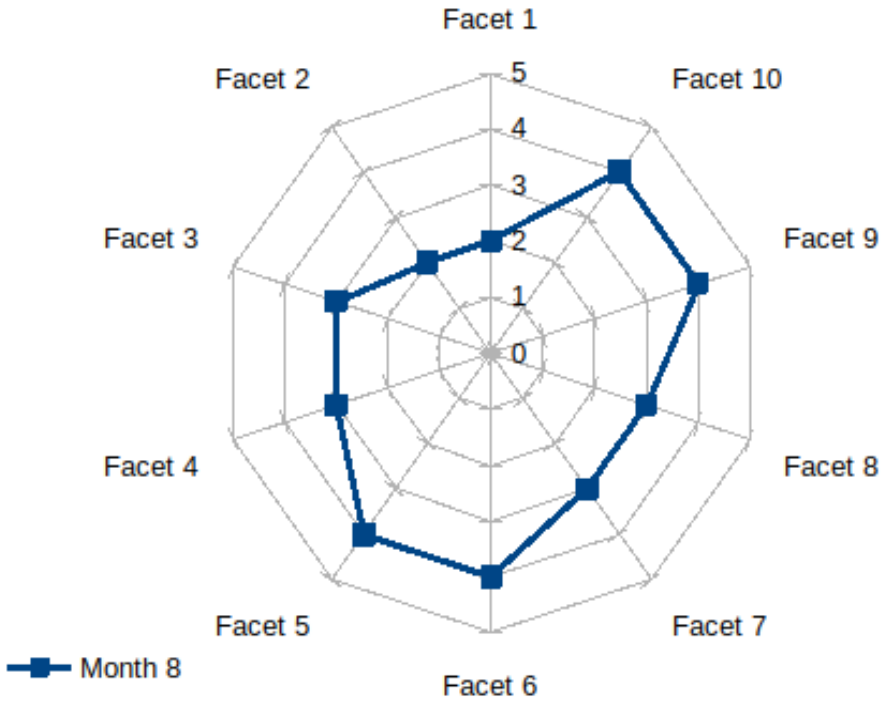
Is the question relevant for what you are trying to manage?

Is the question meaningful for the people who have to answer it?

Are the answers helpful when deciding what to do?

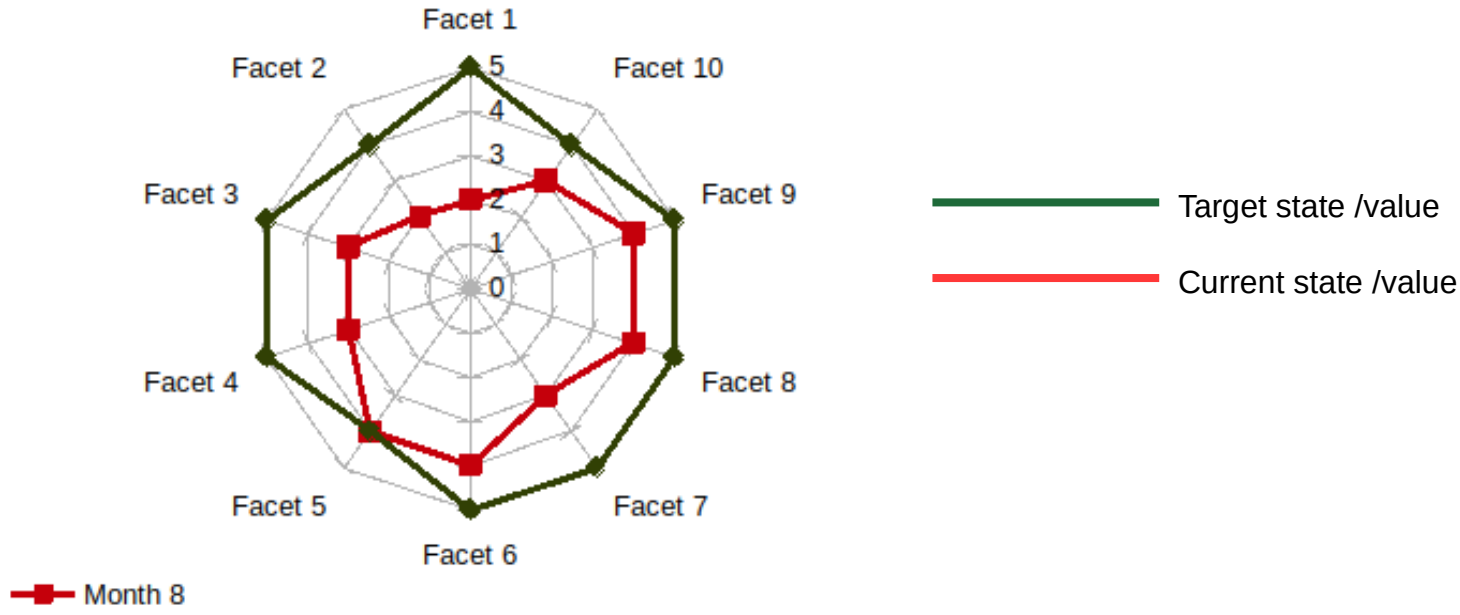
SPM profile (respond, illustration)





Each question is shown as a facet.
They should **not** be combined into a single score (number), because their relative weights are unknown!

Using the radar chart to define goals or targets



The goal (intended or desired) values of each facets can be defined and serve as a reference profile while the change takes place

Ability to learn

Q #2: The company's internal communication provide valuable information about safety.

Q #5: Company management has clear criteria to determine whether new projects have succeeded.

Q #21: I regularly study internal safety communication for things I can use in my work.

Q #31: Upper management safety initiatives are largely irrelevant to my work.

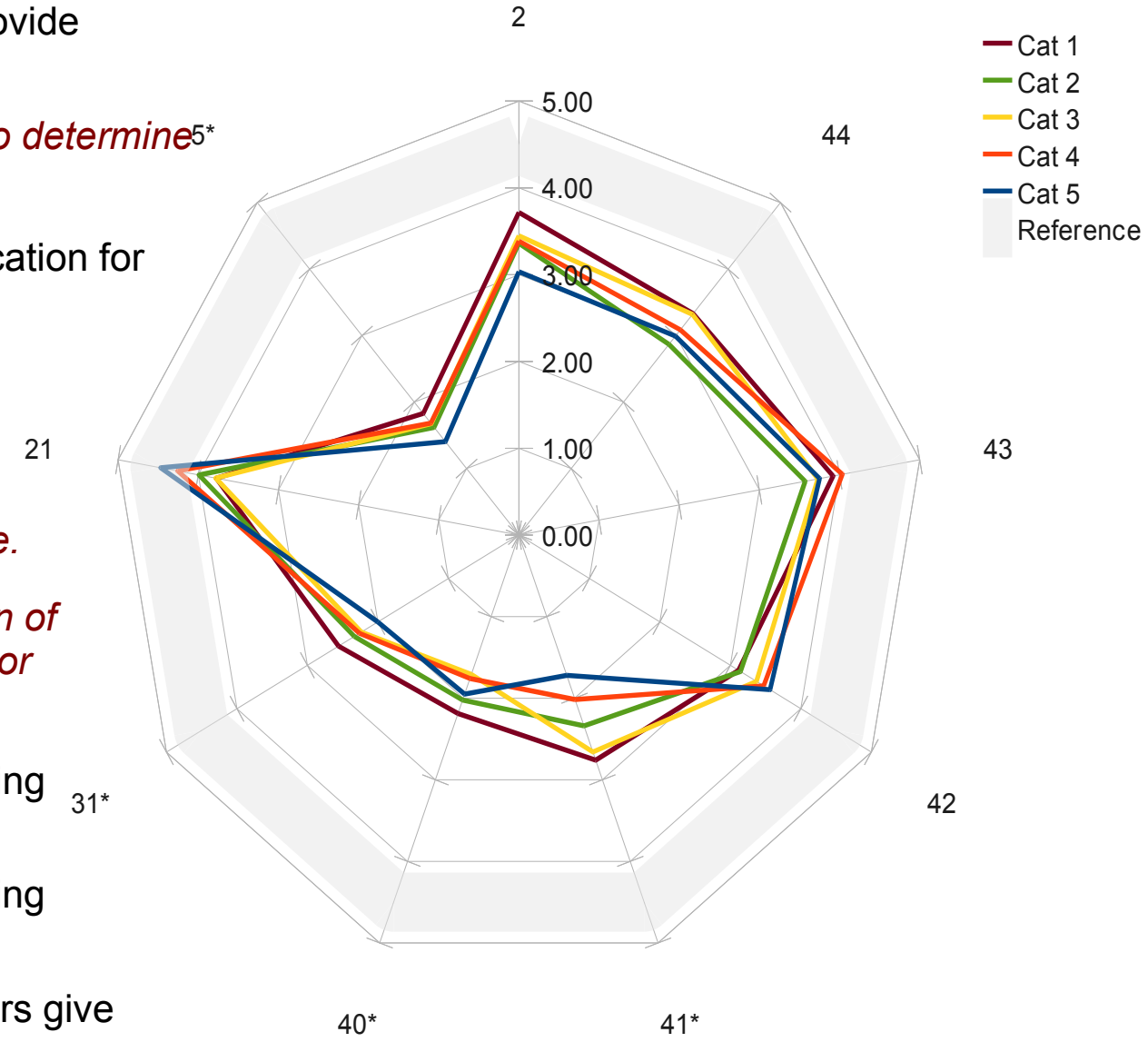
Q #40: When a problem has occurred, management usually looks for someone to blame.

Q #41: When I bring safety issues to the attention of management, their usual reaction is to minimize or deny the problem.

Q #42: The situations I practice in recurrent training address the latest (safety) issues.

Q #43: The situations I practice in recurrent training improve my skills and expertise.

Q #44: When I report an incident, safety managers give me feedback on the results of their investigation.



Ability to anticipate

Q #1: The company carefully considers possible unintended consequences of organizational changes.

Q #10: The company looks ahead and usually anticipates safety issues before incidents occur.

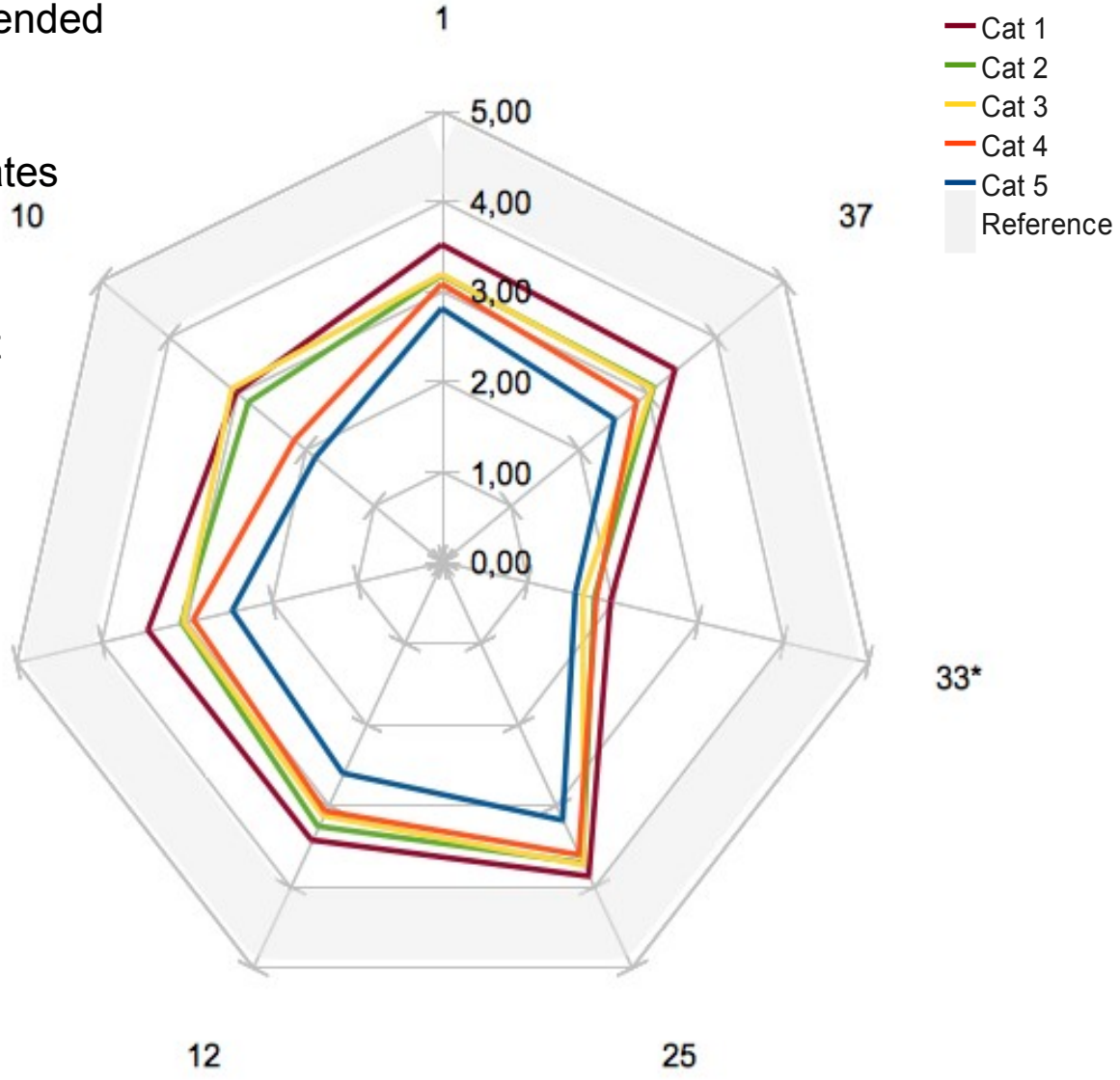
Q #11: Changes introduced by company management are based on a clear long-term vision on safety.

Q #12: Changes to procedures and policies are clearly thought through.

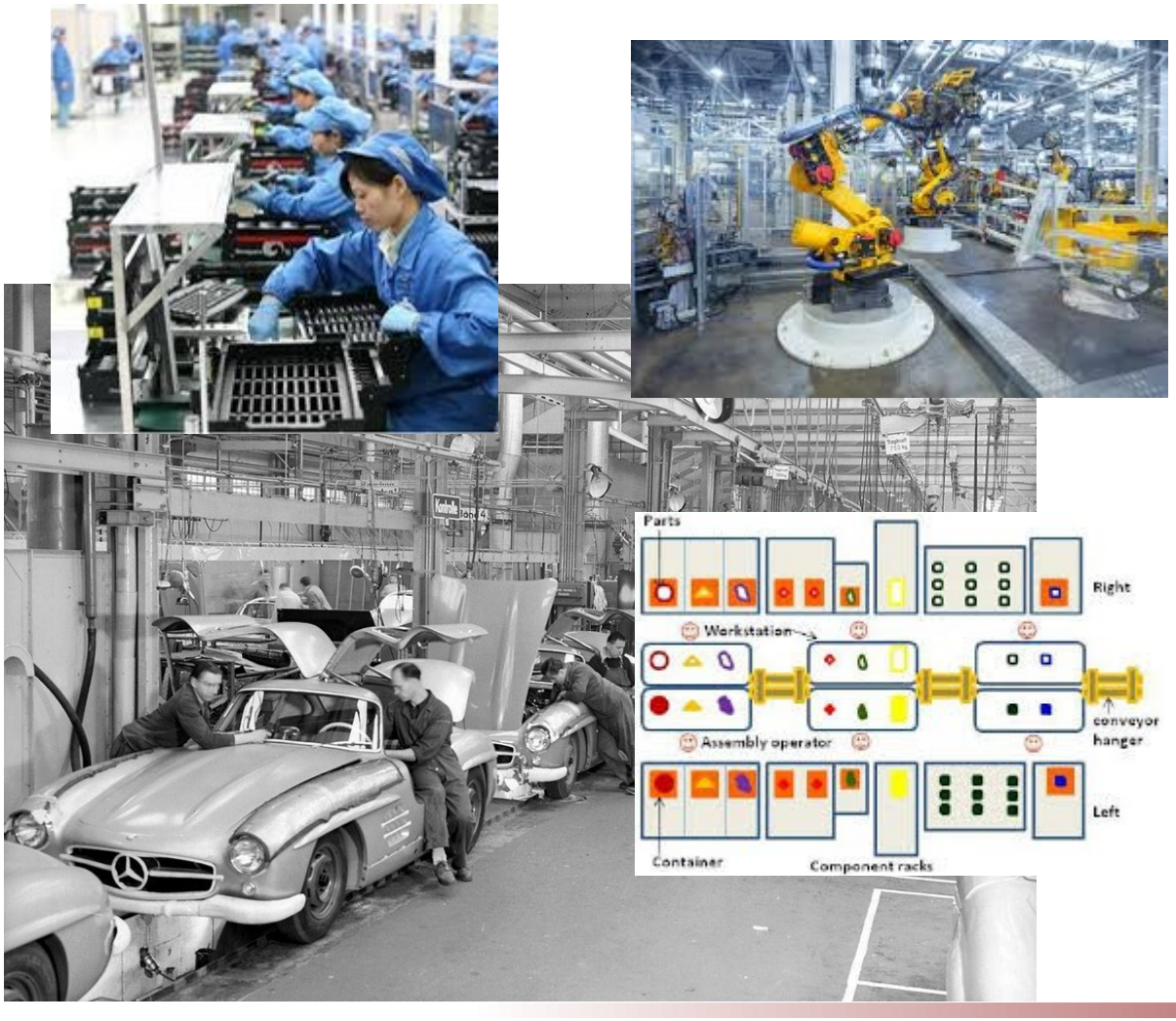
Q #25: It is an integral part of the company's safety strategy to look out for what the future may bring.

Q #33: The primary focus on changes introduced by the company is to resolve short-term problems.

Q #37: Upper management develops and communicates a clear strategic vision on safety.



Trivial systems



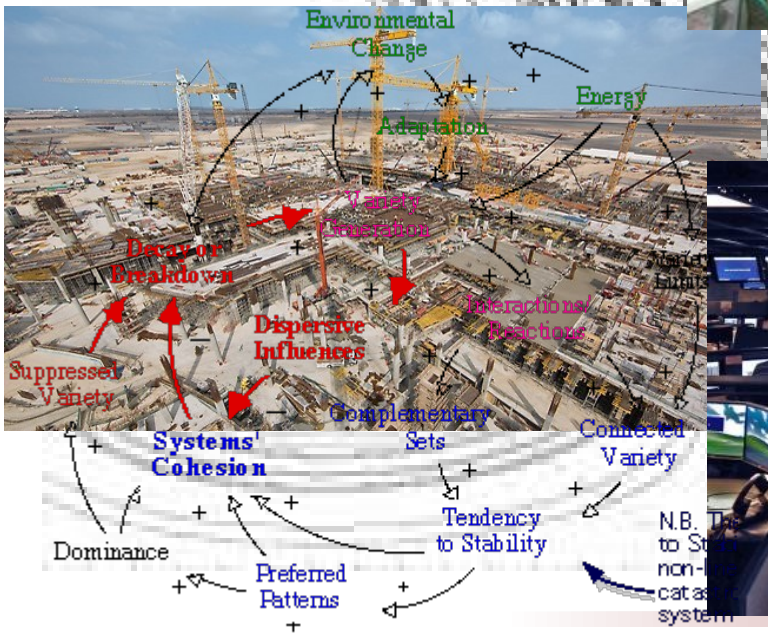
Simple descriptions with few details (technology, people)

Principles of functioning are known

System does not change while being described

Problems can have simple solutions

Non-trivial systems



Elaborate descriptions with many details

Principles of functioning are partly unknown

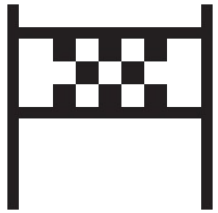
System changes before description can be completed

Problems never have trivial solutions!

Goals, position and means

Legacy
Industry practice
Current trends

Indirect, lagging
"measures"



Tradition
Standards
Requirements

Control inputs
(management
interventions)

Outcomes
(products)

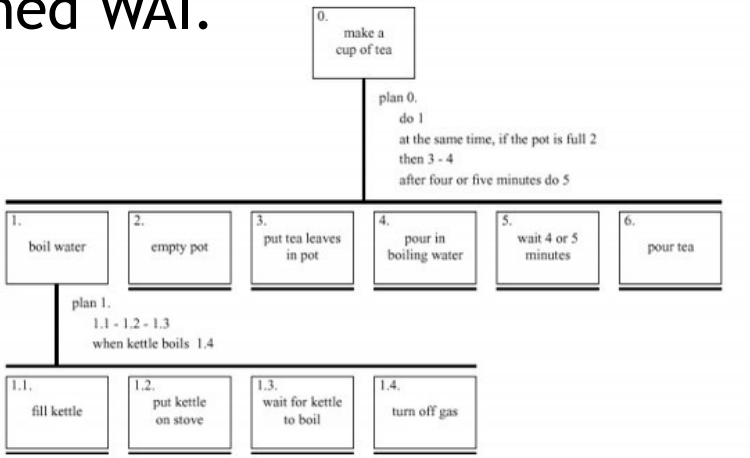
Change management
Safety culture
QA / QM - Lean

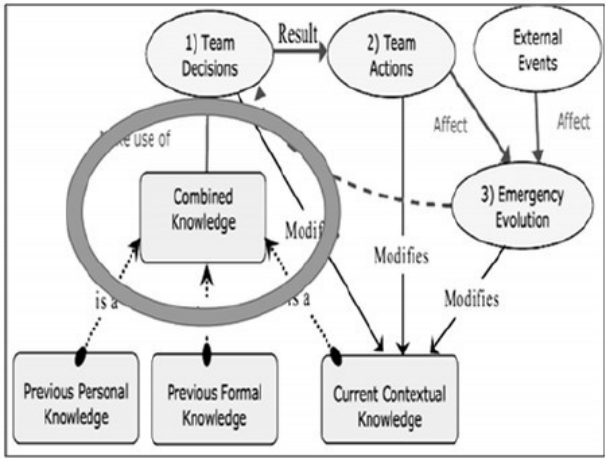
Work-as-Done,
everyday practices.
(mostly unknown)

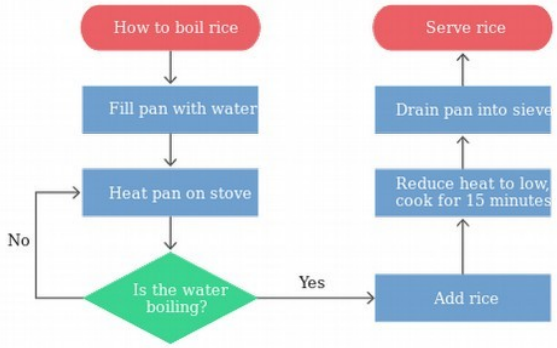
Accidents, losses
Performance indicators
Balanced Scorecards

WAI and WAD

There are many tools/methods to describe Work-as-Imagined WAI.

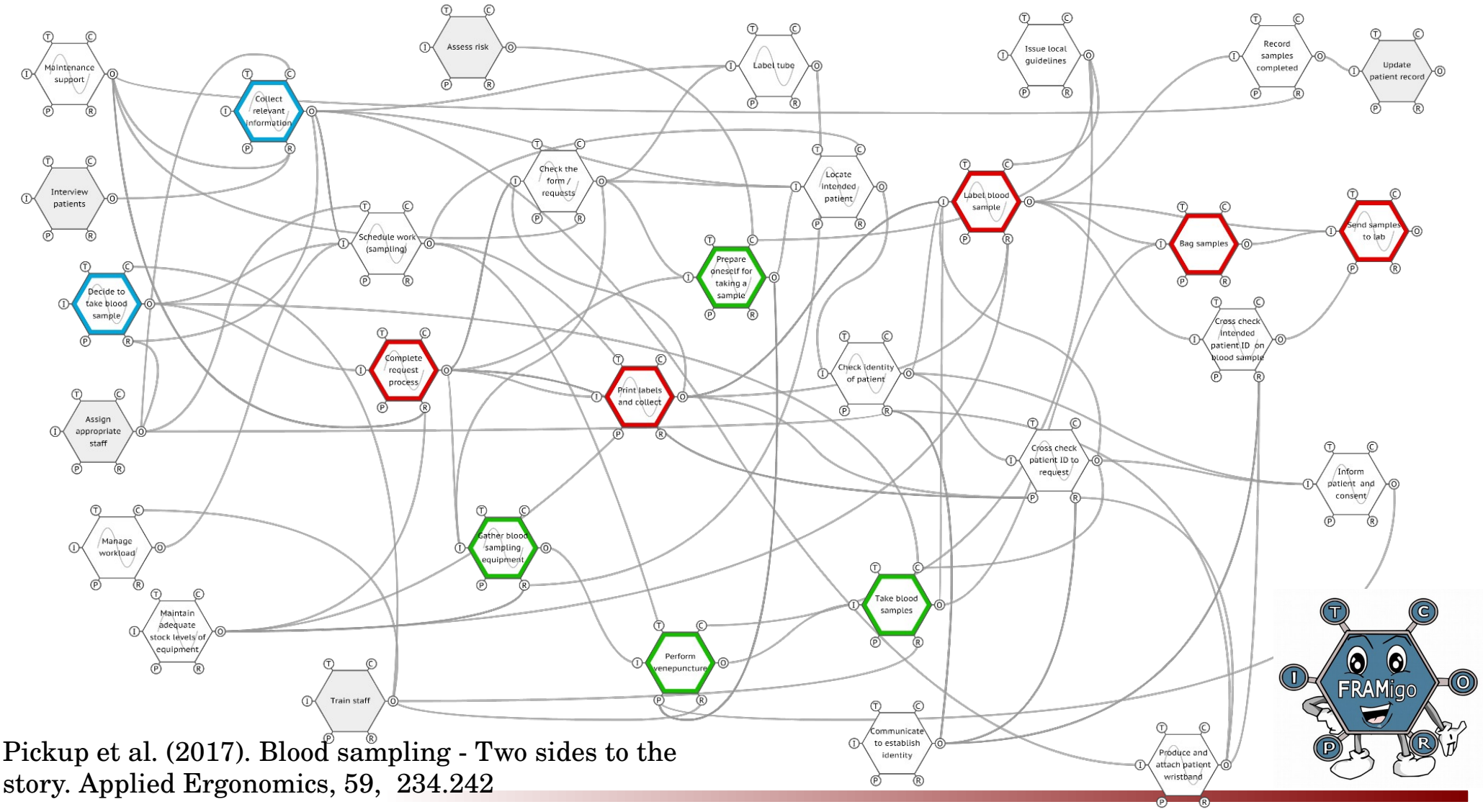






1 REQUEST
2 SAMPLE
3 SAMPLE RECEIPT
4 TESTING
5 COMPONENT SELECTION
6 LABELLING
7 COLLECTION
8 PRESCRIPTION
9 ADMINISTRATION

… but only few to describe Work-as-Done WAD

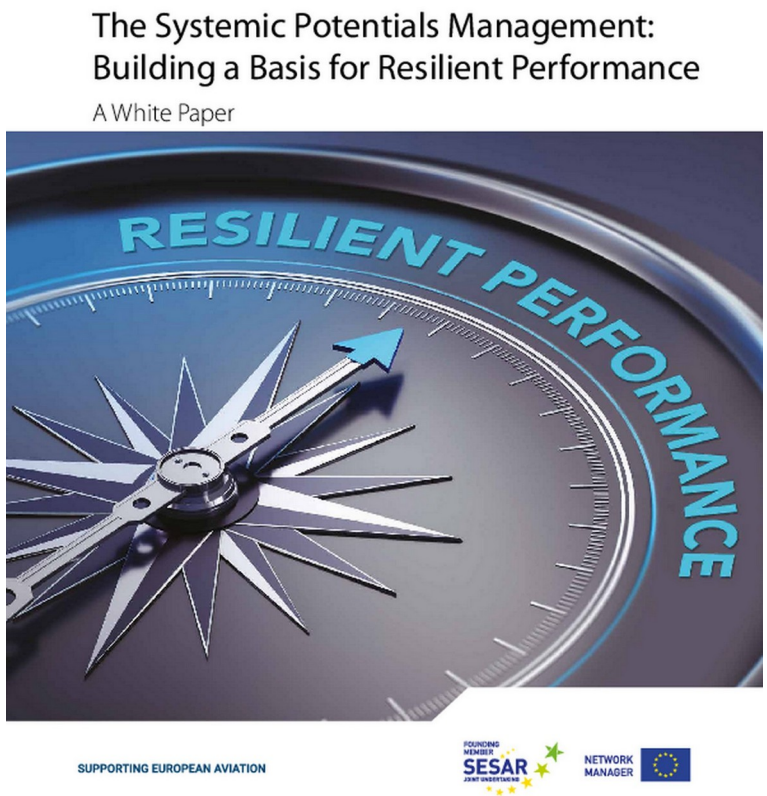


Pickup et al. (2017). Blood sampling - Two sides to the story. Applied Ergonomics, 59, 234.242

Conclusion

Safety is a non-trivial problem, that requires a non-trivial solution

Safety culture is a trivial solution, without a clear theoretical or scientific basis

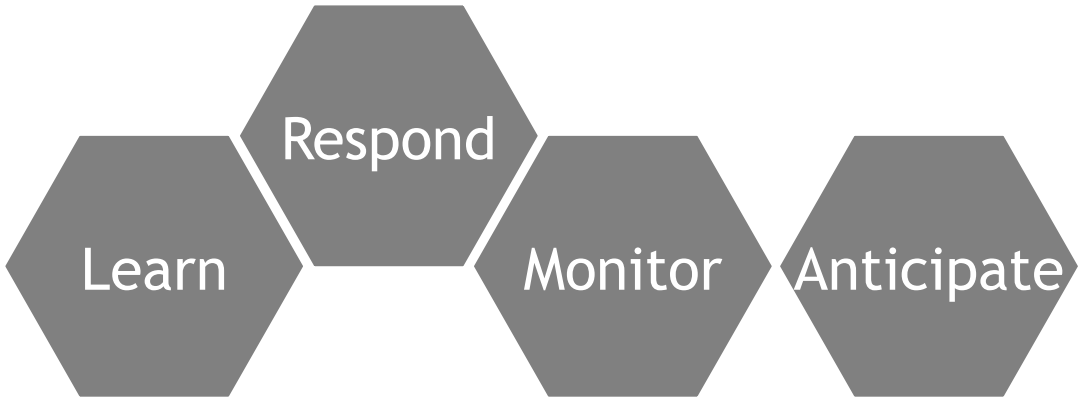


Get the report here:
www,skybrary.aero

Potentials for resilient performance

The four potentials for resilient performance can be used as proxy measures of the "position" of an organisation, i.e., how well it functions.

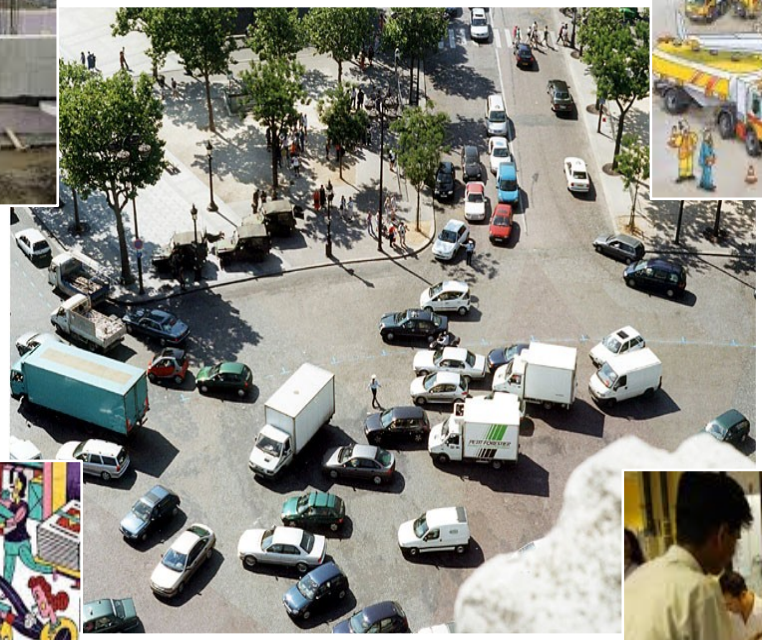
An organisation's performance is resilient if it can function as required under expected and unexpected conditions alike (changes / disturbances / opportunities).



Resilient performance requires that an organisation has the potentials to respond, monitor, learn, and anticipate.

Why Do Most Things Go Well?

- By **responding** in a flexible way

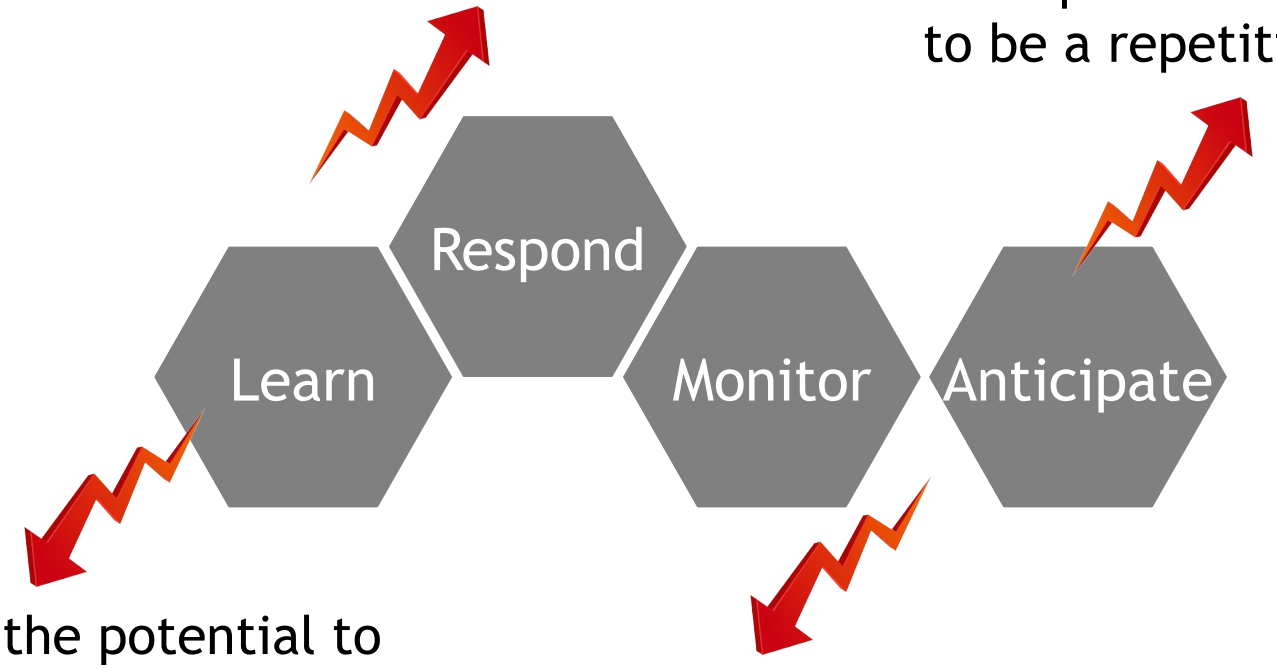


- By **monitoring** what goes on
- By responding flexibly to what happens
- By **learning** from what works and what doesn't
- By **anticipating** - and by looking ahead

Why the four potentials are needed

Without the potential to respond, threats and opportunities will go unanswered.

Without the potential to anticipate the future is assumed to be a repetition of the past.



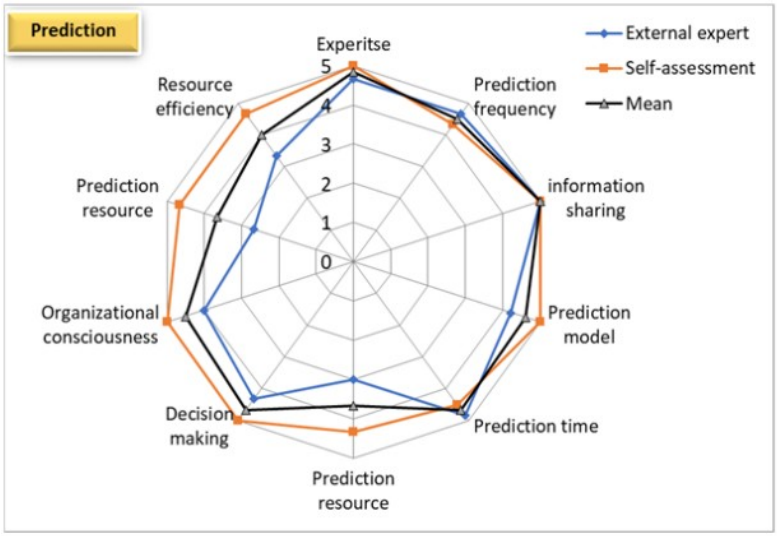
Without the potential to Learn, the system will always respond in the same way and rely on the same indicators.

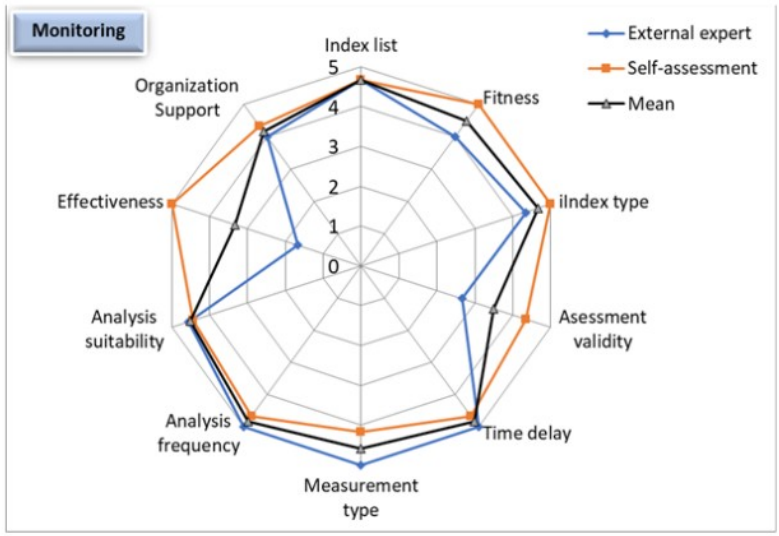
Without the potential to monitor, everything that happens will be a surprise

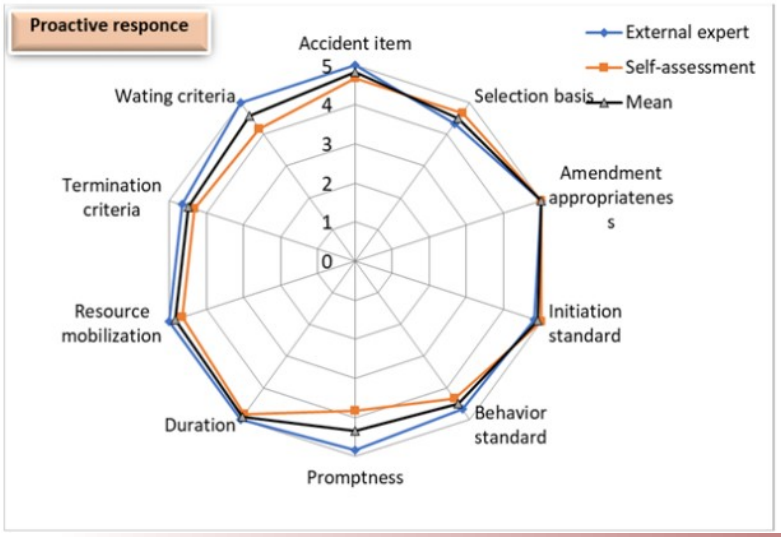
SPM profiles in use

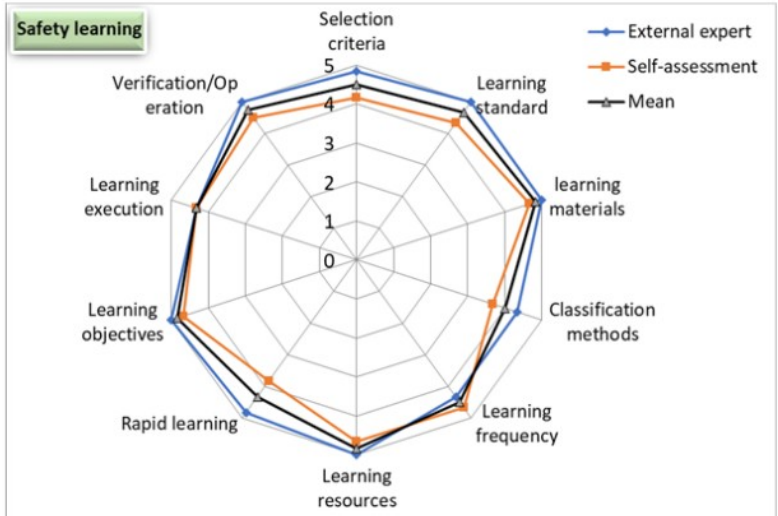
RAG: Resilience Assessment Grid

How well is an organisation able to Respond, Monitor, Learn and Anticipate?

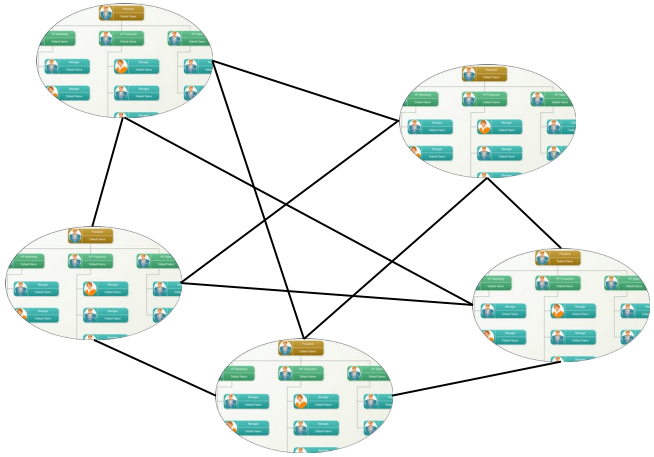






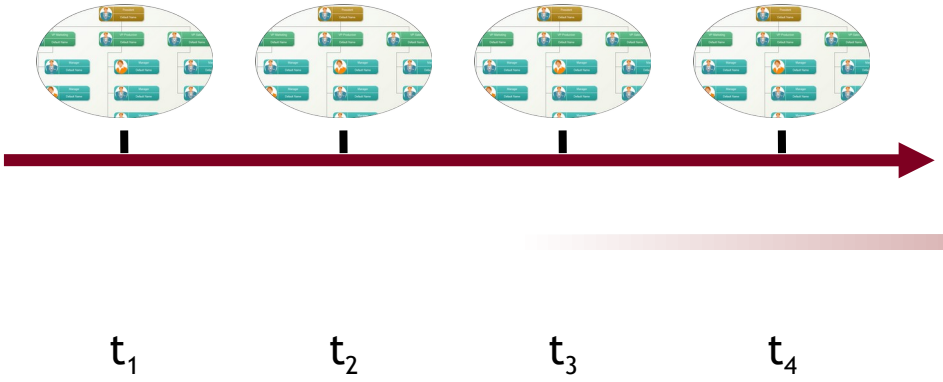


To compare or not to compare?



The RAG should not be used to compare different organisations ...

The only fair comparison for an organisation is the organisation itself – over time. Organisations can possible be compared in terms of distinct outcomes, but not in terms of the "internal" processes.



... but only to "compare" an organisation to itself over time.

Changing culture or changing behaviour?

Safe tysyn thesis

Focus on the culture itself, and try to change that.
According to theory, changes to espoused values and assumptions, will lead to a change in behaviour or performance, in the intended and desired direction.
In the traditional safety culture approaches this is achieved by changing the 'hearts and minds' of people.
Safety culture is therefore what you are or have, it is a position at a given level.

Focus on the practice (behaviour) and try to change that.
As long as people reflect on what they do, a change in practice will also lead to a change in attitudes, in espoused values and assumptions.
It is much easier to change practices than to change 'hearts and minds' and also much easier to see whether it works.
A culture of resilience can be established by changing the ways in which the organisation responds, monitors, learns, and anticipates.
This requires looking at what goes well (Safety-II) rather than looking at what goes wrong (Safety-I).

Not a simple problem

How to develop a healthy organisational culture for safety

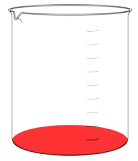
It is a Non-trivial problem!!!

It therefore does NOT have a trivial solution.

"Healthy organisational culture" is subjective, it is not well defined, and does not describe an operational goal or condition.

"Safety culture" has two different meanings:

Safety-I: As little as possible goes wrong.



Safety-II: As much as possible goes well.