

What makes your ANSP safe?

Two views with profound implications

Dr Steven Shorrock

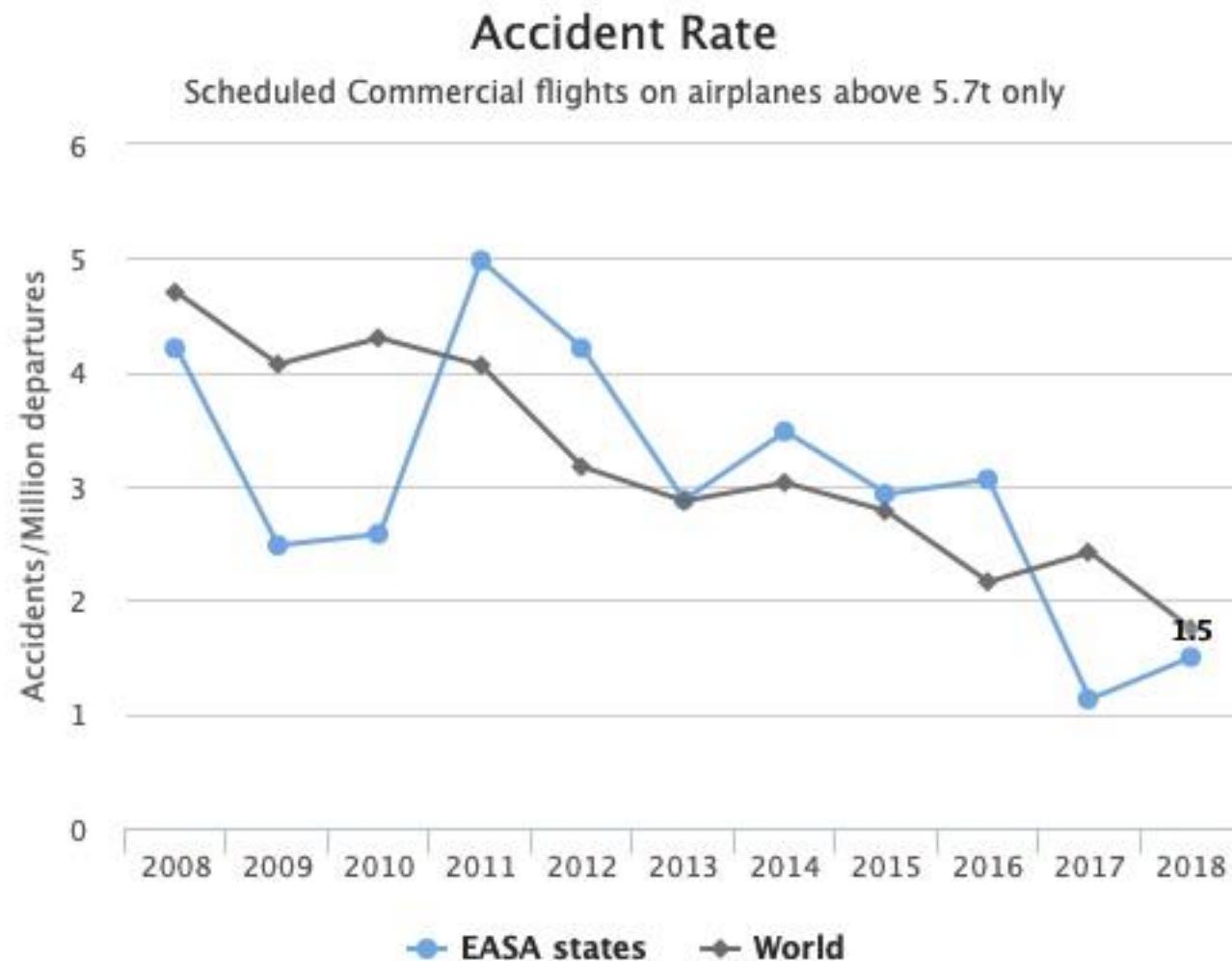
Psychologist | Safety | Human Factors & Ergonomics Specialist

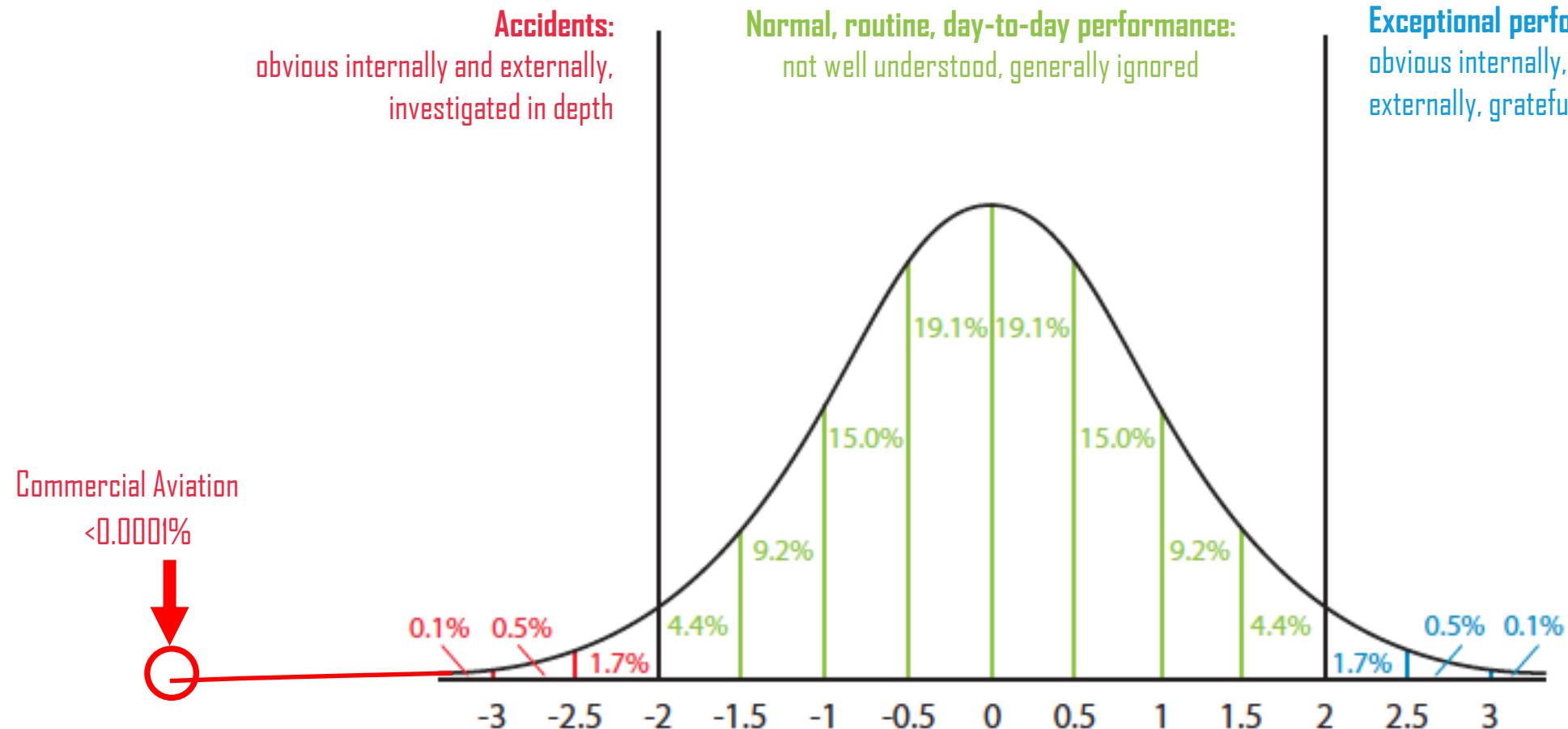
EUROCONTROL NMD SAF Unit

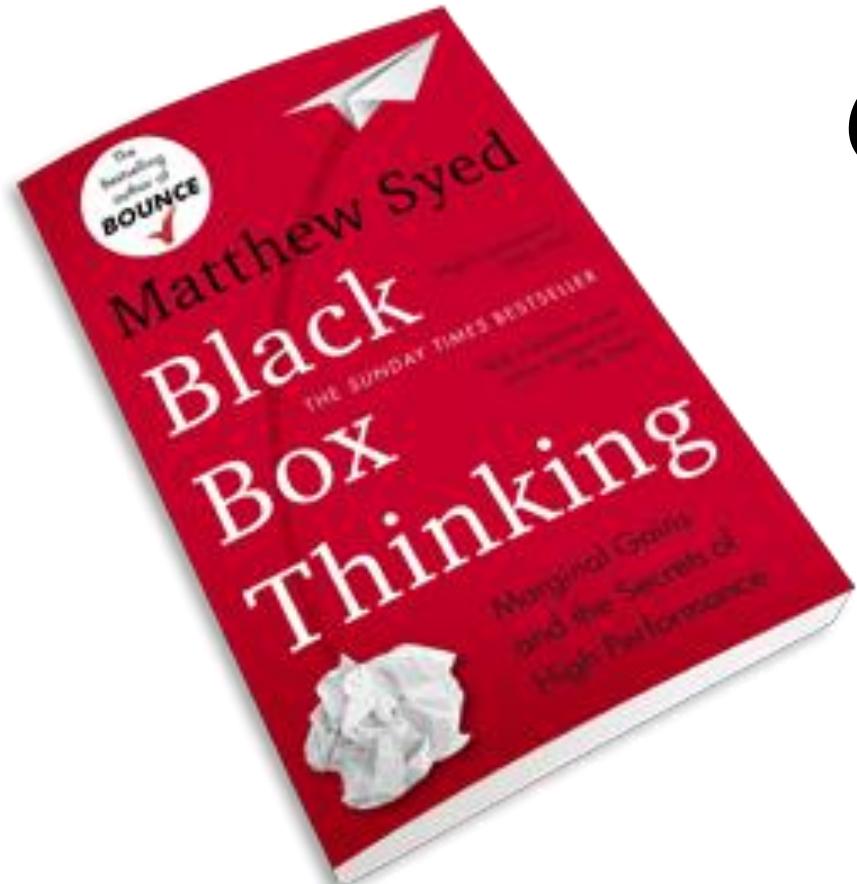
15 May 2019, The CEO's Safety Conference, Copenhagen



DEMAND
AIRSPACE
TECHNOLOGY
REGULATIONS
NORMS
JOB ROLES
STAFFING
MARKET
OPPORTUNITIES
THREATS



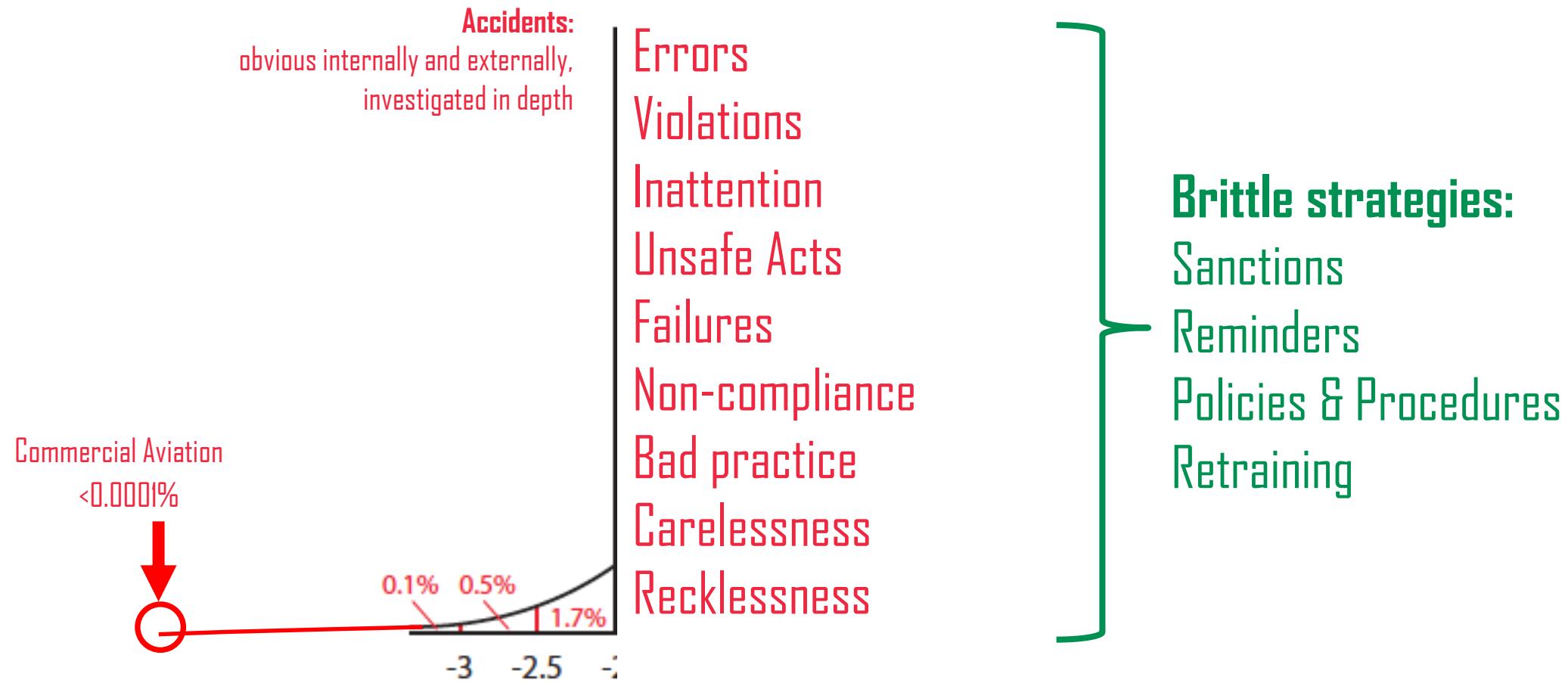




“ Failure is rich in learning opportunities for a simple reason: in many of its guises, it represents a violation of expectation. It is showing us that the world is in some sense different from the way we imagined it to be.

WHY DO THINGS GO WRONG?

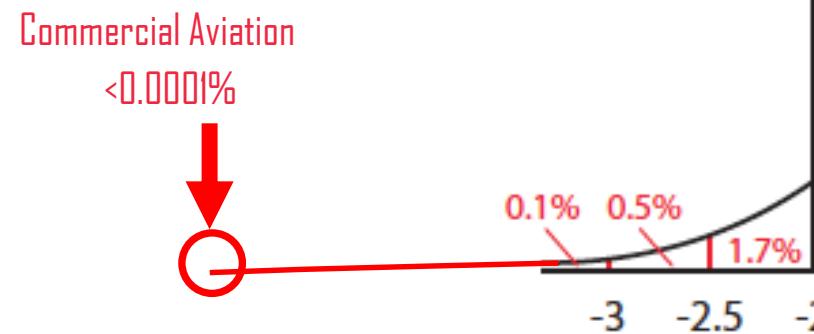
First story: Human Error & Violations



‘First Story’: Human Error & Violations

- Appears quickly after an event
- High personalisation (sharp-end actors)
- Low context
- Low complexity
- High newsworthiness
- Appears easily preventable and fixable (with hindsight)

Accidents:
 obvious internally and externally,
 investigated in depth



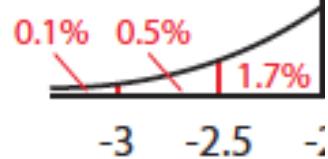
“ ...we explain the unusual event by invoking the usual and proclaiming it to be different, when of course it is not.

Instead, it is the obscure, accidental, and even random concatenation of normal disorders that produces a great event that we assume must have had great causes.



‘Second Story’: System Vulnerabilities

Accidents:
obvious internally and externally,
investigated in depth

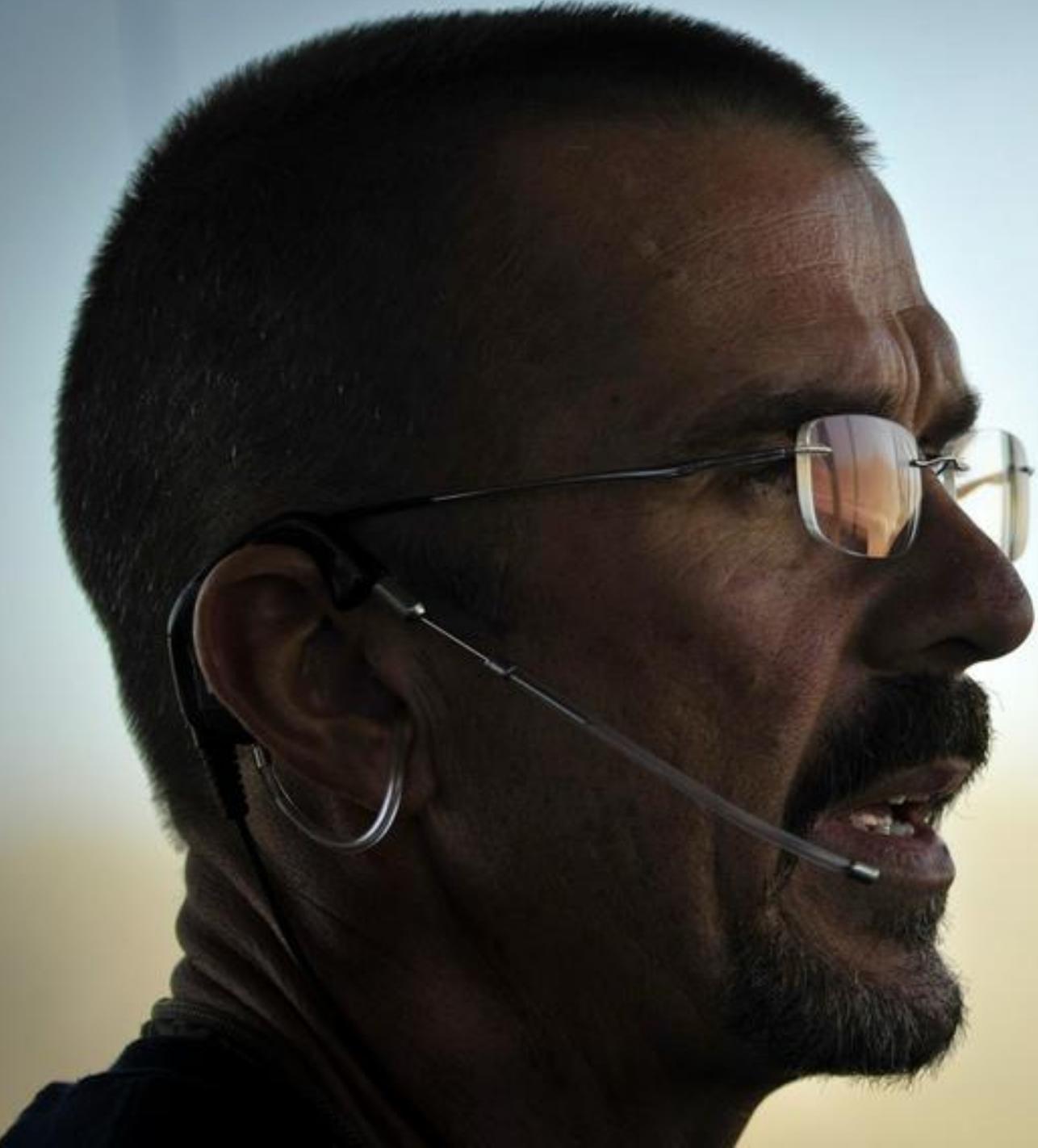


- Goal conflicts
- System not-as-planned
- Production pressures
- New technologies
- Procedural complexity
- Barriers to feedback
- Eroding defences
- Drift
- Adaptations
- Compromises & Trade-offs

It depends

‘Second Story’: System Vulnerabilities

- Emerges slowly after long delay
- Low personalisation
- High context
- High complexity
- Low newsworthiness
- No easy prevention or remediation
 - Event wasn't easy to foresee. But conditions were there to see
 - Changes have unintended consequences
 - Success requires deep expertise



AFTER
THE RUNWAY INCURSION

WHY DO THINGS GO RIGHT?





“ ”

success and failure are derived from the same sources ... exposure to hazards is indivisibly connected to the pursuit of success ... bad events are not separate phenomena that can be eliminated by the use of some managerial or technological tool.



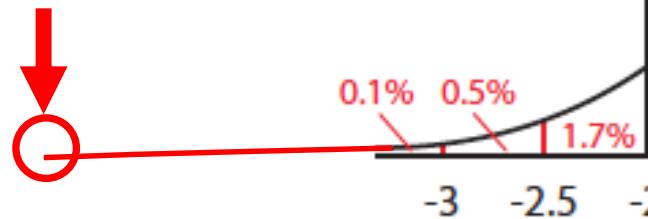
“

Safety is not a separate entity that can be manipulated or achieved in isolation. Rather it is an emergent property of the ways in which the technical, individual, organizational, regulatory, and economic factors ... join together to create the settings in which events—the best ones and the worst ones—occur.

Accidents:
obvious internally and externally,
investigated in depth

Commercial Aviation

<0.0001%



The 'safer' we get, the less
'safety data' we have.

Accidents:
obvious internally and externally,
investigated in depth

Normal, routine, day-to-day performance:
not well understood, generally ignored

Exceptional performance:
obvious internally, hard to see
externally, gratefully accepted

Sources of Safety?

Commercial Aviation
<0.0001%



0.1%

0.5%

1.7%

-3

-2.5

-2

4.4%

9.2%

15.0%

19.1%

19.1%

15.0%

9.2%

4.4%

1.7%

2

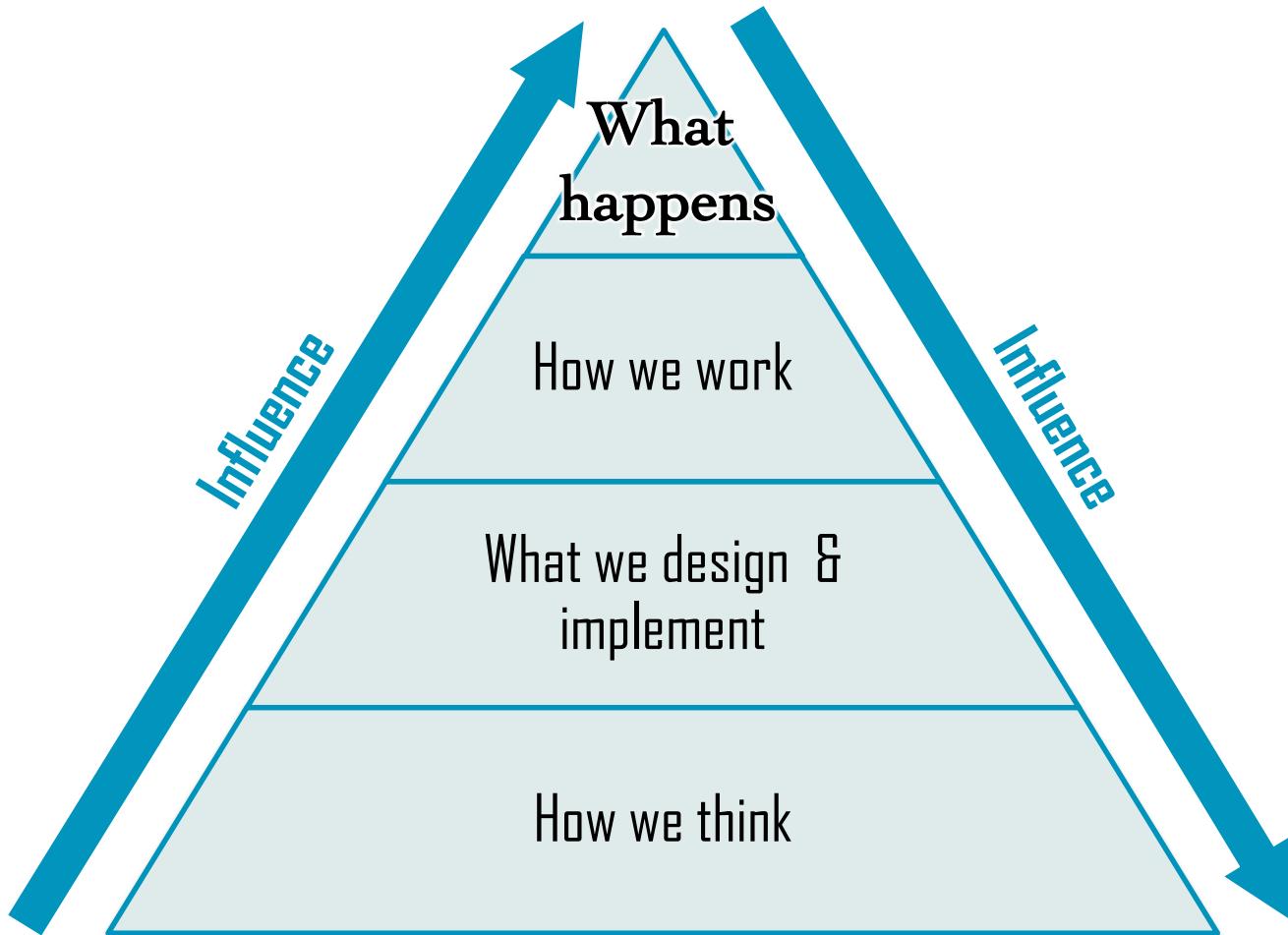
2.5

3

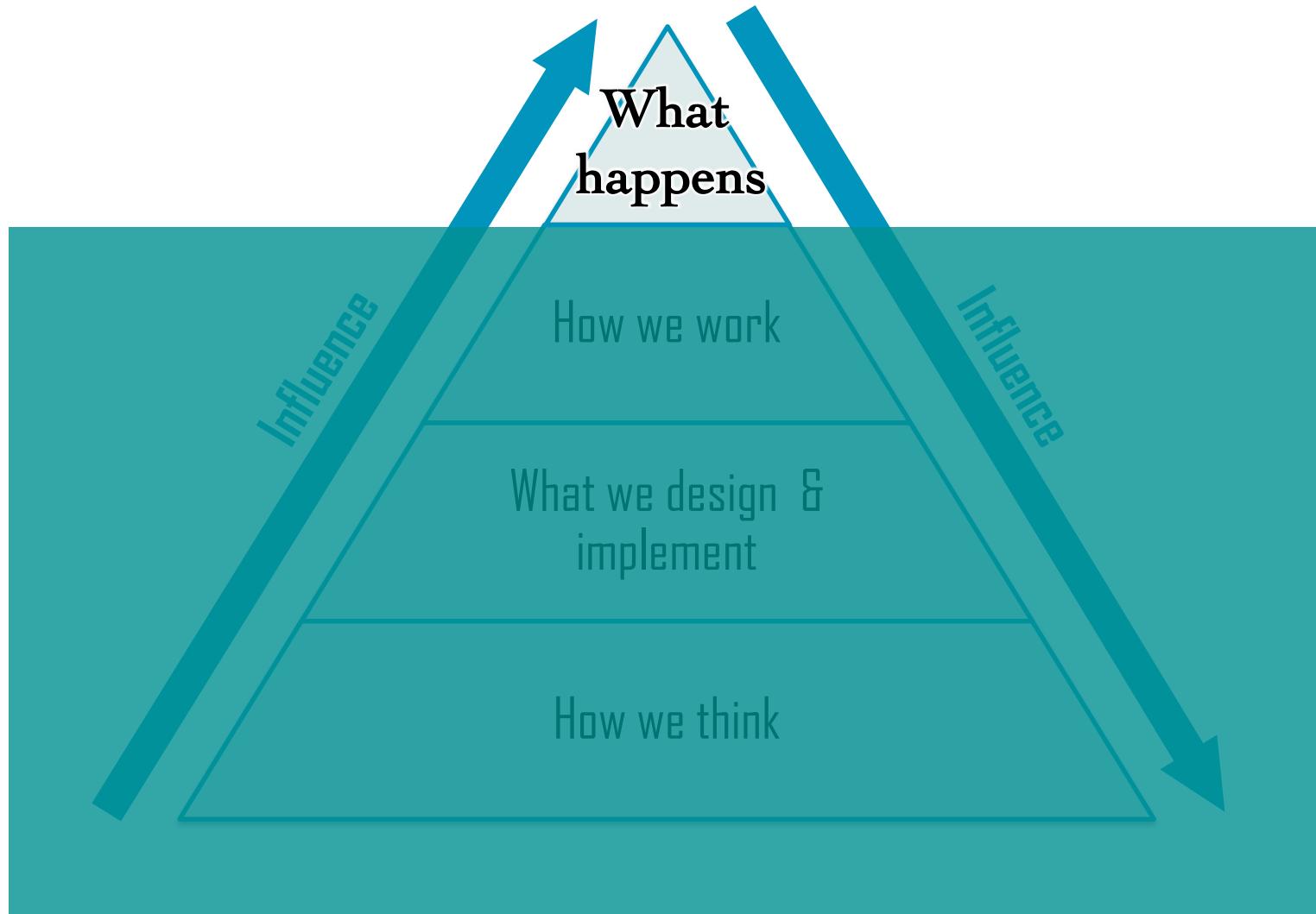
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0.1%

Things go right and wrong for the same sorts of reasons



What do we know about things below the surface?



If you had to explain to a neighbour why your organisation is safe, what would you say?

Adaptive Safety

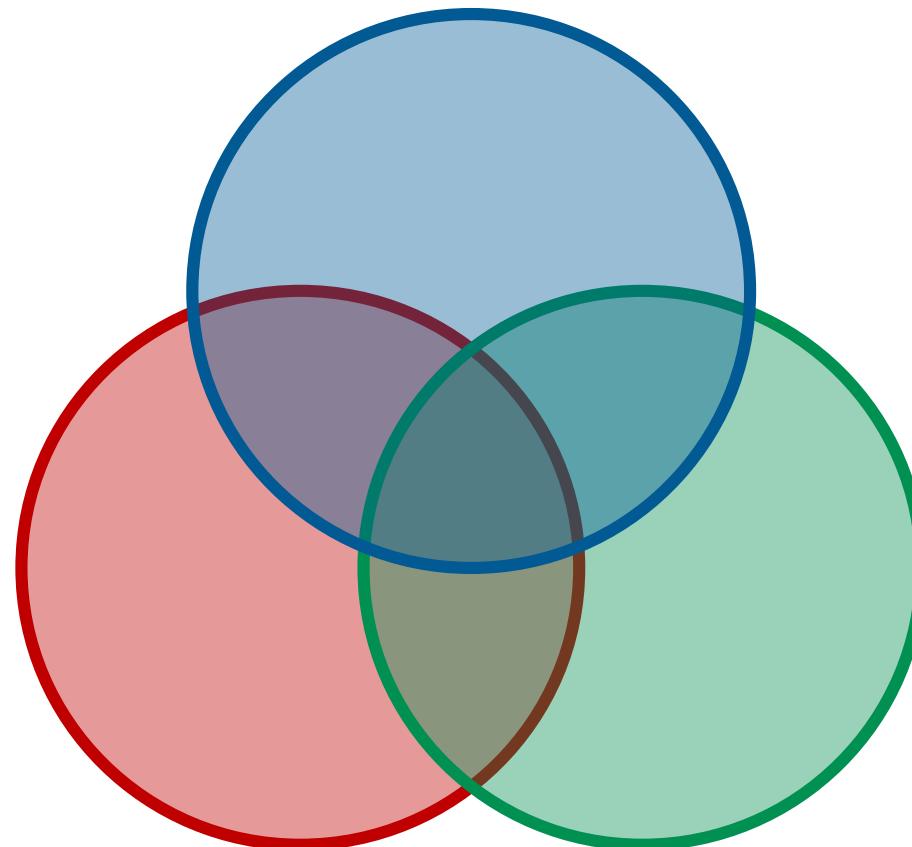
competency | adaptability | teamwork | bottom-up safety management

Designed Safety

procedures | SMS | technology | training | top-down safety management

MIND THE GAP

Work-as-Done



Work-as-Analysed
Work-as-Measured
Work-as-Abstracted
Work-as-Evaluated
Work-as-Simulated

Work-as-Imagined

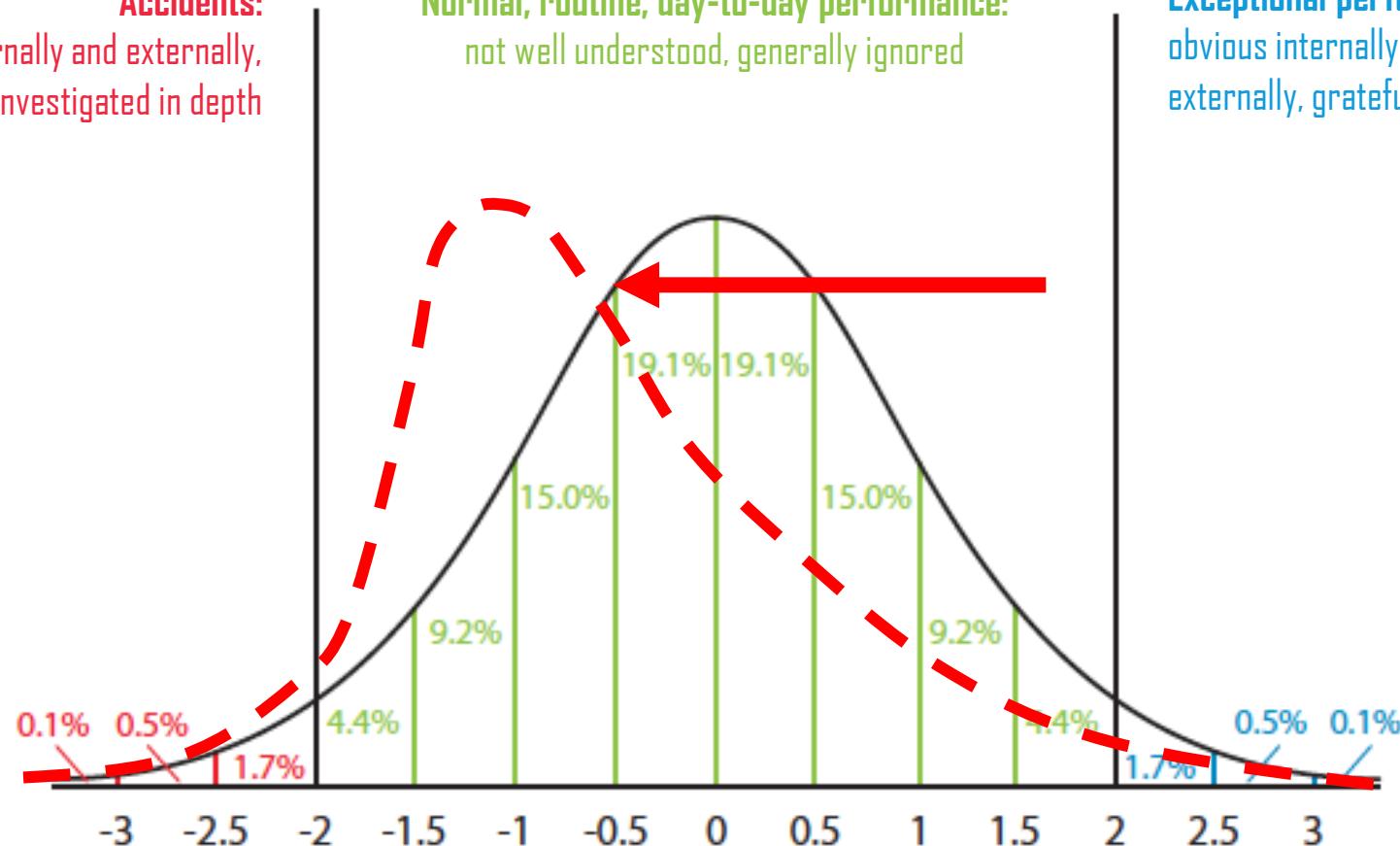
Work-as-Prescribed

Unseen drift in normal performance

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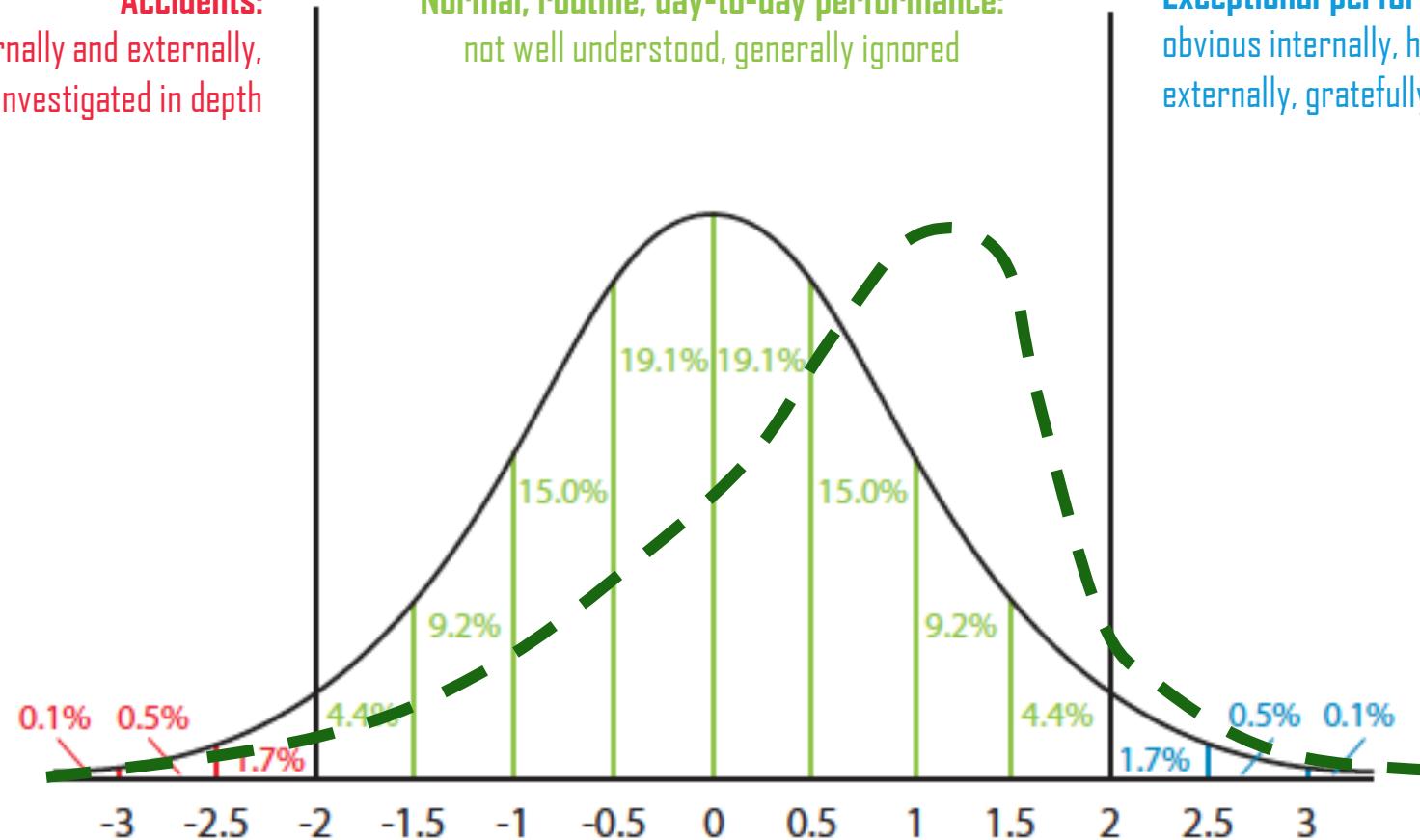


Unseen shift in normal performance

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Seven Friends of Intervention

Acceptance of uncertainty

Competency, expertise & involvement

Research

Listening & observing

Human-centred, activity-focused design

Multiple perspectives & thick descriptions

Systems methods

