

# Safety II

(The mindset of tomorrow?)



What is it?



Learning from “normal” operations



Building operational Resilience



Guided Adaptability

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

— **Erik Hollnagel**, Safety-II as a management principle, implications for managing and developing an organization

- “People do not come to work to do a bad job.
- Safety in complex systems is not about getting rid of people, or reducing their degrees of freedom.
- Safety in complex systems is created by **people** through practice—
- at **all** levels of an organization.”

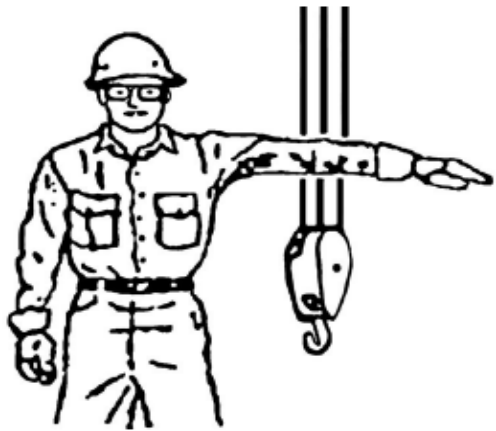
— **Sidney Dekker**, The Field Guide to Understanding Human Error

# Thoughts for the Day?



# Classical View of "Safety"

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



“Identification and measurement of adverse events is central to safety.”

~~Malfunction, non-compliance, error~~ → ~~Failure (accidents, incidents)~~ → Unacceptable outcomes ☹️

“Find, fix - and forget” **Often referred to as "SAFETY I"**

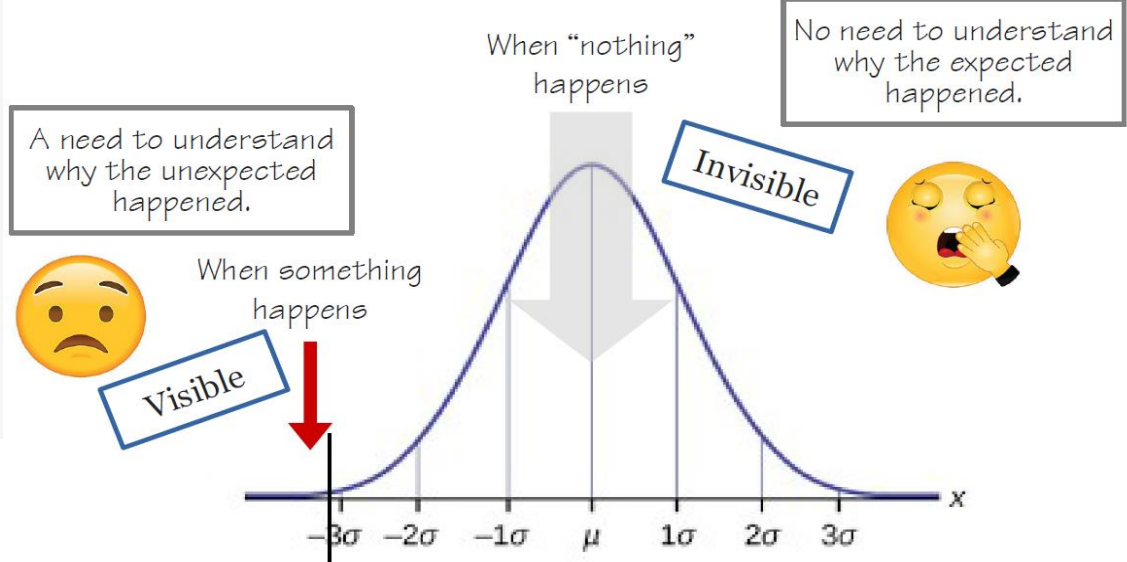


# Find it? Incident Investigation

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- Act of God?
- Root Cause?
- Human Error?
- Organisational Culture?
- Complexity -
- Or Normal? (Perrow)

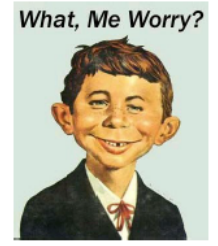




# Learning From "NORMAL" OPERATIONS

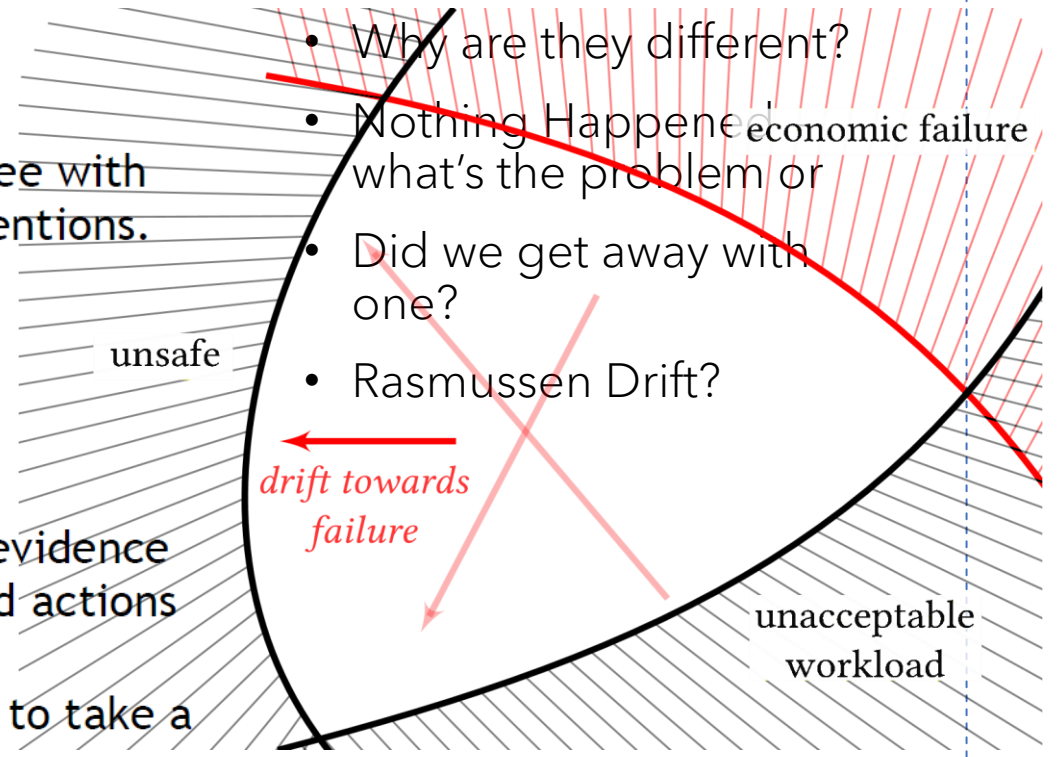
Accidents conflict with our expectations and intentions.

Acceptable outcomes agree with our expectations and intentions.



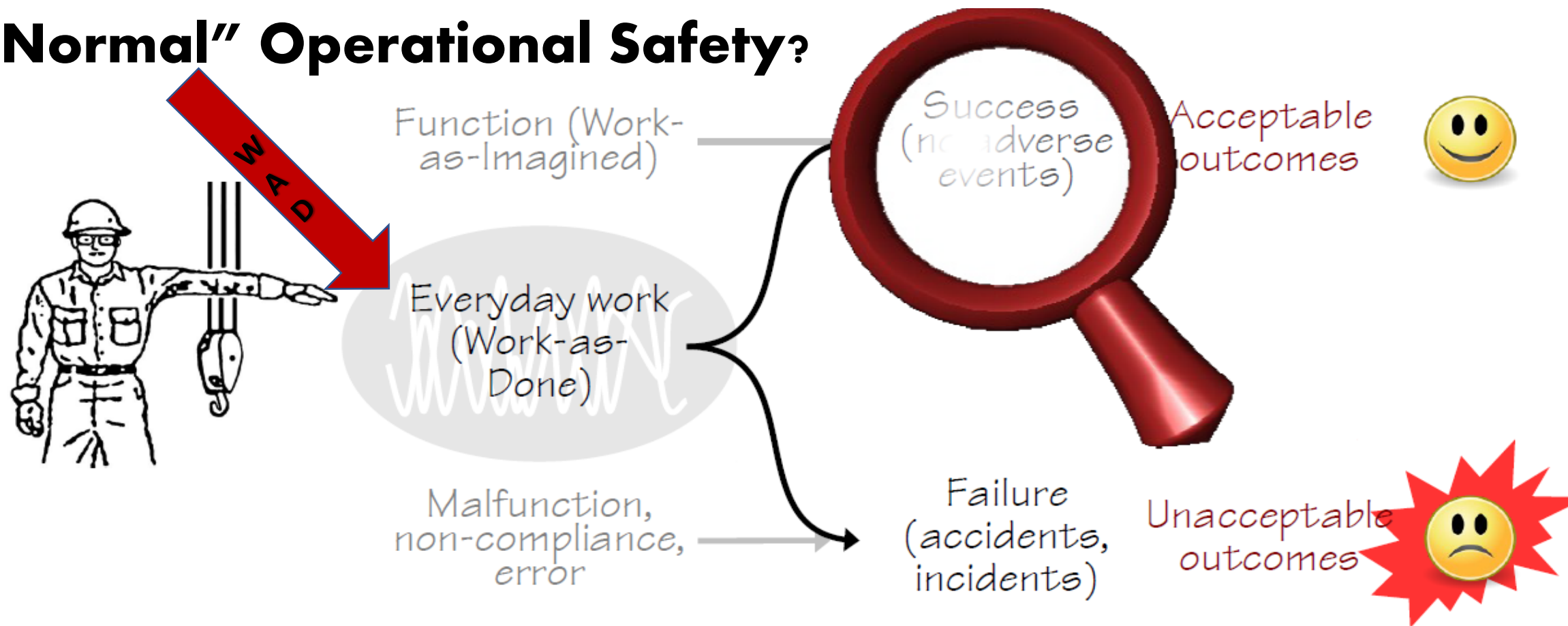
Accidents are evidence that our understanding is incomplete or deficient.  
We therefore have to improve our understanding.

Acceptable outcomes are evidence that our understanding and actions are correct.  
There is therefore no need to take a closer look.



Understanding the variability of everyday performance is the basis for **SAFETY II**

## “Normal” Operational Safety?

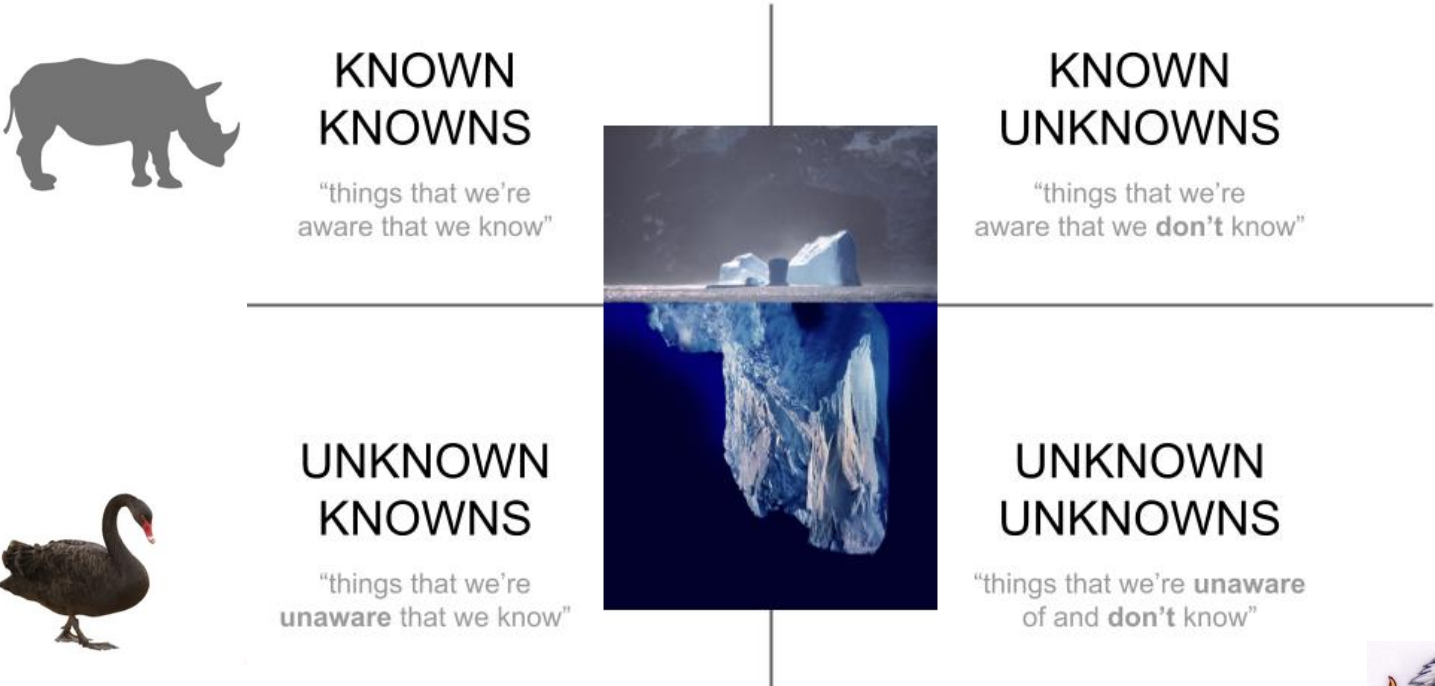
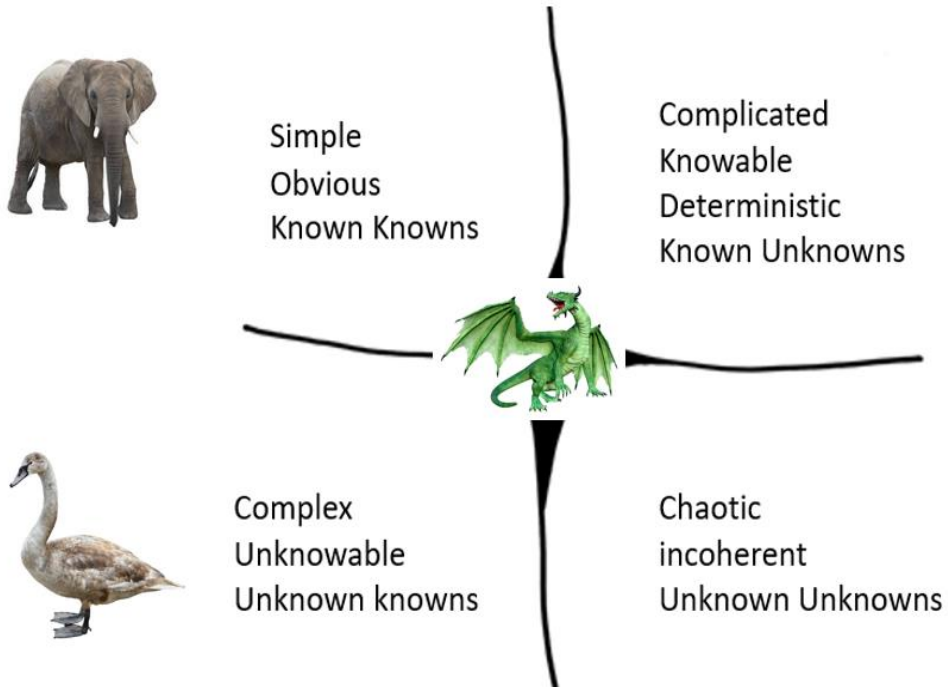


Constraining performance variability to remove failures will also remove successful everyday work.





# Real Systems are not simple



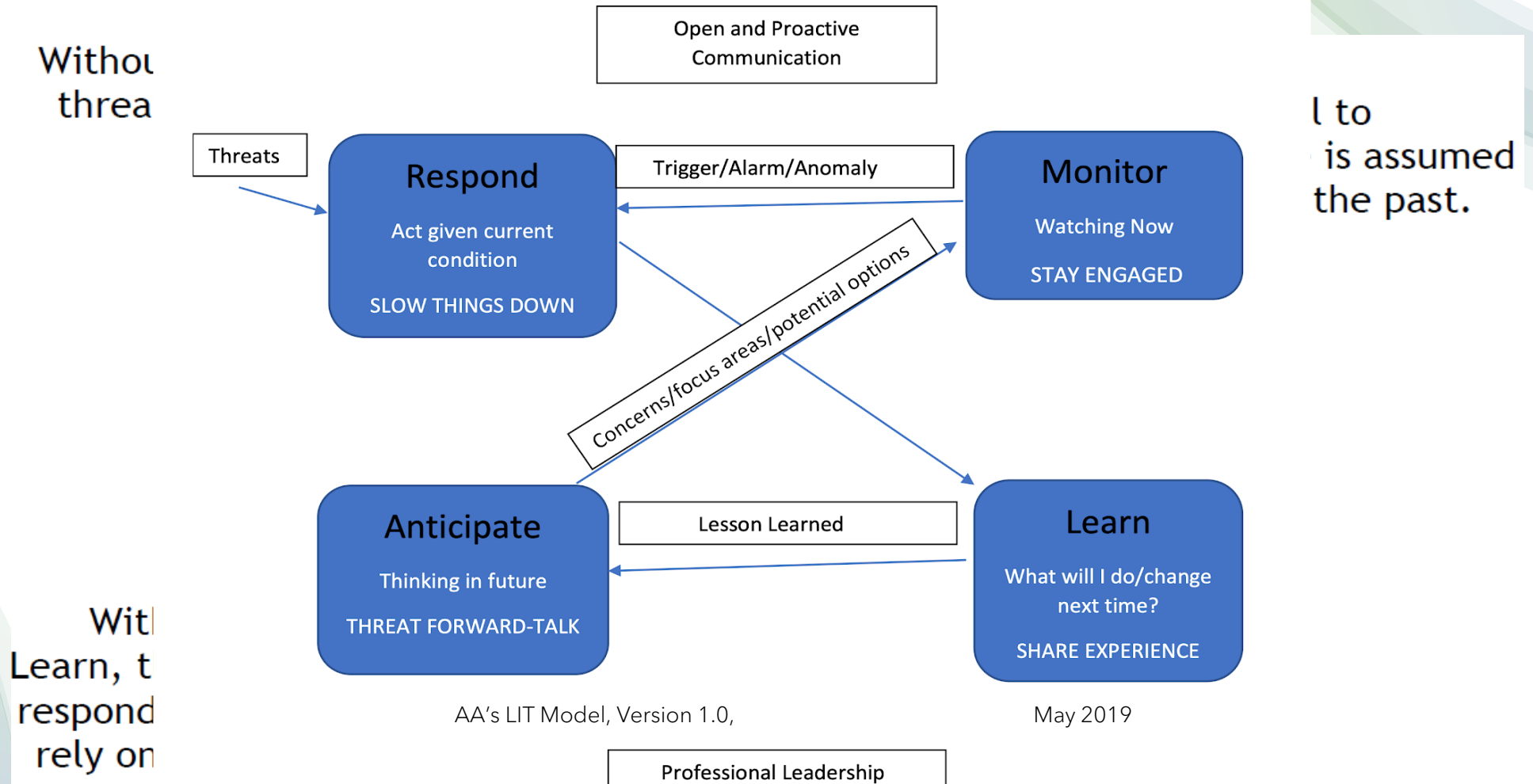
# So what can we do about it?

- Recognise Reality
- Chaos happens – we don't necessarily control everything!
- We live in a complex environment, but we evolved to survive in a complex environment.
- Plan – yes!, Train – yes! Checklists, procedures, SMS's, manuals help. (if you've got time to read them?)
- But is "robotic" / automatic Plan Do Check Act sufficient?
- We need to be RESILIENT?





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



# HOLLNAGEL RESILIENCE POTENTIALS

**Any System with Human involvement is by definition “Complex”**

**RESPOND**

**But Humans can be Complex Adaptive Responders  
–So train them, empower them!**

Manchester NHS

London Bridge NHS and Police

“Near Misses”

Work arounds

Covid Vaccines

NATS



# Humans – Can Make Intelligent responses

## Flights disrupted after computer failure at UK control centre

Aviation – NATS - John Holmes' Black Swan –

“Planes have already taken off!”

- ATC staff adapted well to stabilise the operation
- Key staff involved in the incident were highly skilled and had well understood roles that they delivered efficiently

**“Our options evaluation and decision making relied heavily on highly trained, skilled, adaptable and empowered people”**





# New Zealand Loggers

SAFETY I Response To Fatalities:  
Fix the failures

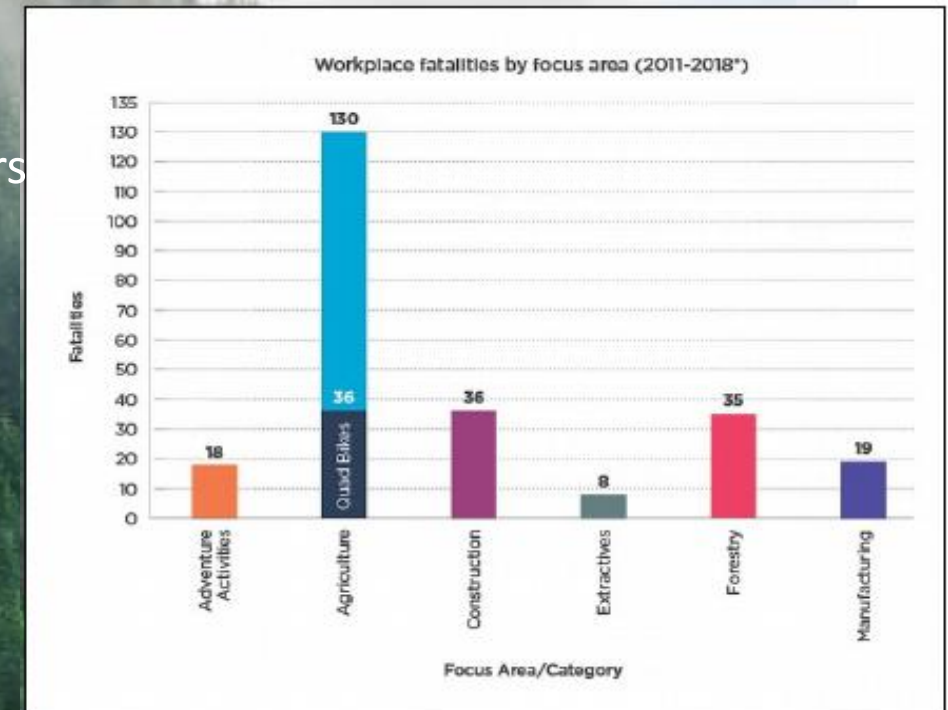
- Independent Forestry Review
- Increase mechanisation
- Increase regulation
- Increase certification
- Improve access to information:

Wide range of safety performance by different teams of loggers

SAFETY II Response:

How are the best performers managing to work more safely?

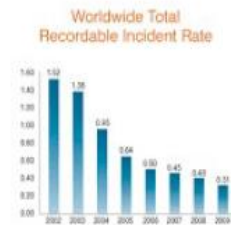
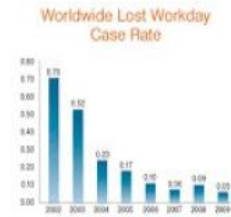
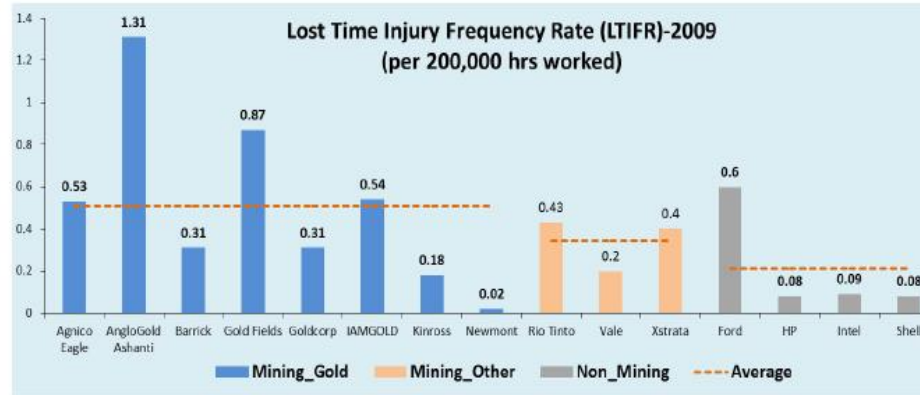
- Work with the best team (WAD)
- Learn their successful ways of working
- Share the learnings and encourage/ formalise "fixes", "edges" and initiatives



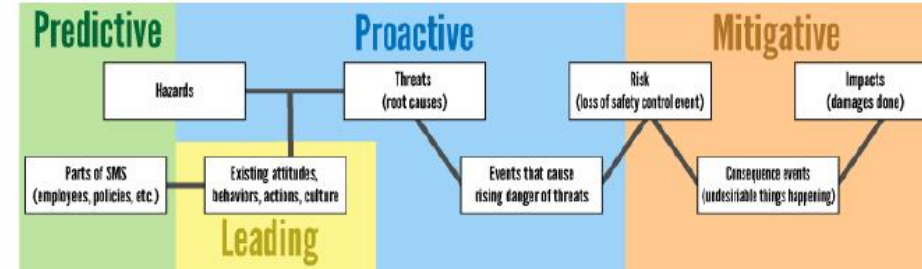


# Monitoring What?

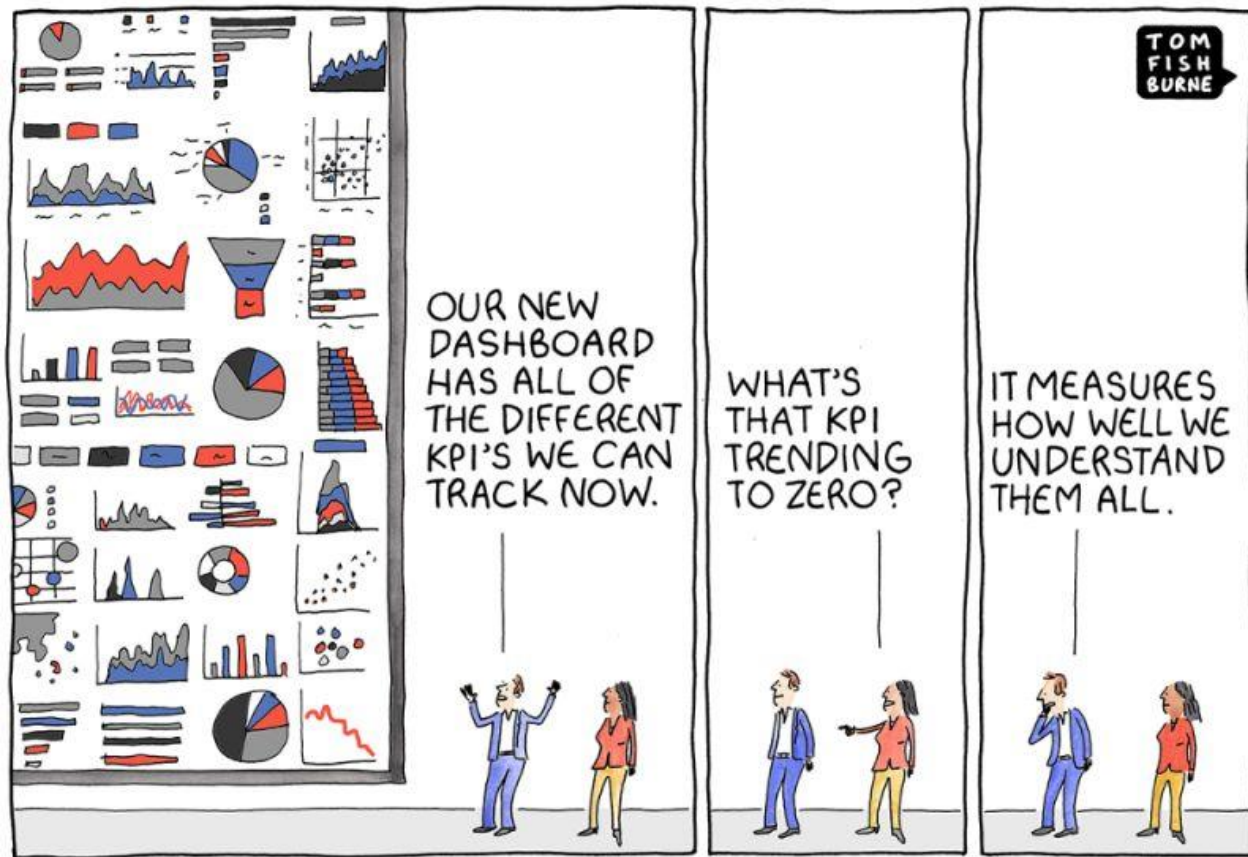
**MONITOR**



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



# What's it telling us?



© marketoonist.com

- How do you define how safe you need to be?
- So how "safe" are we?
- Do we really know (or want to know) exactly what's going on?
- What happens, when "nothing" happens?



This will solve your problems

Macro



Why are there different ideas about what actually goes on?

### Work as Imagined WAI

Will this solve our problems?

Meso



## Work as Done WAD



### Work as Intended WAI

This doesn't solve our problems

Micro



And how can they be reconciled?

### Work as Reported WAR





# LEARN – Really?



So, it can never happen again!

(The politician's answer!)



But it does!

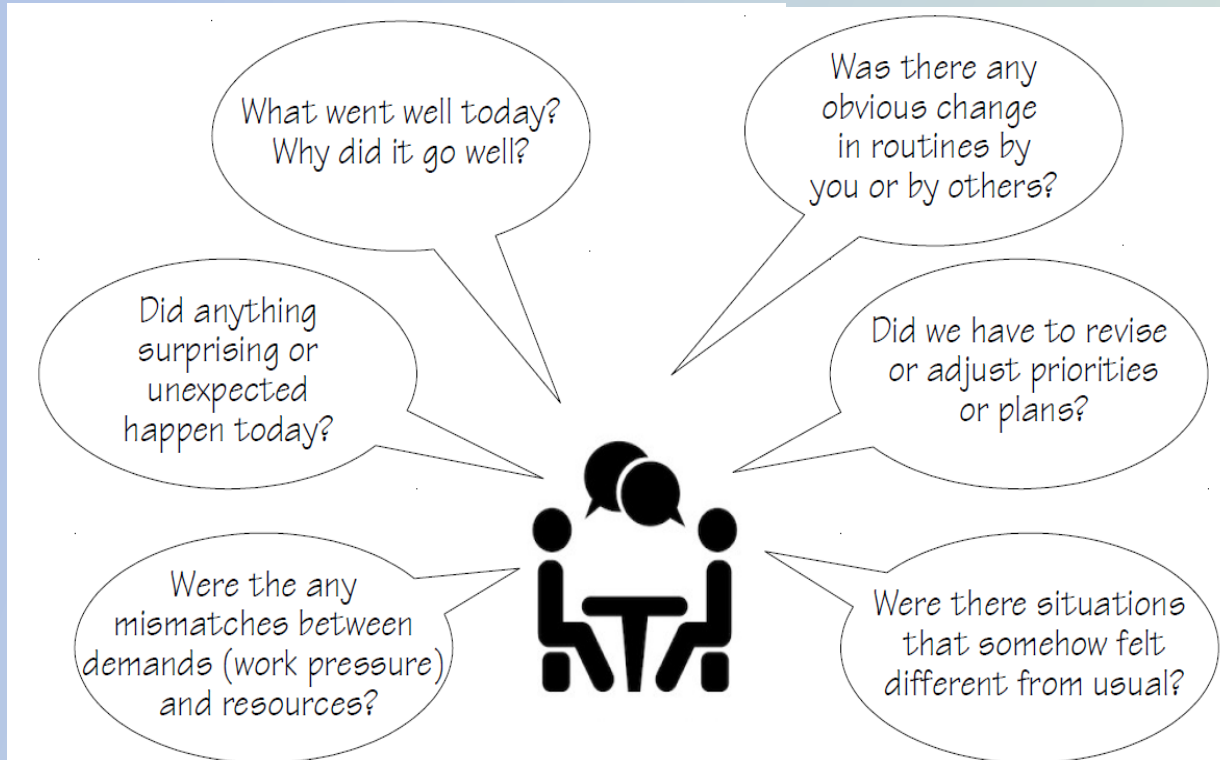


Why?





# Audits or Huddles?



- Aviation – very “safe” in SAFETY I terms
- How “Safe” in SAFETY II terms?
  - (American Airlines?)
- Aviation has very complex Systems
- Susceptible to Swans Black and Grey (NATS)
- Needs continuous learning and improvement; not just periodic Audits
- How do you find out what happened when nothing happened? (Near Misses, Surprises). Ask them!



# ANTICIPATE

## Get your retaliation in first?



### Red Teams

Predict, second guess  
what happens next?



### What if?

Rehearse Responses



### Training the Unconscious competence

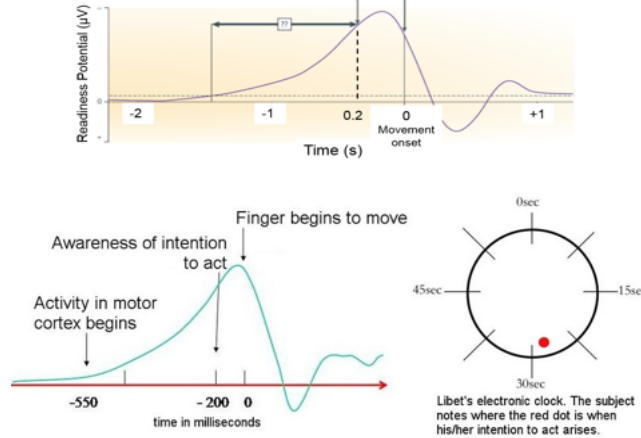
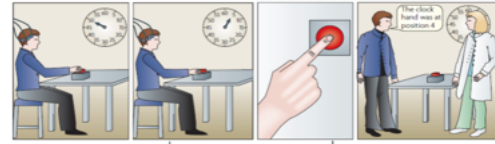
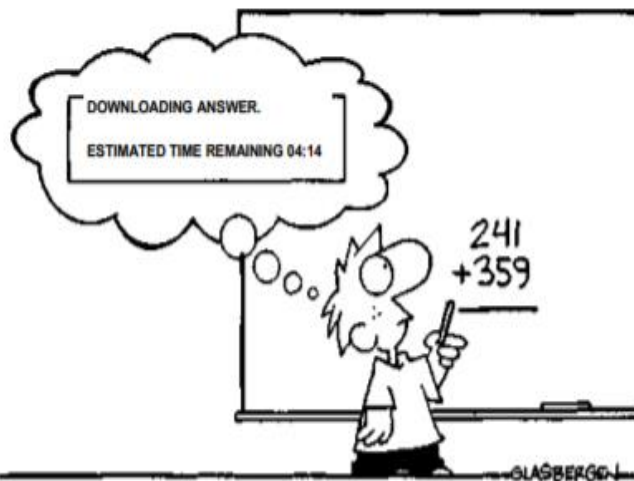
No time to think?

**It's the way the brain has evolved to survive!**



# THINK?

- Libet experiment
- Kahneman Systems
- Choking under pressure
- It's the thinking part of the brain that can get you killed
- Its got to be empowered and instinctive

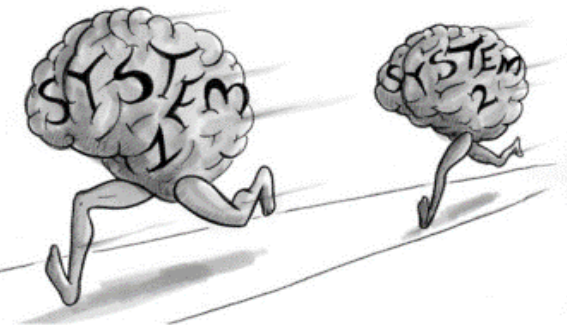


## Libet's Experiments (1970's)

- + He recorded the activity of the brain of subjects while they performed the simple voluntary movement of pressing a key on a computer keyboard.
- + they pressed the key whenever they "felt the urge" to do so (free choice). At the same time, participants had to watch a clock-like counter in the monitor to report the exact time they felt the urge to move.

## Kahneman's "Thinking Fast and Slow"

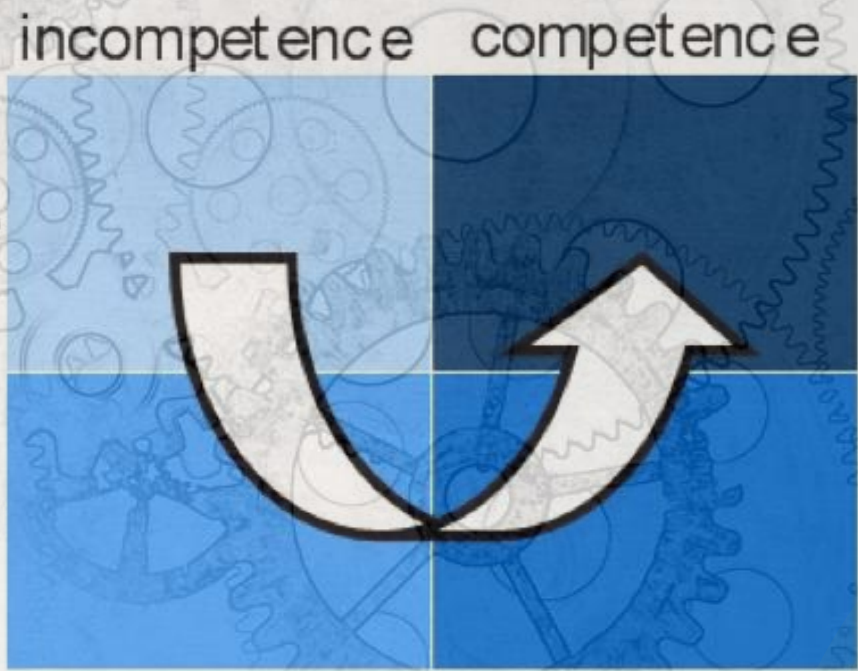
- System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control.
  - System 2 allocates attention to the effortful mental activities that demand it, including complex computations.
- The operations of System 2 are often associated with the subjective experience of agency, choice, and concentration.





# TRAINING ADPTABILITY

Which is the safest place?...



• Courtesy Ralph Mackinnon





Technological realism -

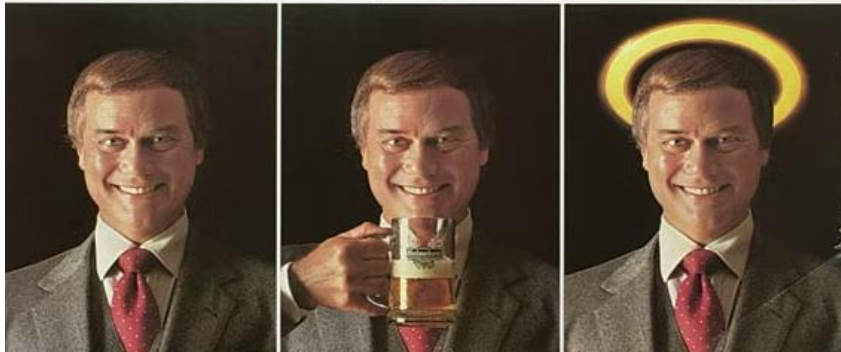
*"Humans are an asset without which proper functioning of modern technological systems would be impossible".*

## ***The importance of instinct, experience, and time for thinking in emergencies.***



- Heineken Training
- Build Resilience and Responsibility
- Responsible Empowerment
- Leadership not Micromanagement
- Team Learning
- Premier League model

**Heineken refreshes the parts other beers cannot reach.**



# Conclusions

- So SAFETY I, II, N, or Differently are all in the same game
- Why do we need different names, functions, tools, data bases, procedures, professional distinctions?
- If its successful and sustainable its almost certainly "SAFE" I or II!
- Make it integral, inherent in everyday work, - not an add on, or optional extra
  
- Operational "Safety" or Operational "Excellence"?
- What's in a name?
  
- RESILIENT SYNESIS?





# Questions?

What happens, when "nothing" happens.

How well do people at the "macro level" (managers, authorities) understand what goes on at the "micro level

How can you make sure that a proposed improvement / change will actually work?

Ask your neighbour?

How do you define how safe you need to be? What is the goal?

How can you determine if developments go in the right direction and with the right speed?



**Thankyou!**





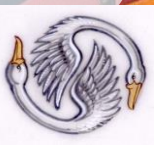
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# Back up Slides

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SAFETY II

6/17/2022





# More Questions?



Safety differently invites a shift from seeing safety as something directly managed to being an outcome of how work is designed, planned, resourced and led. This gives rise to continual asking and learning about what is helping and hindering successful work?

Some will claim, of course, this is our focus; well, to be sure, take a closer look at these four things:

1. How does our organisation's Workplace Health and Safety Management System help people capture these insights, what concrete tools are provided?
2. How does our organisation measure, report and track and communicate this help as work performance data?
3. How does your organisation equip your leaders to engage in these sorts of conversations with the frontline experts?
4. How do leaders respond when presented with the messy reality of work?

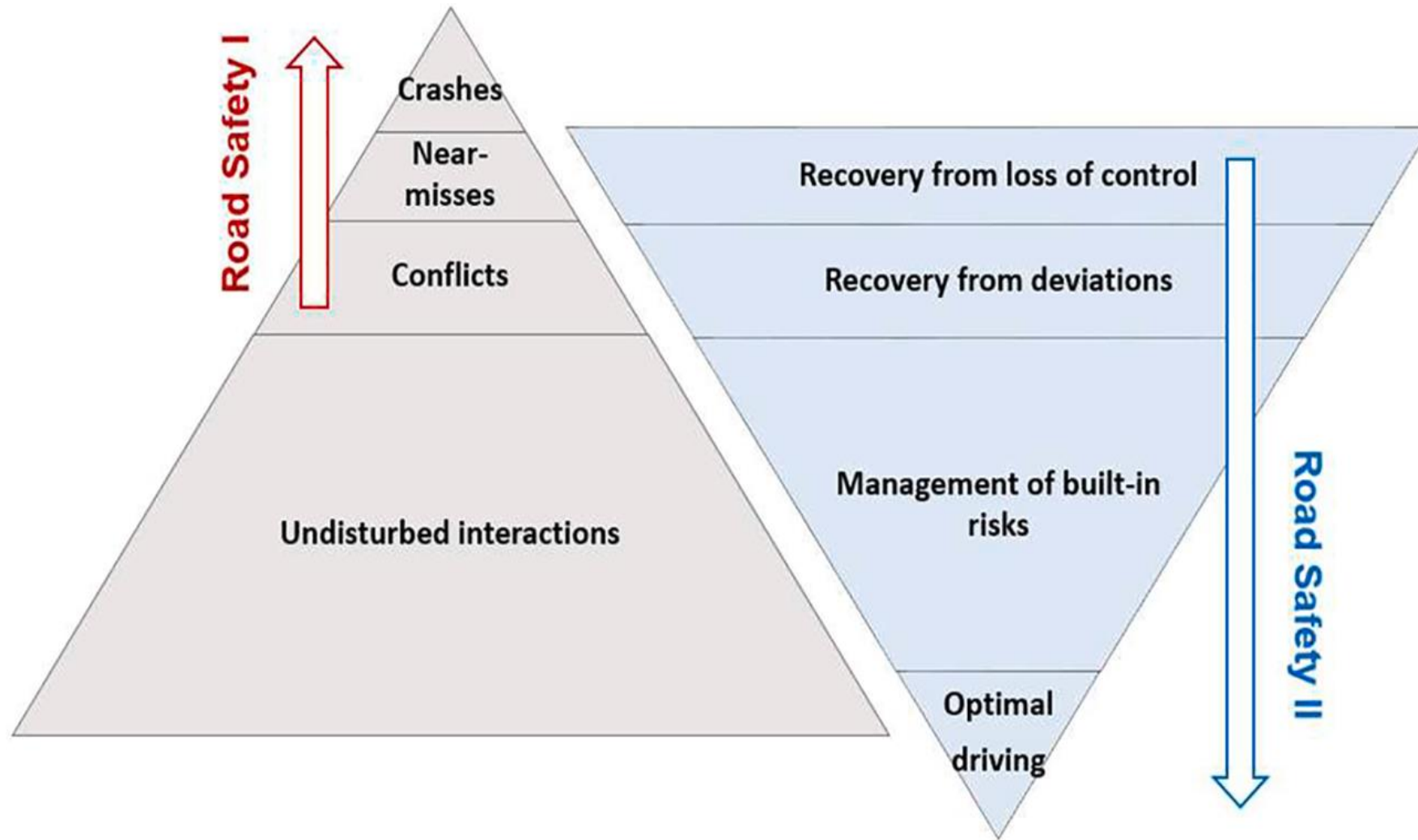
*Marc McLaren - Art of Work*



# People are the solution?

1. Good intent is assumed about people and the decisions they make.
2. The people who undertake the work are viewed as the frontline experts.
3. Leaders take time to discover what is helping and hindering work and, importantly, the solutions people have to improve work.
4. Leaders take time to explore all facets of the solution and quickly quell their preconceived ideas and biases.
5. Trust and decision-making rights are extended to people to test and implement their solutions.
6. The organisation sets a deliberate path to de - layer organisational bureaucracy and works to declutter management systems.
7. The organisation moves from changing people's behaviour to creating an environment that facilitates successful work.
8. Accountability is deeply cherished and grown through exercising autonomy within a clear decision-making framework.
9. Failure is embraced, and learning is seen as paramount.
10. Innovation is celebrated.







# The temporary fix selected in July 2019 was ultimately the best option available

incident key findings



The relevant radar displays were fed at that time by two networks



One switch on one network had been experiencing low levels of packet loss since a configuration change made in late June 2019



Any data lost from the affected switch was still available via the other network



On the morning of 26 July, one switch on the *other* network failed



The fault presented to ATC at affected positions as intermittent loss of some data for ~4-8 seconds at a time, with no apparent pattern



Trail dots continued to be displayed, but the associated Track Data Blocks might disappear for a few seconds



## Incident Response findings



The impact on the controller positions was well scrutinised, but there was less evidence of consideration for other (less significant) systems connected to the same networks



Our framework for assessing risk during a dynamic, evolving incident did not fully guard against ambiguity or gaps





We should be concerned about **productivity**, and do whatever we can to ensure both short-term and long-term productivity goals - but not in isolation.

We should be concerned about **quality**, and do our best to ensure that we achieve the quality we need - but not in isolation.

We should be concerned about **safety**, when things go well as well as when they fail - but not in isolation.

We should be concerned about **reliability** and ensure the necessary reliability of functions in every aspect of system performance - but not in isolation.

*The meaning of synesis is the unification of activities that today's socio-technical systems need to function as intended and desired.*

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