

SAFETY-II AS A MANAGEMENT PRINCIPLE

IMPLICATIONS FOR MANAGING AND DEVELOPING AN ORGANIZATION

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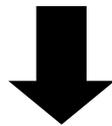
Safety-I: without unwanted outcomes



3. DEFINITIONS

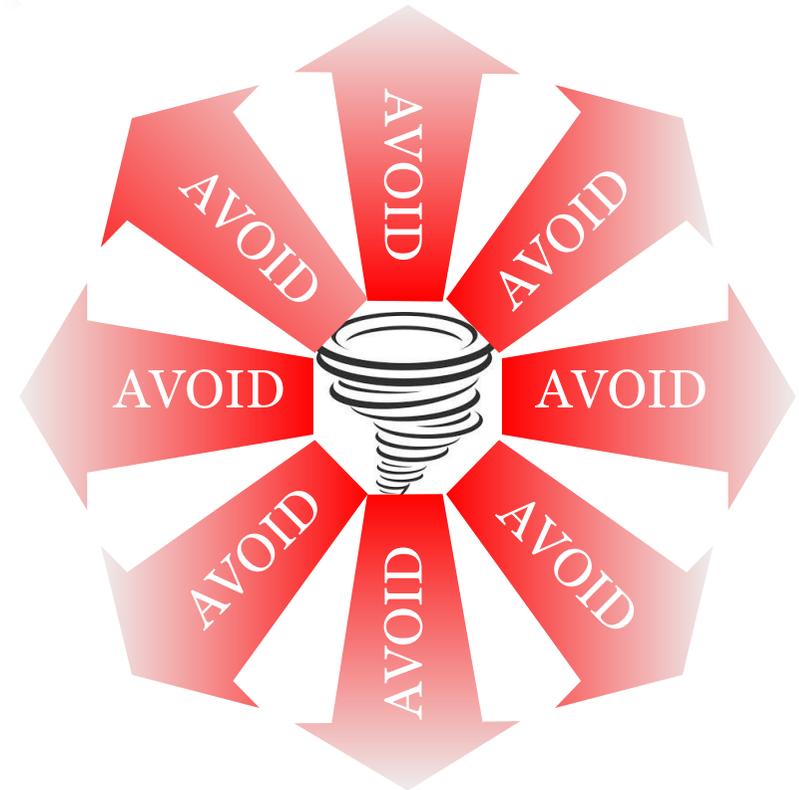
3.20 **Safety.** Freedom from unacceptable risk.

Negative outcomes are caused by failures and malfunctions.



Safety-I:

Analyse accidents and incidents to prevent or eliminate what can go wrong.



(M)any direction(s) will take you away from what you want to avoid

Managing Safety-I

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

The belief in causality (Causality Credo)



- (1) Adverse outcomes happen because something has gone wrong (cause-effect thinking + value congruence between cause and effect).
- (2) Causes can be found and treated (rational deduction).
- (3) All accidents are therefore preventable (zero harm principle).



Prevent, eliminate, constrain.
Safety, quality, etc. are different and require different measures and methods.

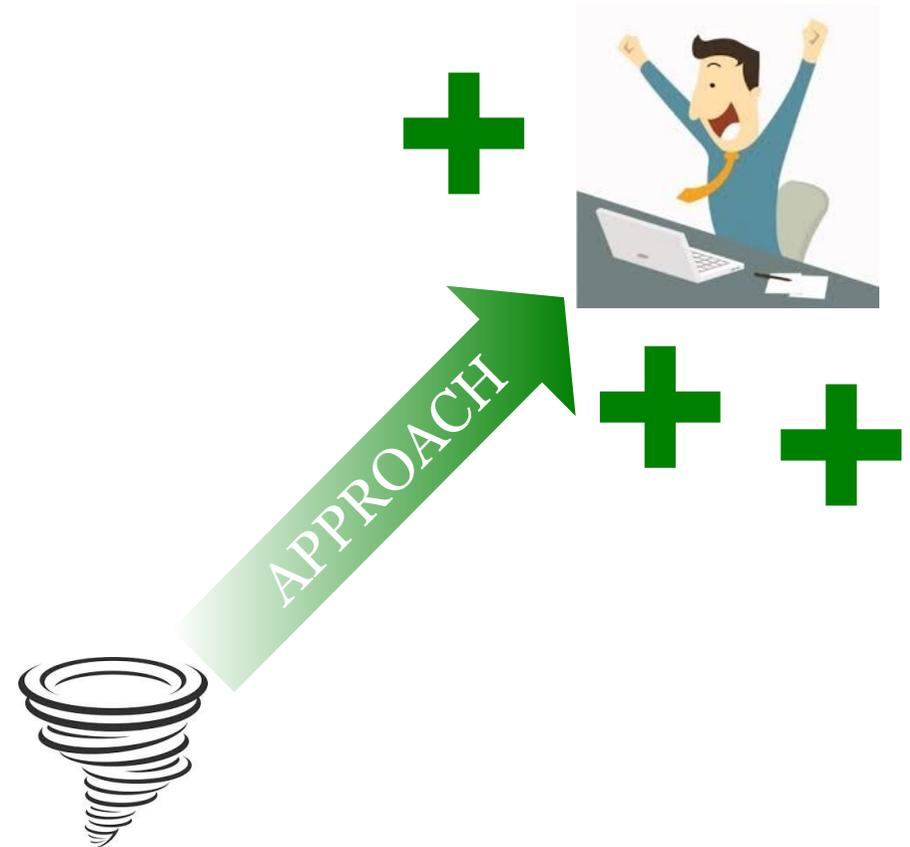
Safety-II: with wanted outcomes

All outcomes (positive and negative)
are the result of performance
variability.



Safety-II:

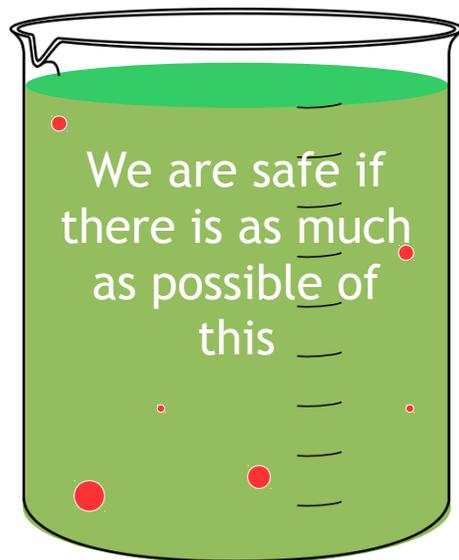
Support or facilitate what goes well by
studying everyday performance.



... but only one direction will bring you
closer to what you want to attain.

Managing Safety-II

Safety-II is a condition where as much as possible goes well.



Support, augment, facilitate.
Safety, quality, etc. are inseparable and need matching measures and methods.

1. Care about what happens all the time rather than what happens rarely. We always count the number of times something fails, but rarely the number of times it just works.
2. Look for 'work-as-done' - the habitual adjustments and why they are made. When something is done, as a part of work, it has usually been done before and gone well before.
3. Learning should be based on the frequency of events rather than their severity. Small improvements of everyday performance may be more important than large improvements of rare performance.

Management is like travelling



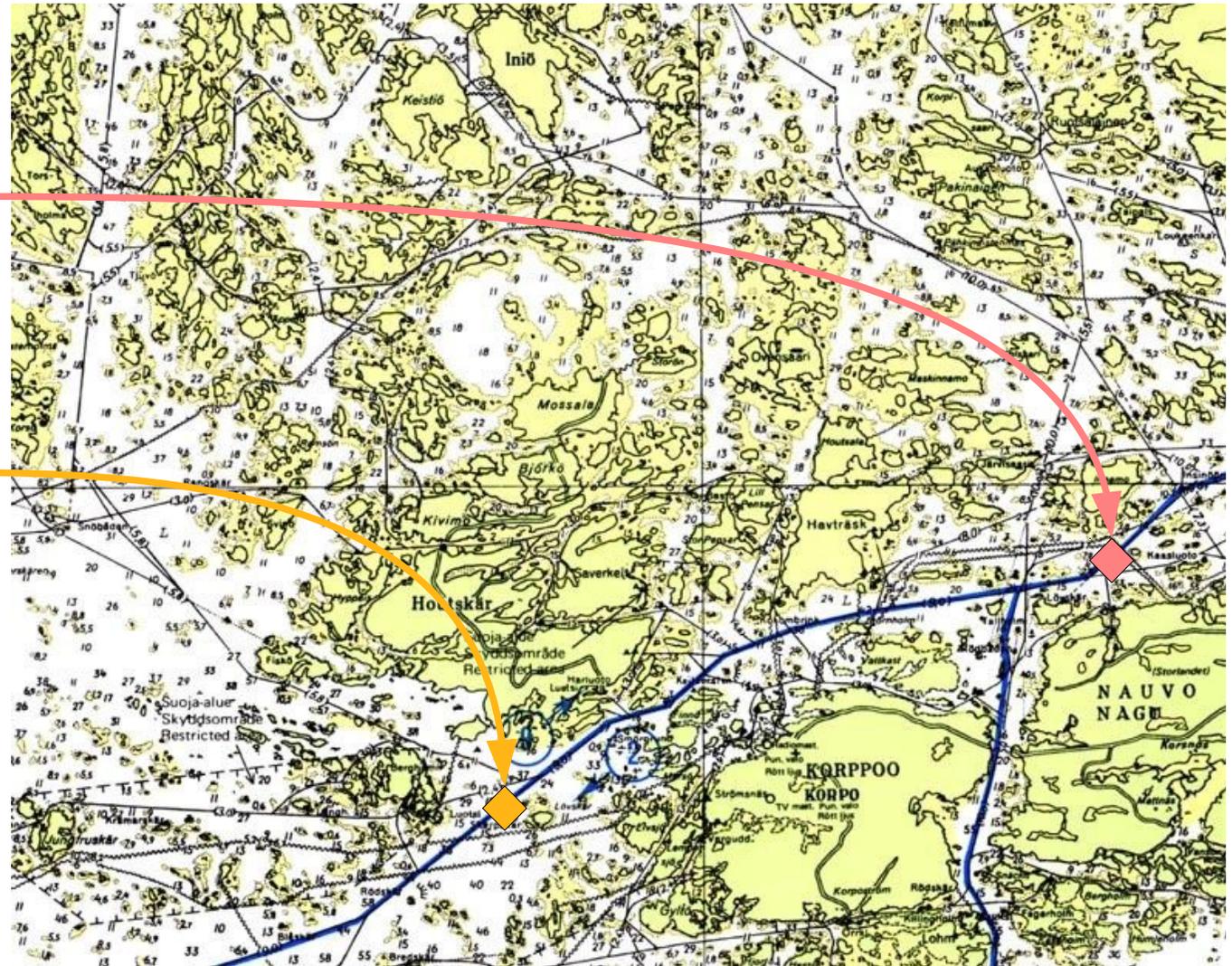
GOALS or TARGETS:
Where do we want to be?
When should we arrive?



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



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



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?



3. DEFINITIONS

3.20 Safety. Freedom from unacceptable risk.



With Our Highest Level of
OSH Expertise
We Will Realize the Lowest Rate of
Occupational Accidents

Safety is the activity of ensuring that accidents are avoided.

$$\text{Safety} = \sum_{1}^{n} \text{Accident}_i$$



Goal: The “zero accident” approach

OUR PURPOSE

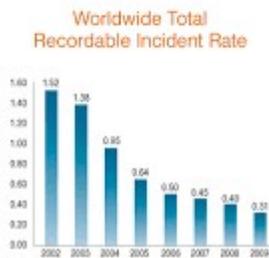
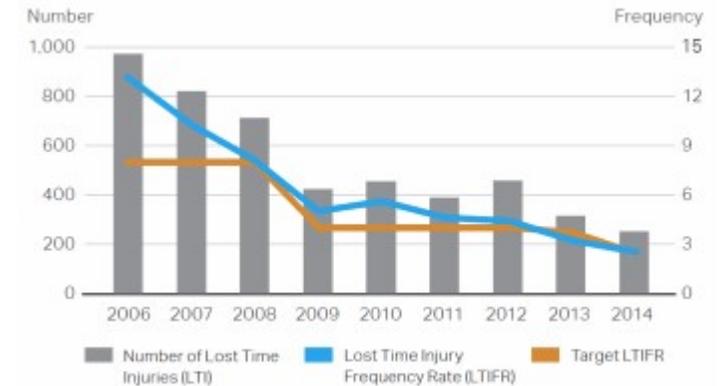
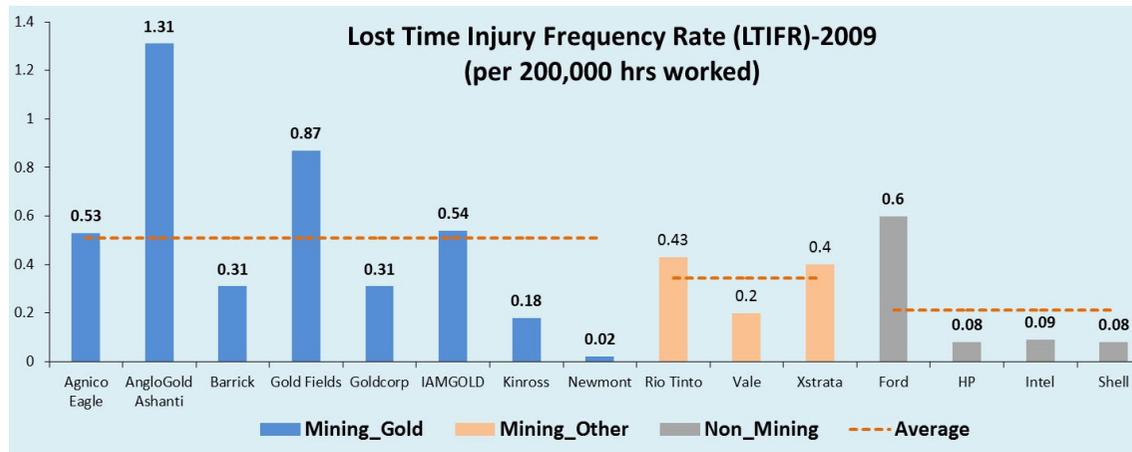
To produce [X] safely, securely and profitably - without harm to people or the environment.

OUR BELIEFS and GUIDING PRINCIPLES

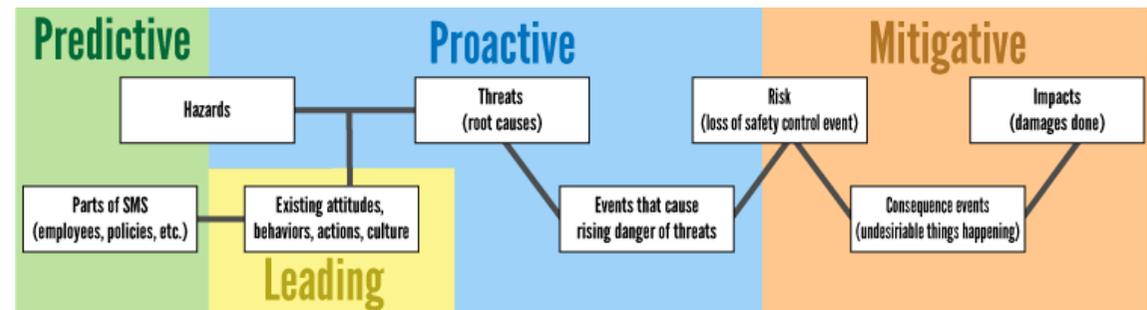


1. Safe production is our most important goal.
2. **All injuries and environmental incidents are preventable.**
3. Any task that can't be done safely without harm to the environment will not be done.
4. **Each person is accountable for his or her own safety, the safety of their coworkers and protecting the environment.**
5. Each person is expected to identify hazards and manage risks to people and the environment.
6. **Each person must have the necessary skills to work safely and protect the environment.**
7. Working safely with respect for people and the environment is a condition of employment.

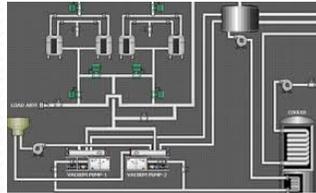
Safety: What is the position?



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

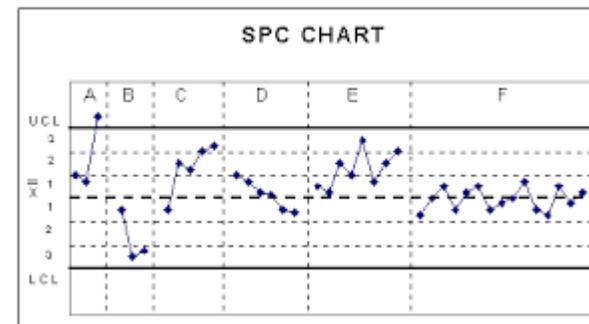
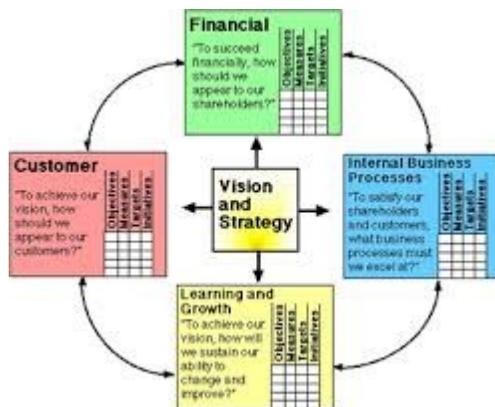
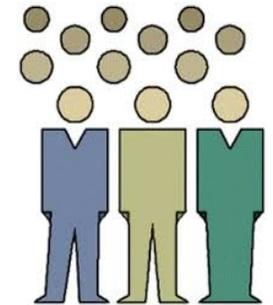


How do we know where we are?



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

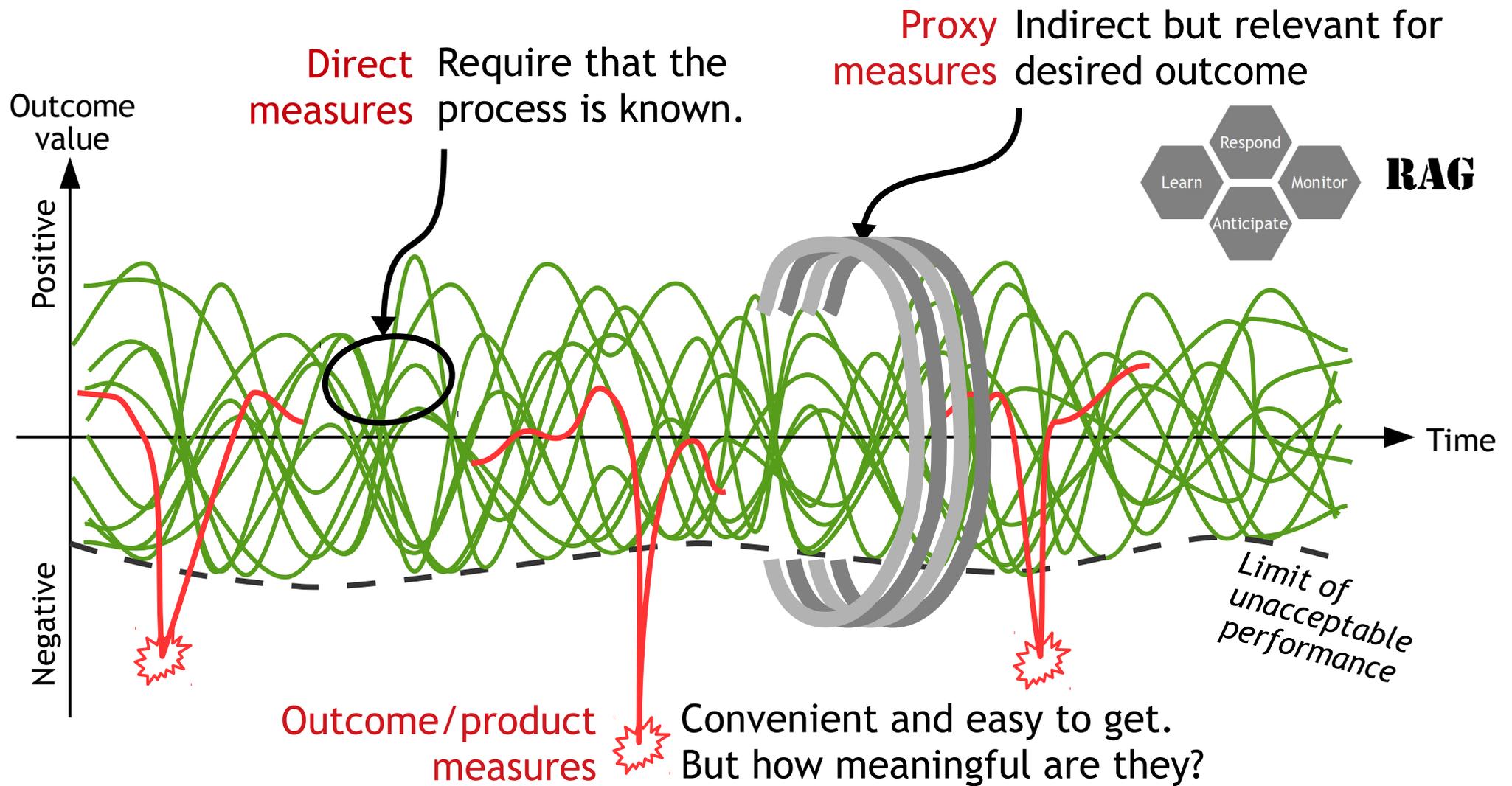
Organisations “grow” but are not built. We know little of how they actually work and it is therefore difficult to define meaningful measurements.



$$CPI = \frac{\sum_{i=1}^n CPI_i \times weight_i}{\sum_{i=1}^n weight_i}$$

Consumer Price Index

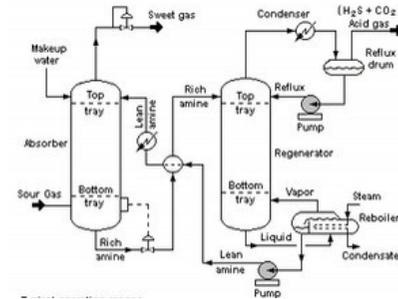
Management requires measurements



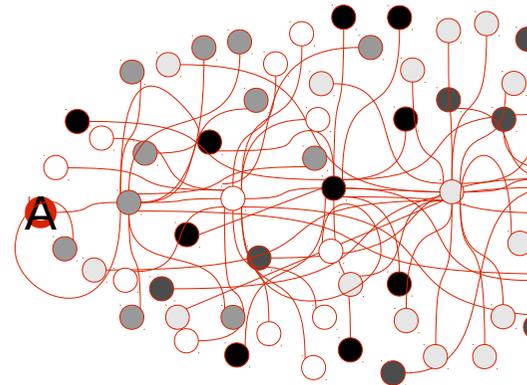
Means: Understanding systems



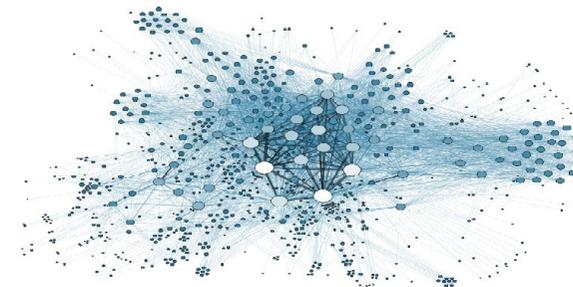
Simple system
(technical)



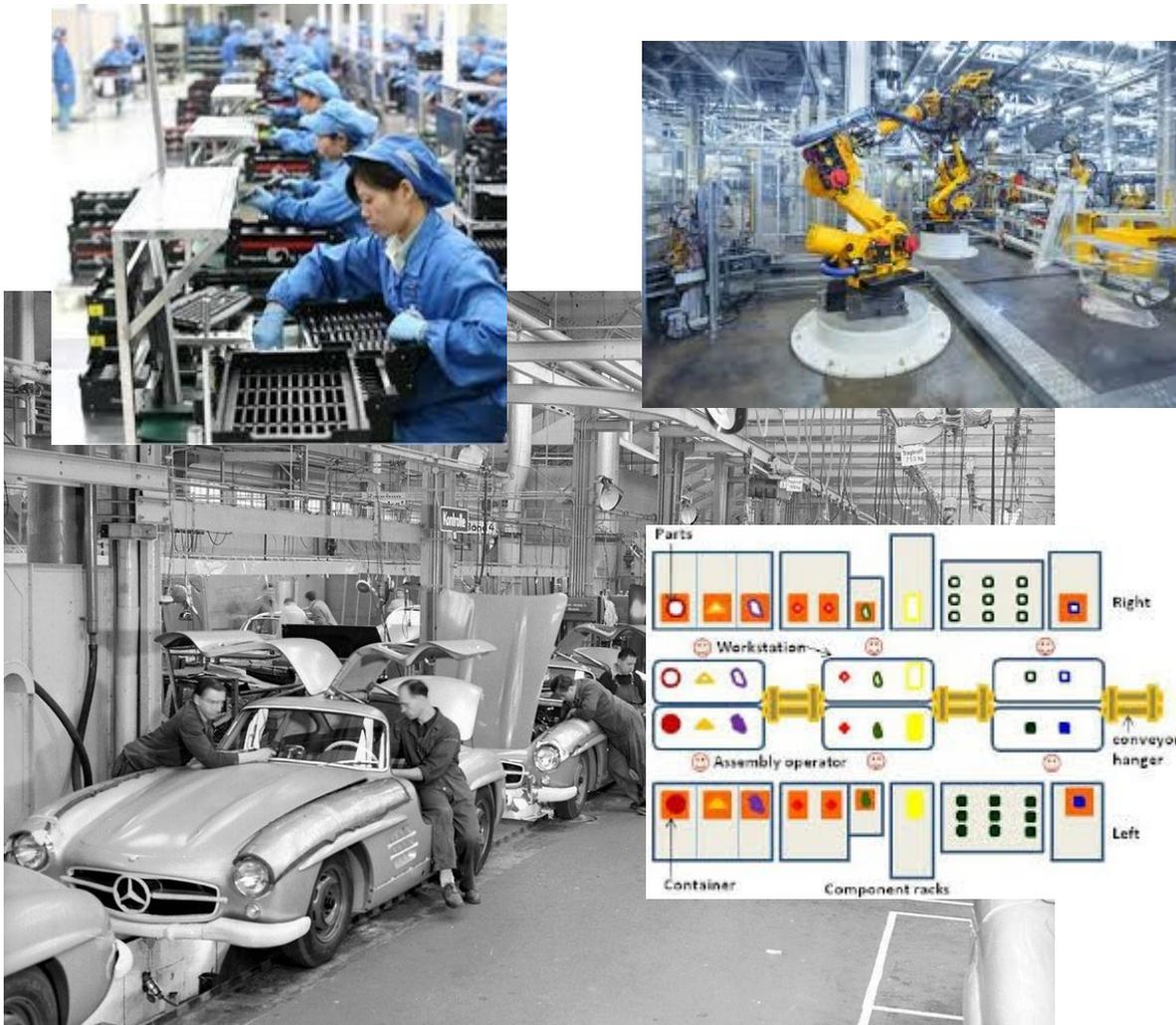
↓
Complicated system
(socio-technical)



↓
Complex system
(intractable)



Tractable systems



Simple descriptions
with few details
(technology, people)

Principles of
functioning are
known

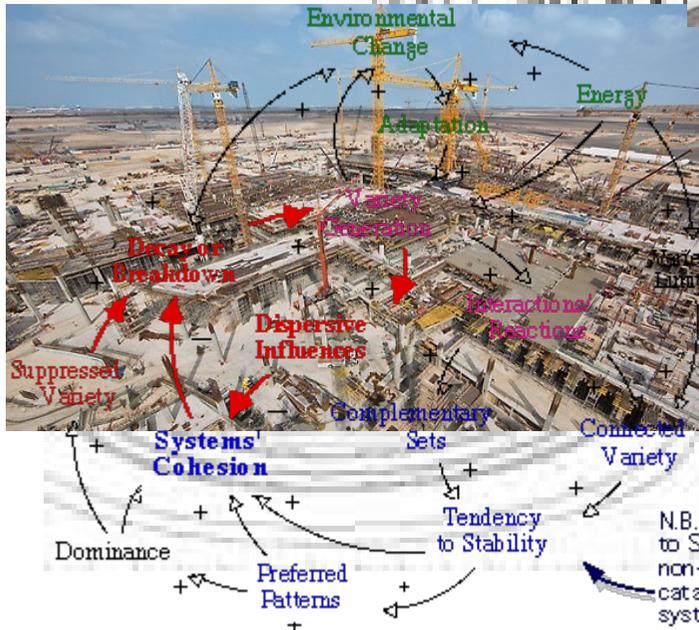
System does **not**
change while being
described

Intractable systems



Elaborate descriptions with many details

Principles of functioning are partly unknown



System changes before description can be completed

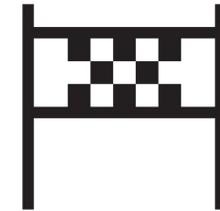
Goals, position and means



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

Looking at the big picture

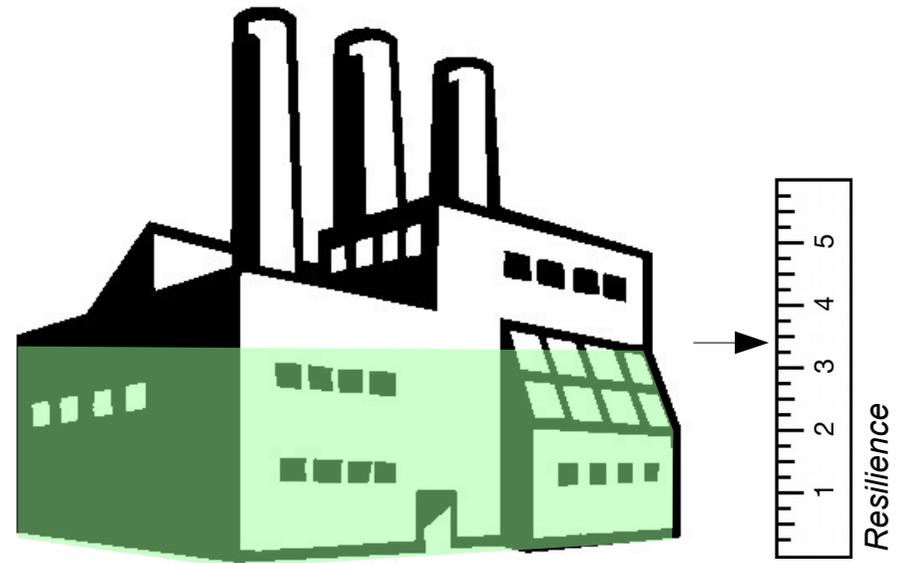


Resilience is a quality or a characteristic of how an organisation or a system, and the people in it, performs in general – not just with regard to safety.

It refers to how well an organisation **functions** overall.

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

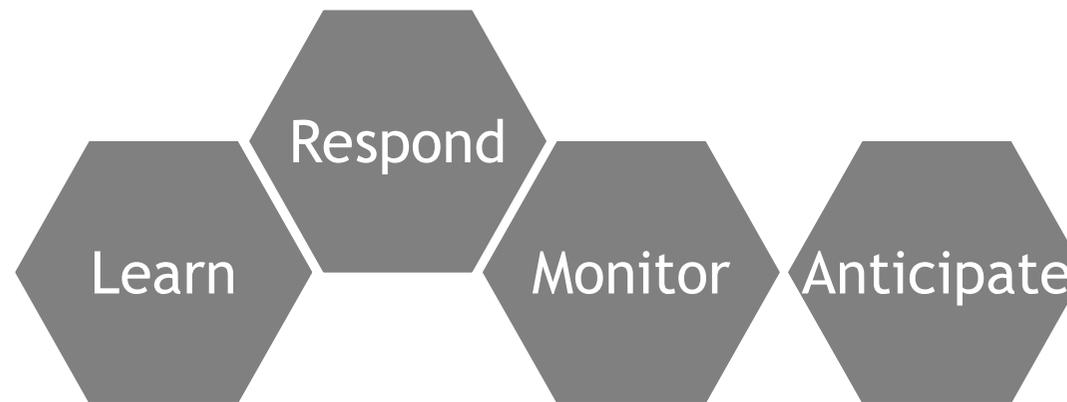
We cannot increase an organisation's resilience, but we can improve the potentials for resilient performance.



Potentials for resilient performance

Resilience is an expression of how people and organisations cope with everyday situations - large and small – by adjusting their performance to the conditions.

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

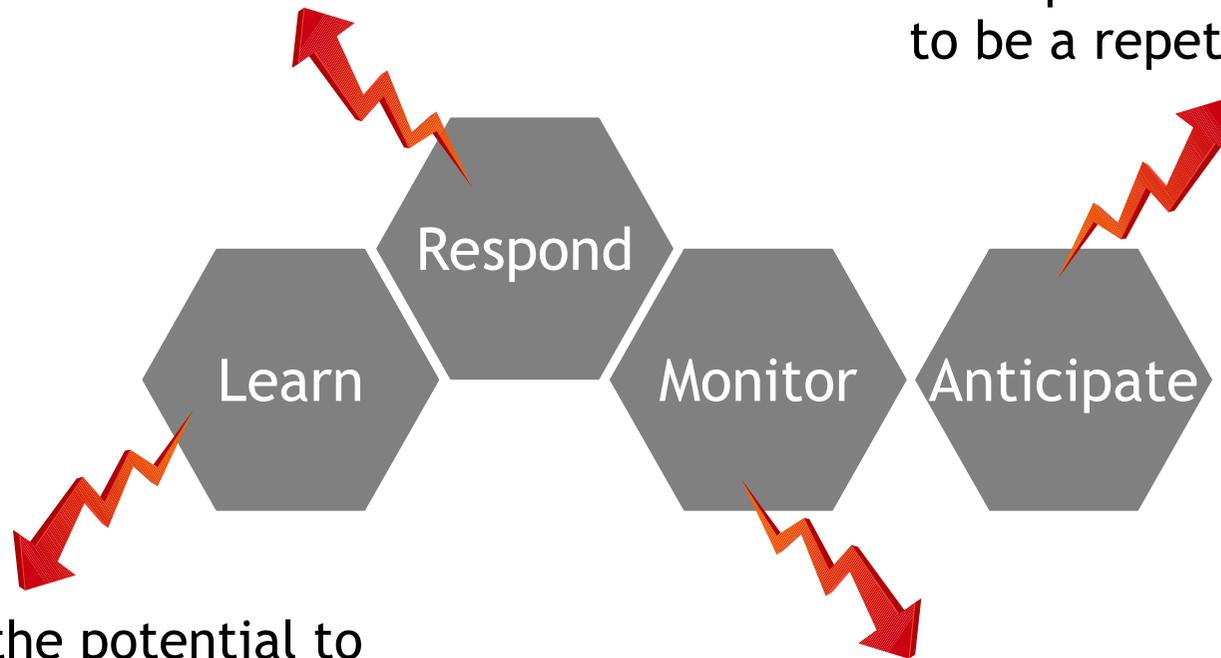


Resilient performance requires that an organisation has the potentials to **respond**, **monitor**, **learn**, and **anticipate**.

Why 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

As high as reasonably practicable



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?

...

The Resilience Assessment Grid (RAG) SafetySynthesis



		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.

Resilience Assessment Grid (RAG)

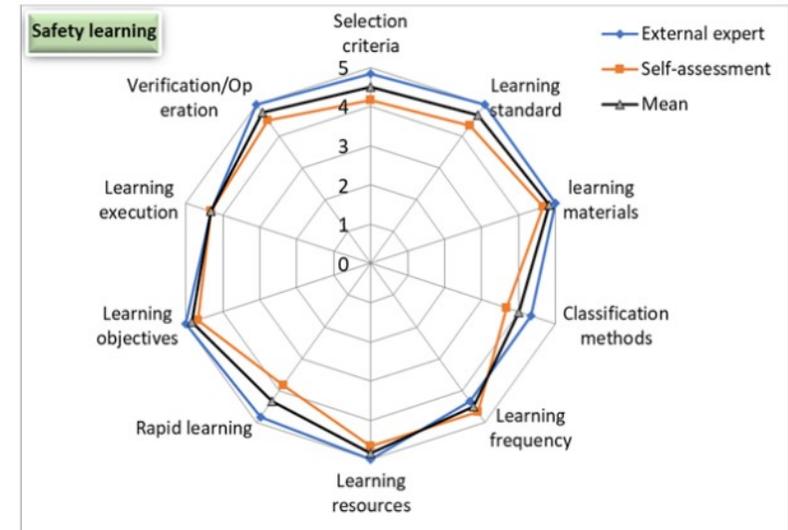
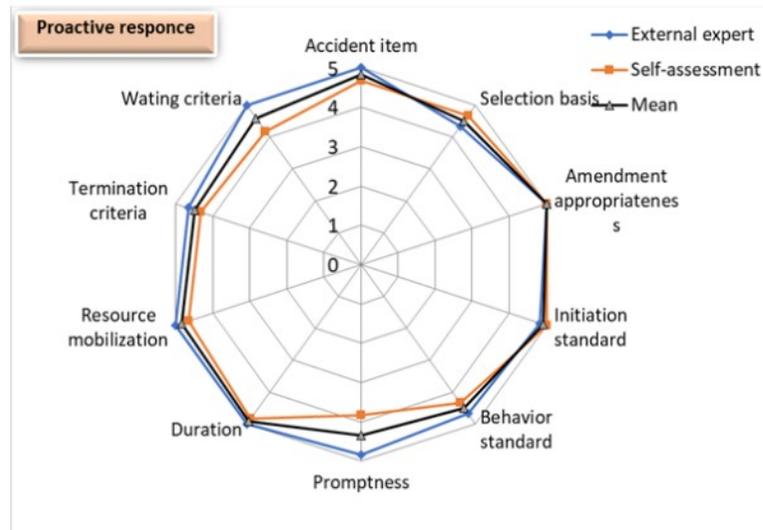
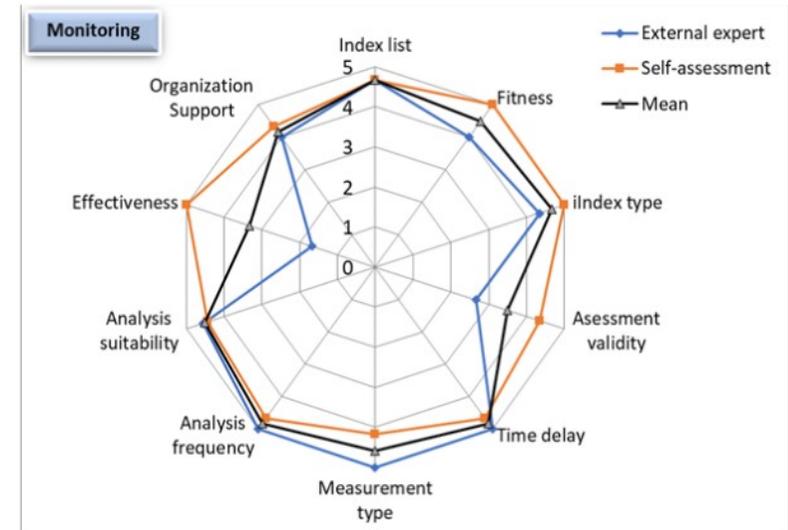
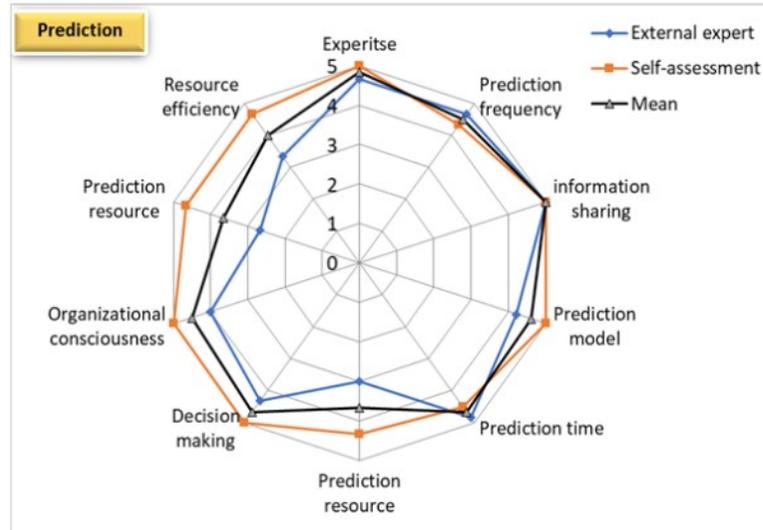


RAG profile for the ability to respond (constructed example)

Resilience Assessment Grid

RAG: Resilience Assessment Grid

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



Prata med grannen



Hur definierar man hur säker man vill vara? Vad är målet?

Hur kan man mäta, om man är på väg mot målet? Och med rätt hastighet?

PRINCIPLE 1

ACCEPTING PEOPLE AS COMPLEX, EMPOWERING them AS the SOLUTION

SAFETY II

SAFE. SIMPLE

PRINCIPLE 2

LEARNING from WHAT GOES RIGHT

0.5% GOES WRONG

99.5% GOES RIGHT

WAI (WORK AS INTENDED)

WAD (WORK AS DONE)

DEFIANT FAILURE

WORK INSIGHTS
STUDY of NORMAL WORK

1. DISCOVERY
2. ANALYSIS
3. ACTION
4. EVALUATION

FIXED SOME FLEXIBILITY ADAPT & FLEX CONTINUOUSLY

the BLUNT END the SHARP END (THINK CLOSELY & TAKE NOTICE)

PRINCIPLE 3

SAFETY IS AN ETHICAL RESPONSIBILITY

WE LEARN from our MISTAKES

CULTURE of LEARNING, TRUST & ACCOUNTABILITY

SAFETY of WORK VS SAFETY WORK

HOW DO WE LIGHTEN the BACKPACK?

LEARNING TEAMS

WORK AS DONE

WORK AS INSIGHT

SELF

HINDSIGHT BIAS

SHOULD HAVE / COULD BE / WOULD BE

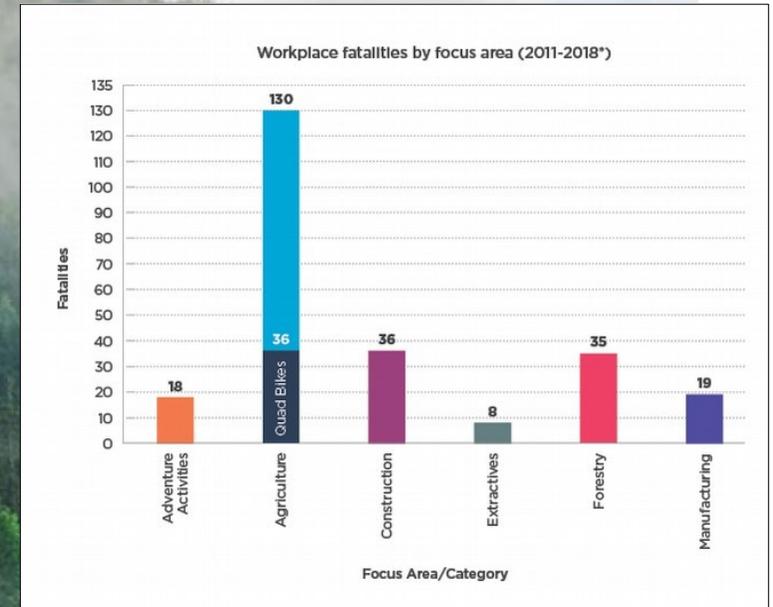
ATTRIBUTION BIAS

HUMAN CENTERED MINDSET

Learning from Work-as-Done in NZ logging *Safety Synthesis*

Response To Fatalities: Fix the failures

- Independent Forestry Review
- Increase mechanisation
- Increase regulation
- Increase certification
- Improve access to information: SafeTree



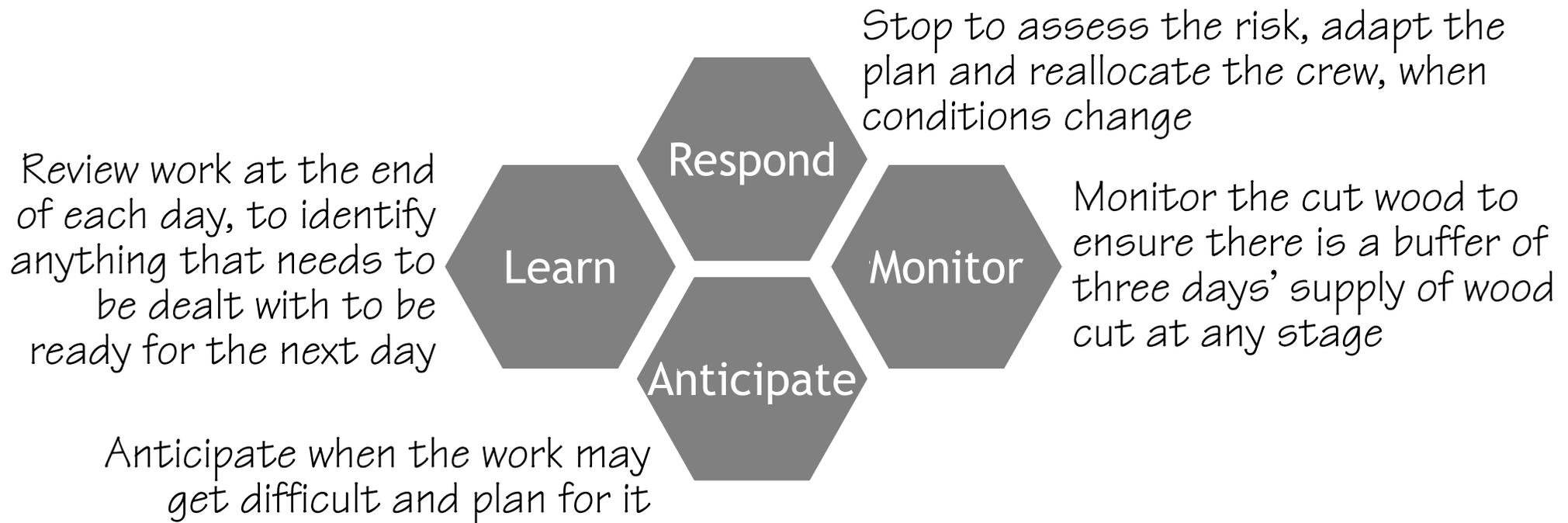
Dr. Hillary Bennett



Lessons from the Learning Teams

Emerging Themes

Inclusive, visible and approachable leadership
Trust, respect and confidence
Teamwork, common goal and collaboration
Cross functional knowledge and skills
Work practices



Conclusions

The consequence of adopting a Safety-II perspective is not that safety should be managed differently.

The consequence is rather that something other than safety should be managed.

The focus should be an organisation's potentials to function as required under expected and unexpected conditions alike (changes / disturbances / opportunities).

The goal is to establish, grow, and maintain the potentials.

The position is the current assessment of the potentials (resilience profile).

The means are to define and implement or sustain changes to the potentials on a functional rather than a structural basis.

It is the dilemma of safety management is that we inadvertently create the complexity of **tomorrow** by trying to solve the problems of **today** with the mindset of **yesterday**.