

Day 1 - Tuesday 18th April 2023

1630-1800 Session 4: Training Innovation and Insights

*Transforming Recurrent Training Sessions into
Interactive Engagements to Gather Safety Intelligence*



Cengiz Turkoglu

Safety & Accident Investigation Centre



Cengiz Turkoglu

**Senior Lecturer
Course Director MSc Airworthiness
NFLC Compliance Monitoring Manager**



VP Technical



**Former Vice Chairman
Member of the Executive Board**



**Member of the Collaborative Analysis Groups
Human Factors and Commercial Air Transport**



Disclaimer: Unless clearly cited and referenced, all views presented in the following slides are my opinion and not necessarily reflect the views of any of the organisations I am involved in or associated with or work for.





G-NFLB

Cranfield

National Flying
Laboratory Centre (NFLC)



Granfield

Granfield
University

“I’ve never learned anything from anyone who agreed with me”

PLEASE DO CHALLENGE MY ARGUMENTS

**MY PERSONAL OBSERVATION ABOUT THE CURRENT
STATE OF THE COMMERCIAL AIR TRANSPORT INDUSTRY**

DESPITE SOME FANTASTIC TRAINING PROGRAMMES DEVELOPED OVER THE
YEARS AND DECADES AND STILL CURRENTLY DELIVERED TODAY,

NOWADAYS SOME ORGANISATIONS SEEM TO HAVE CONTRACTED A
DEADLY DISEASE!

“SELF-PASED ONLINE/CBT FOR HF/CRM/SMS TRAINING”

WELCOME TO THIS YEAR'S HF/SMS RECURRENT TRAINING

WE HAVE SPENT HUGE AMOUNT OF RESOURCE AND MONEY TO CREATE A NEW SELF-PACED CBT PACKAGE FOR THE HF & SMS RECURRENT TRAINING SO THAT WE CAN DEMONSTRATE COMPLIANCE WITH THE REGULATIONS.

YOU CAN COMPLETE THIS TRAINING AT HOME OR AT WORK WHENEVER YOU ARE NOT BUSY.

AS THERE IS NO INTERACTION WITH A HUMAN BEING DURING THIS TRAINING, YOU NEED TO FIGURE OUT THE SOLUTIONS TO THE CHALLENGES YOU FACE REGULARLY.

BTW, PLEASE DON'T ASK YOUR CHILDREN OR WIFE/HUSBAND TO COMPLETE THIS TRAINING AND TAKE THE TEST AT THE END. EVEN IF YOU DO, YOU SHOULDN'T PAY THEM FOR GOING THROUGH THIS PAIN UNLESS THEY ACHIEVE A PASS MARK!

ONE SIMPLE IDEA TO ADDRESS THREE CHALLENGES



YOU, TRAINERS CAN MAKE A REAL IMPACT!



three separate safety issues
one potential solution

HAZARDS / RISKS / SAFETY ISSUES

➔ **REMINDER - Hazard:** A condition or an object with the potential to cause or contribute to an aircraft incident or accident. (ICAO Annex 19)

HAZARDS	CONTRIBUTING FACTORS	POTENTIAL ROOT CAUSES
Under-reporting	<p>Lack of fear (Just Culture)</p> <p>Ease of reporting</p> <p>Nothing happens, why should I bother?</p> <p>Lack of time, when am I going to report?</p>	<p>Organisational Culture</p> <p>Peer pressure</p> <p>Leadership's attitude</p>
Limited / Lack of monitoring culture (weak signals) in an organisation	<p>Too much driven by compliance</p> <p>To much focus on significant events</p>	<p>Inevitable pressure to maintain approvals</p> <p>Risk perception (Risk Homeostasis)</p>
Ineffective recurrent training due to minimal or lack of interaction (i.e. computer based training becoming norm)	<p>Achieve compliance (following syllabus)</p>	<p>Training seen as a non-productive activity rather than opportunity to capture feedback from employees</p>

THREE KEY CHALLENGES



“Weak Signal Detection”
‘Learning from All Operations’

CONTINUOUS MONITORING OF SAFETY/RISK CULTURE IN THE ORGANISATION

- CONTINUALLY CAPTURE 'LIVED EXPERIENCES' OF FRONTLINE OPERATORS DURING RECURRENT TRAINING SESSIONS
- ENABLE THE PARTICIPANTS TO ANALYSE THEIR OWN STORIES (CRUCIALLY IMPORTANT!) AND USE THE ORGANISATIONAL RISK BEHAVIOUR FRAMEWORK
- FEED THAT SAFETY INTELLIGENCE TO SMS TO ACHIEVE ORGANISATIONAL LEARNING

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**TRANSFORM YOUR RECURRENT TRAINING SESSIONS
TO MONITOR YOUR SAFETY/RISK CULTURE &
ENABLE ORGANISATIONAL LEARNING**

BACKGROUND

THE EUROPEAN PLAN FOR **AVIATION SAFETY**

(EPAS 2022-2026)



Fatigue and quality sleep (SI-3005)

Fatigue is repeatedly identified as one of the most serious challenges within the aviation industry. The signs of fatigue are subtle and will lower human performance in all the known areas of human limitations. Preventing fatigue is dependent on obtaining both a sufficient quantity and quality of sleep.

Human factors competence for regulatory staff (SI-3003)

Competencies are observable and measurable patterns of knowledge, skills and attitude that an individual is expected to demonstrate in relation to required task performance. It is important for regulatory staff to have specific HF competencies to be able to perform their duties. This also provides an added benefit of improving the conversation on safety and human factors between regulatory staff and people at different levels in industry.

Human factors of multiple remote towers (SI-3022) (Amended)

Remote tower operations are increasingly being used, as a means of effectively and efficiently providing ATS at an aerodrome. Multiple remote tower operations are also now being introduced, and the HF associated with this type of work needs thorough consideration.

Impact of culture on human performance (SI-3002)

The pandemic of 2020/2021 made it clearer — organisational culture is an important element in supporting human performance in the workplace. Culture depends on the historical context and the socio-technical environment and economic context in which we live. For example, with the 'economic survival' effect — or when the 'commercial benefit' dictates the running of the organisation too much, leading to a lack of resources; stressful environment; no training policy; too much operational pressure and time pressure; too many subcontracting activities; insufficient maintenance of airport or ATC equipment; etc.

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Currently we are redefining the safety issue to clarify the challenges faced by various stakeholders. The following two slides include the draft text. Please note that this is not finalised as it is going to be discussed during the next HF-CAG meeting in June 2023.

Background (Redefining SI-3002)

Culture has a significant impact on human performance, but this is not generally recognised across the aviation industry. Culture can be defined as a set of values and attitudes that bond the members of a particular group. Culture varies at many levels and depends on the scale (the size of the group of people) that we consider: a continent, a nation, an industry, a company, a profession, a team, a family. It is important to note that we belong to many cultures at the same time. As an international business, aviation is, by definition, multicultural. Different organisational cultures can have the effect that organisations and individuals can make simple mistakes, such as adopting procedures or values and showing behaviours that are inappropriate for the context, with consequences for both safety, costs and productivity. It is crucial therefore to recognise that because people do not perform as islands within an organisation, that human performance is affected by organisational culture. Better understanding of how culture impacts human performance is vital to sustain and further improve organisational performance in terms of the level of safety that the commercial air transport industry has achieved to date.

From a human factors and safety perspective, there is a vast amount of diverse and inconsistent information about how organisational culture affects safety. The aviation industry has evolved the concept of safety culture. First described in the nuclear industry it has gained considerable traction in aviation. While literature continues to discuss whether safety culture actually exists, the industry has moved on and is now focussing on how can it be measured, how it can be assessed and how a positive safety culture can be developed as a result of an assessment. Becoming aware of how safety thinking permeates an organisational culture then raises the challenge of how a positive safety culture might be sustained.

Some examples of specific issues related to culture can be summarised as follows:

- As part of an SMS, organisations are expected to conduct safety culture surveys regularly (annually/bi-annually). In many cases, the methodology used for developing and conducting such surveys have very limited utility to better understand the culture in the organisation. For example, they sometimes purely focus on collecting quantitative data but fail to capture the 'lived experiences' of frontline operators (including their supervisors/line managers) which can be a valuable insight into the operational risk scenarios they face.
- While it is accepted that safety is delivered at the frontline, operational level many surveys focus purely on data collected from frontline operators and line management. This path fails to explore the culture of the boardroom and how senior executives create the need for safety and reflect its importance throughout an organisation.
- While constructs such as 'Just Culture' make perfect sense in theory, in practice their implementation can be problematic for a variety of reasons. Ultimately the organisations' aim should more focus on achieving organisational learning.
- Sometimes the discussions around assessment of safety culture fail to capture how operational risk scenarios are identified, assessed, mitigated, communicated and monitored at all levels in the organisation. 'Risk Culture' which is heavily studied on some of other sectors can/should be considered as one of the key dimensions of 'Safety Culture'.

Background (Redefining SI-3002)

The picture from the regulatory perspective is equally nebulous. Regulation accepts the existence of organisational culture and goes some way to trying to reinforce it but realistically, from an aviation standards/regulations point of view, the following factual observations can be made.

- The term 'organisational culture' appears in ICAO Annex 19 Edition 1 but no mention of 'safety culture' or 'just culture' in this edition.
- The term 'positive safety culture' appears in ICAO Annex 19 Edition 2 but no mention of the term 'just culture'.
- The terms 'organisational culture', 'safety culture' and 'just culture' appear in various editions of the ICAO Doc. 9859 Safety Management Manual but no mention of the term 'just culture' in the latest edition (the 4th Edition) of the ICAO Doc 9859.
- The main EU reporting regulation 376/2014 includes the term 'just culture' several times including a definition.
- The use of the terms 'safety culture' and 'just culture' in various domain specific regulations (EU OPS, ATM, Aerodromes, Continuing Airworthiness) varies. While some of the certification specifications, AMC's/GM's related to certain domains cover the subject, others do not even mention these terms.
- Some of the previous versions of the EU ATM regulations related to performance scheme for air navigation services and network functions required the measurement of 'just culture'.

Some may argue that trying to regulate topics such as culture is impossible or meaningless while others strongly believe that using such terms like 'just culture' in enforceable regulations is the only way to make progress in this challenging area of developing a positive safety culture.

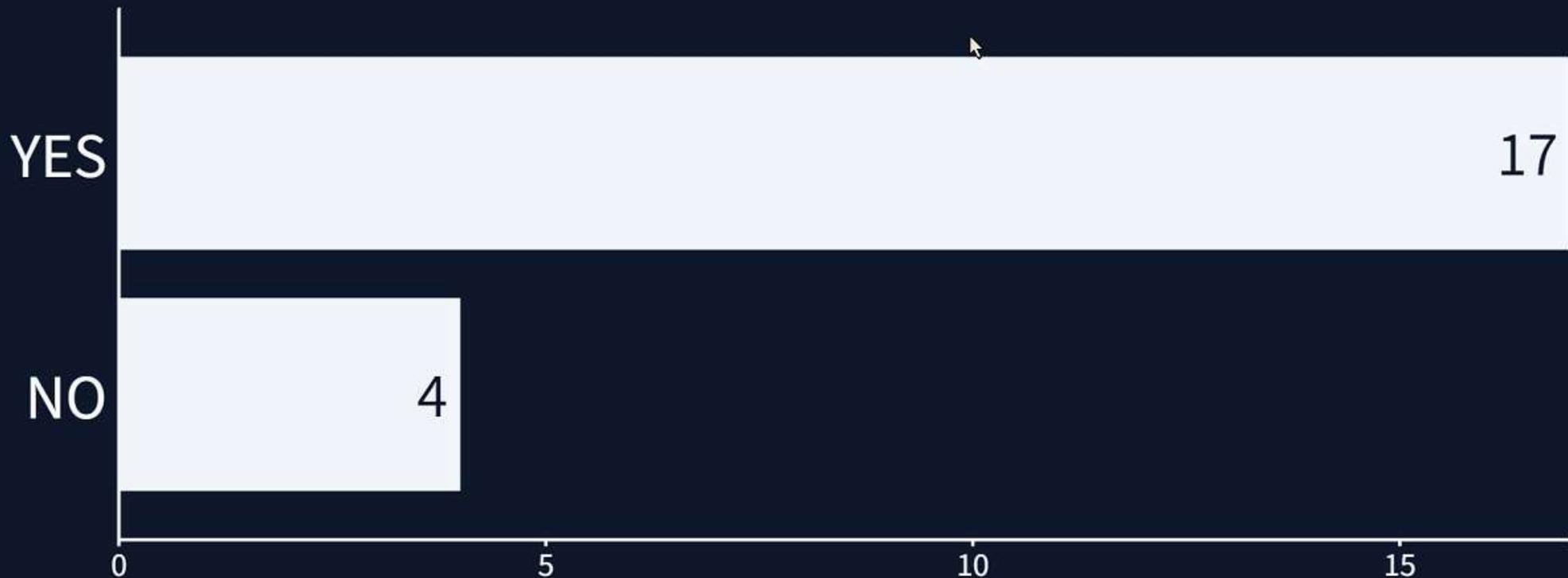
All of these observations clearly demonstrate a big challenge from regulatory, safety and human factors perspectives; therefore this safety issue needs to be considered for a further study and careful in-depth analysis. Because the fundamental challenge for the leadership, senior executives, middle managers and the frontline operators working in all stakeholders in the industry is to better understand how organisational and safety culture influence their performance but also how they can influence the culture in their organisation to achieve a positive change.

SOME FUNDAMENTAL QUESTIONS?

WHAT IS CULTURE/SAFETY CULTURE?

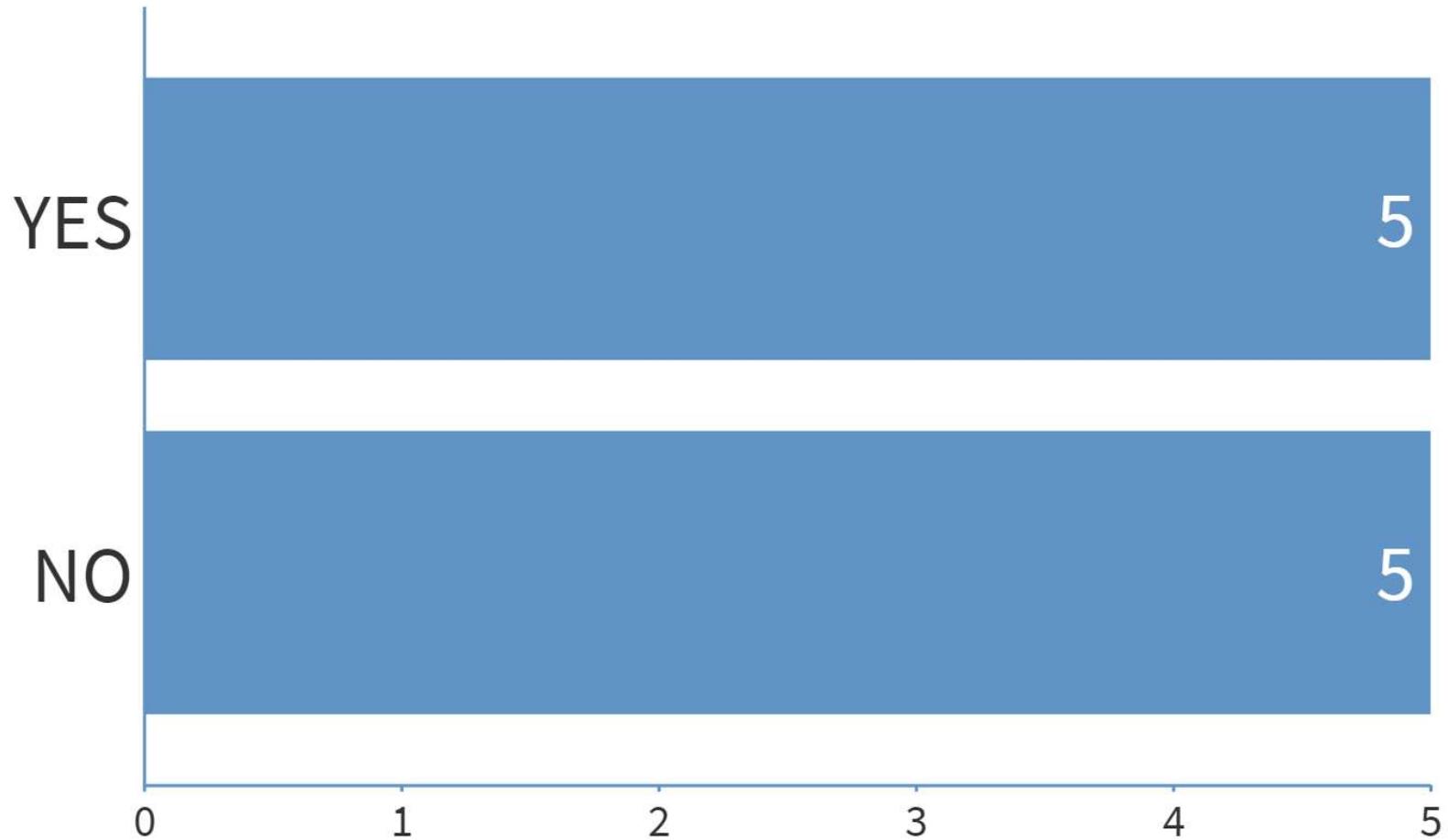
CAN WE MEASURE/ASSESS IT?

Do you think we can measure 'safety culture'?



Can 'CULTURE' be measured?

Respond at PollEv.com/ciehf



SAFETY CULTURE DEFINITION



**Safety culture and safety climate
definitions suitable for a regulator**
A systematic literature review

Trang Vu and Helen De Cieri

8 April 2014

Research report 0414-060-R2C

SAFETY CULTURE DEFINITION

The review identified a total of **108 definitions of safety culture, safety climate and related constructs**. Of these definitions, **51** are original **safety culture definitions** and **30** are original **safety climate definitions**.

SAFETY CULTURE DEFINITION



Author(s)	Year	Publication type	Definition
			policy, procedures and management actions (what the organisation is); and 2. the collective individual and work group responses (their values, beliefs and behaviours). (pp.5-6).
Federal Aviation Administration, Department of Transportation (US)	2007	Government order	The personal dedication and accountability of individuals engaged in an activity that has a bearing on the safe provision of air traffic services (p.A-3).
Federal Aviation Administration, Department of Transportation (US)	2008	Report	A safety culture is a pervasive emphasis on safety that promotes an inherently questioning attitude, resistance to complacency, a commitment to excellence, and the fostering of personal accountability and corporate self-regulation in safety matters (p.1).

SIMPLER / PRAGMATIC DEFINITIONS

“The way we do things around here”

**“How people behave in relation to safety and risk
when no one is watching”** (ICAO SMM Edition 4)

A close-up portrait of Professor Emeritus Geert Hofstede, an elderly man with glasses, looking slightly to the right. He is wearing a dark suit jacket over a light-colored shirt. The background is blurred, showing what appears to be a bookshelf.

CULTURE

'the unwritten rules
of the **social** game'

Professor Emeritus Geert Hofstede

Commercial Air Transport: 'A Complex **Socio-technical** System'

WHY RISK

WHY CULTURE

WHY RISK CULTURE

W H Y R I S K ?



MANAGING SAFETY = MANAGING RISK

"Safety is increasingly viewed as the management of risk." (ICAO Doc. 9422)

RISK = SEVERITY X PROBABILITY

Safety risk = The predicted probability and severity of the consequences or outcomes of a hazard. (ICAO Doc. 9859 4th Ed.)

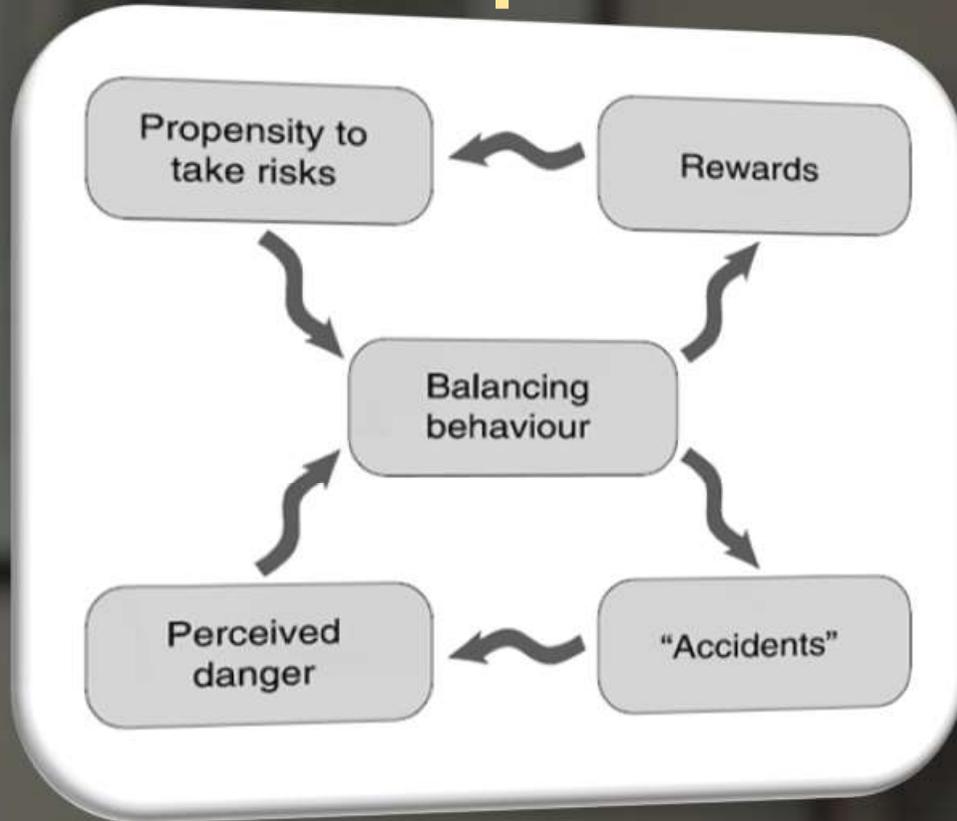
RISK = UNCERTAINTY & OPPORTUNITY

By definition, Risk involves uncertainty but also opportunity.



www.riskculture.org

“Risk management: it’s not rocket science.
It’s **more complicated** than that.”



Risk management: cutting the CRAP

Psychosis: noun - a severe mental disorder in which contact with reality is lost or highly distorted.

I was recently invited to address a conference of psychiatrists on the subject of risk. They, like the rest of the medical profession, practice defensively for fear of litigation, and labour under incessant demands for the assessment of every imaginable risk, however small. I offered for their consideration a new mental illness that I called obsessive risk assessment disorder. One of them proposed that the disorder I described was sufficiently serious to merit the label psychosis – hence

Compulsive Risk Assessment Psychosis, or CRAP. There is a lot of it about, and numbers of new cases are growing rapidly.

<http://john-adams.co.uk/wp-content/uploads/2008/09/crap-for-irm21.pdf>

John Adams
Professor Emeritus, University College London

RISK = SEVERITY X LIKELIHOOD

Safety risk is the projected likelihood and severity of the consequences or outcomes from an existing hazard or situation.

Source: ICAO SMM



R

I

S

K



‘acceptable level of safety’

‘perception of risk’

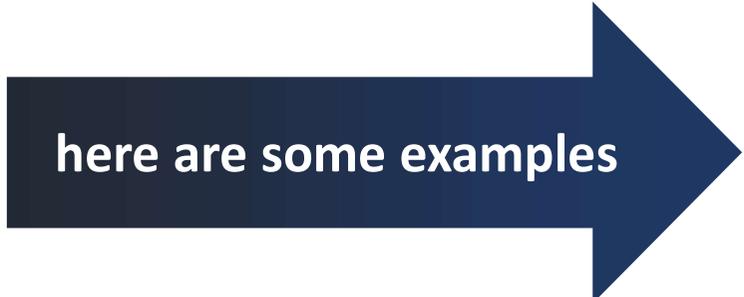
‘risk attitude’

‘risk tolerability’

‘risk appetite’

inevitably subjective

here are some examples





arts-wallpapers.com
-not for sale



16- कार रक

NHK WORLD

BEFORE



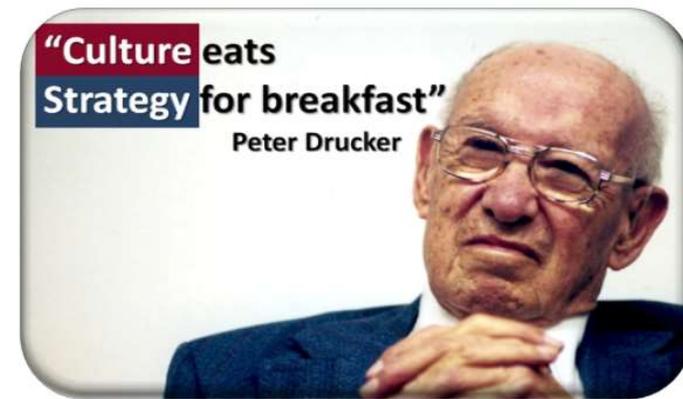
AFTER



NHK WORLD



W H Y C U L T U R E ?



The relationship between culture and safety is a complex one but many would argue and accept that culture is an important enabler for managing safety and risk.

**CULTURE IS AN IMPORTANT ENABLER
FOR MANAGING SAFETY/RISK**

Corporate Culture - Key to Success

CULTURE:
*“Admittedly
difficult to define”*

“CULTURE: *You
know it when
you see it*



Culture – “Definitionally Illusive”

YOU KNOW IT WHEN YOU SEE IT



W H Y R I S K C U L T U R E ?

“Warm-blooded, passionate, inherently social beings though we think we are, humans are presented in this context as hedonic calculators calmly seeking to pursue private interests. We are said to be risk-averse, but, alas, so inefficient in handling information that we are unintentional risk-takers; basically we are fools.”

Dame Mary Douglas



“Homo prudens—zero-risk man. He personifies prudence, rationality and responsibility. Zero-risk man is a figment of the imagination of the safety profession. Homo prudens is but one aspect of the human character. Homo aleatorius—dice man, gambling man, risk-taking man—also lurks within every one of us.”

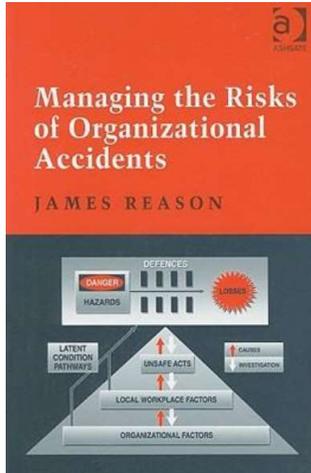
John Adams

Risk is a social and a subjective construct; therefore common understanding of risk and communication of risk across different levels in organisations is vital for its effective management.

COMMON UNDERSTANDING OF RISK AND
COMMUNICATION OF RISK ACROSS DIFFERENT
LEVELS IS **VITAL** FOR ITS EFFECTIVE MANAGEMENT

REASON – AN INFORMED SAFETY CULTURE (1997)

1
9
9
7



just culture

reporting culture

learning culture

flexible culture



Prof. J Reason

2016

risk culture?

REASON DISCUSSED 'RISK CULTURE' IN 2006

Management of Human Factors Risk in Safety-Critical Industries
Royal Aeronautical Society, 11th May 2006

Human Factors Risk Culture

James Reason
Emeritus Professor
University of Manchester

'Risk Culture' first coined in 1995 (Post Chernobyl)

CONFERENCE PROCEEDINGS
of the INTERNATIONAL TOPICAL MEETING on

SAFETY
CULTURE
IN NUCLEAR INSTALLATIONS



ANS-ALS

24 - 28 April 1995 VIENNA AUSTRIA

ORGANISED IN COOPERATION WITH



'Risk Culture' first coined in 1995 (Post Chernobyl)

RISK CULTURE: AN OUTGROWTH OF SAFETY CULTURE

V.JOKSIMOVICH

D.D.ORVIS

Accident Prevention Group

San Diego, California

United States of America

'Risk Culture' first coined in 1995 (Post Chernobyl)

the Human Dimension, IAEA Safety Culture Initiatives, a U.S. Utility Safety Culture and Integrated Risk Management. It recognizes that the safety culture in the U.S. nuclear utility settings has been achieved in many instances with costly solutions. The U.S. National Energy Act, signed into law by President Bush, began deregulation of the electric utility industry creating a competitive climate heretofore never known and in particular affecting those utilities with large imbedded costs from nuclear generation units. The authors perceive that there are three major ingredients or a tripod for a survival strategy for the nuclear power plant option in the U.S. as a part of larger energy security strategy: (1) Integrated rather than fragmented Risk Management by nuclear utilities; (2) Risk Based Regulation by the Nuclear Regulatory Commission to free up resources for more productive uses in nuclear safety regulation, and (3) Due emphasis to be placed in Operational Risk Management on controlling swings in the Core Damage Frequency with time by virtue of building an effective operational risk model. The paper makes an attempt to raise awareness regarding the human dimension component in the operational risk model. It concludes that the proposed tripod is achievable only if accompanied by a swift shift to a risk culture which is introduced in a conceptual form.

COMPETING GOALS

COMPETING GOALS



ON-TIME PERFORMANCE



COST



SAFETY

COMPETING GOALS



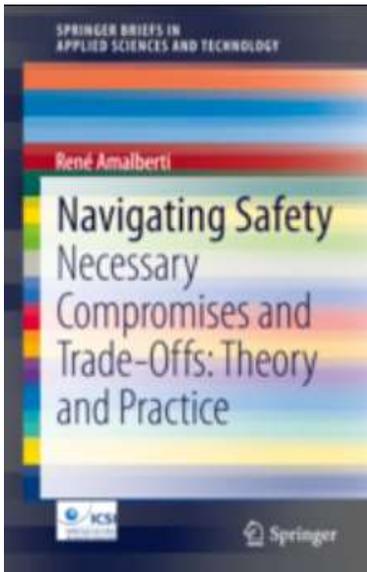
PARADOXES & DILEMMAS

CAN SAFETY & JUSTICE CO-EXIST?

criminalisation of accidents,
and the **litigation culture** in society, ...



does 'compensation culture' lead to ... 'risk blindness' in society?



“Safety is a paradox; people demand safety once they have taken risks.”

René Amalberti

**EU FUTURE SKY SAFETY PROJECT
EU PILOT CULTURE STUDY (2016)**

7239 PILOTS

(RUMSFELD'S) KNOWN UNKNOWNNS

FUTURE SKY SAFETY SURVEY (2016)

'EUROPEAN PILOTS' PERCEPTION OF SAFETY CULTURE'

RISK HANDLING

"I have to take risks that make me feel uncomfortable about safety"

7.39% of 7239 pilots
(over 500 pilots)

Agreed or Strongly Agreed



Neither Agree Nor Disagree

Disagree or Strongly Disagree

HOWEVER THE SURVEY DIDN'T CAPTURE THEIR EXPERIENCES. WE NEED TO UNDERSTAND WHAT THOSE RISKS ARE TO BE ABLE TO MITIGATE THEM BETTER.

(RUMSFELD'S) KNOWN UNKNOWNNS

FUTURE SKY SAFETY SURVEY (2016)

'EUROPEAN PILOTS' PERCEPTION OF SAFETY CULTURE'

RISK HANDLING

"We often have to deviate from procedures for safety reasons"

5.55% of 7239 pilots
(over 360 pilots)

Agreed or Strongly Agreed

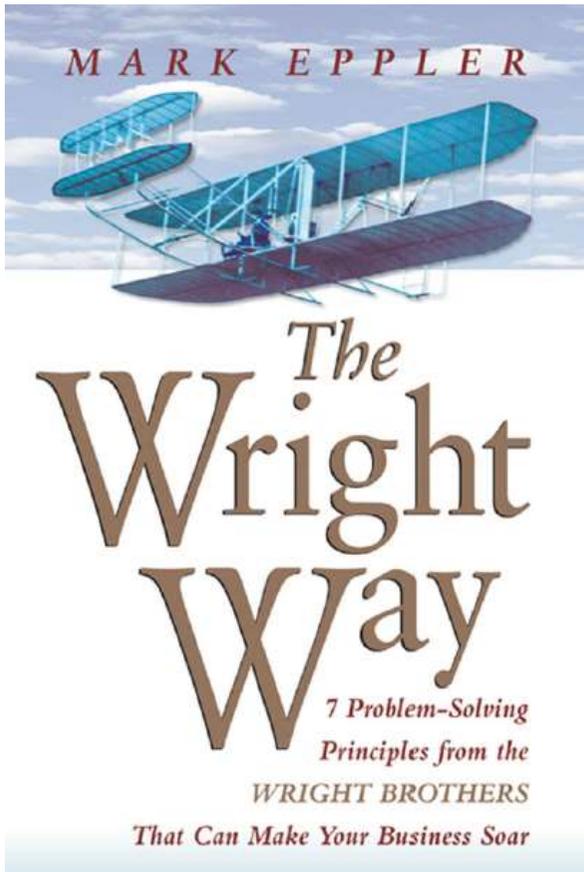


Neither Agree Nor Disagree

Disagree or Strongly Disagree

HOWEVER THE SURVEY DIDN'T CAPTURE THEIR EXPERIENCES. WE NEED TO UNDERSTAND WHAT THOSE DEVIATIONS ARE TO ADDRESS THEM

MAIN ARGUMENT



In 1900, Wilbur wrote to his father,
“Carelessness & overconfidence,” he
said, “are usually **more dangerous than**
deliberately accepted risks.”

over a century later,

I argue differently

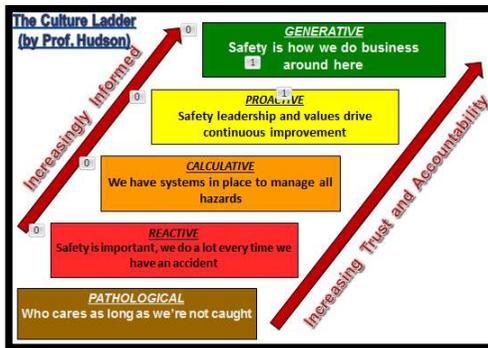
THE HUMAN ELEMENT IS THE KEY TO MANAGING RISK

www.riskculture.org



Everyday, **difficult risk decisions** have to be made by **pilots, engineers, technicians & their managers** due to various **factors encouraging them to accept some level of risk** in their operational environment. This study does not aim to apportion blame to frontline operators and it aims to identify those factors which encourage risk-taking behaviour and enable **proactive implementation of a 'Just Culture'** in organisations.

addressing human reliability and particularly **individuals' attitude towards** risk is much more **challenging** than preventing errors therefore I believe **factors driving/encouraging** professionals **to accept certain risks** pose more **significant threat** to flight safety.



IF

managing safety = managing risk

SHOULDN'T WE ALSO CONSIDER

RISK CULTURE?

HOW RISK IS PERCEIVED ACROSS THE ORGANISATION AND

HOW RISK DECISIONS ARE MADE AT DIFFERENT LEVELS?

-
- 2016** ○ **1st RISK CULTURE SURVEY IN CAT INDUSTRY**
 - 2017** ○ **2nd RISK CULTURE SURVEY IN CAT INDUSTRY**
 - 2018** ○ **DEVELOPMENT OF ORGANISATIONAL RISK BEHAVIOUR FRAMEWORK**
 - 2021** ○ **COLLABORATIVE STUDY (BALPA, CRANFIELD, COGNITIVE EDGE) VALIDATION OF FRAMEWORK**



2016 ● 1st RISK CULTURE SURVEY IN CAT INDUSTRY

2017 ● 2nd RISK CULTURE SURVEY IN CAT INDUSTRY

2018 ● DEVELOPMENT OF ORGANISATIONAL RISK
BEHAVIOUR FRAMEWORK

2021 ● COLLABORATIVE STUDY (BALPA, CRANFIELD,
COGNITIVE EDGE) VALIDATION OF FRAMEWORK

INDUSTRY-WIDE SURVEYS IN 2016 & 2017



1 WELCOME & THANK YOU FOR YOUR PARTICIPATION!



YOUR EXPERIENCE MATTERS!



.....

www.riskculture.org
email@riskculture.org

FOCUS ON TWO FUNDAMENTAL QUESTIONS & SUB-QUESTIONS

- | | |
|---|--|
| <p>1 A scenario & decision on most significant 'accepted/acceptable risk'</p> | <p>1. Risk Decision Making
Individual vs Organisational</p> |
| <p>2 A scenario & decision on most significant 'unacceptable/rejected risk'</p> | <p>2. Factors encouraging / discouraging people to take such safety risks.</p> |

OPERATIONAL TARGETS & RISK TAKING

2016

Operational targets (such as 'on-time performance', 'availability', 'technical dispatch reliability'), can encourage pilots, engineers and their managers to take **SIGNIFICANT** risks potentially impacting on flight safety.

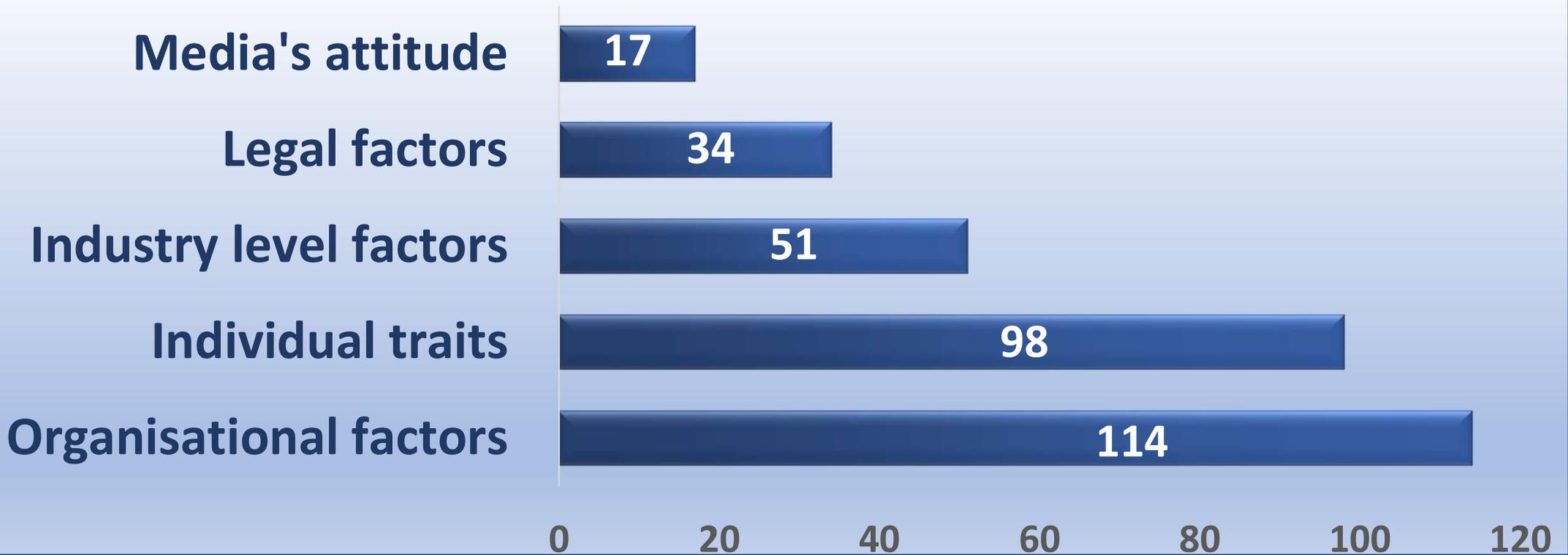
2017

Operational targets (such as 'on-time performance', 'availability', 'technical dispatch reliability'), can encourage **"EXCESSIVE" / "UNNECESSARY"** risk taking behaviour impacting on flight safety.

You may not necessarily agree with this statement. For example, some people argue that nowadays, particularly professionals (pilots & engineers/technicians) in large organisations do not have much discretion any more and considering the strict rules and regulations, they really cannot take any risks. However the counter argument is that there will always be circumstances that a pilot or engineer/technician must use judgement based on his/her technical knowledge and perception of risk before making a decision such as releasing or accepting an aircraft to service.

	2016 (n=165)		2017 (n=123)	
Strongly Disagree / Disagree	30	18%	16	13%
Neither Agree Nor Disagree	33	20%	20	16%
Strongly Agree / Agree	102	62%	87	71%

FACTORS ENCOURAGING RISK TAKING



Organisational factors i.e. safety culture, leadership's attitude towards risk

Individual traits i.e. 'can do' attitude or 'thrill seeking'

Industry level factors i.e. policies, growth in the industry, competition

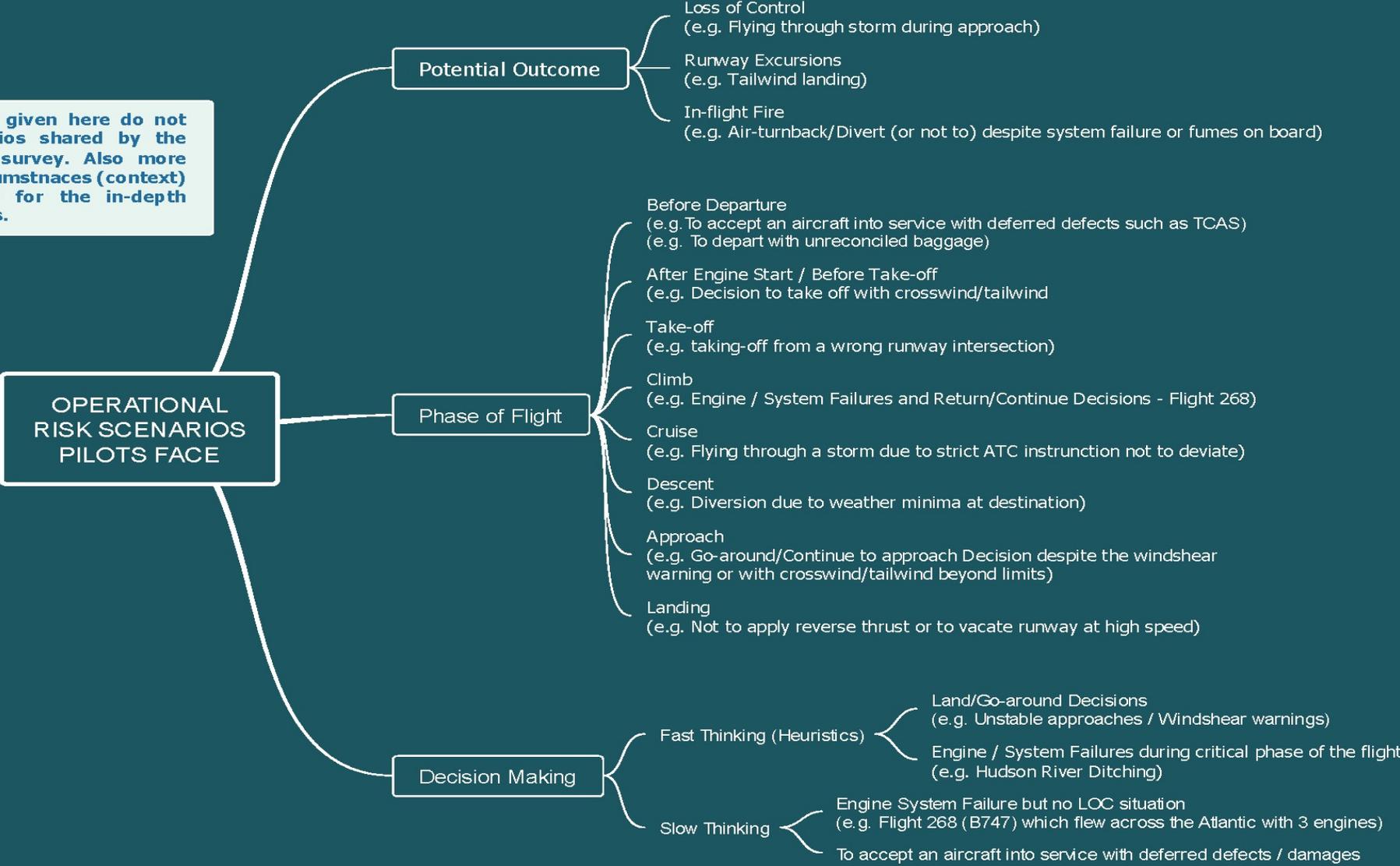
Legal factors i.e. litigation, unrealistic expectations about passenger rights legislation

Media's attitude i.e. victimisation of individuals who make mistakes

RISK DECISIONS CLASSIFICATION



EXAMPLES



Please note the examples given here do not cover all the risk scenarios shared by the respondents to previous survey. Also more information about the circumstances (context) makes all the difference for the in-depth understanding of such risks.

EXAMPLES

Potential Outcome

Loss of Control
(e.g. Flying through storm during approach)

Runway Excursions
(e.g. Tailwind landing)

In-flight Fire
(e.g. Air-turnback/Divert (or not to) despite system failure or fumes on board)

Before Departure
(e.g. To accept an aircraft into service with deferred defects such as TCAS)
(e.g. To depart with unreconciled baggage)

After Engine Start / Before Take-off
(e.g. Decision to take off with crosswind/tailwind)

Take-off
(e.g. taking-off from a wrong runway intersection)

(e.g. Air-turnback/Divert (or not to) despite system failure or fumes on board)

Phase of Flight

Before Departure

(e.g. To accept an aircraft into service with deferred defects such as TCAS)

(e.g. To depart with unreconciled baggage)

After Engine Start / Before Take-off

(e.g. Decision to take off with crosswind/tailwind)

Take-off

(e.g. taking-off from a wrong runway intersection)

Climb

(e.g. Engine / System Failures and Return/Continue Decisions - Flight 268)

Cruise

(e.g. Flying through a storm due to strict ATC instruction not to deviate)

Descent

(e.g. Diversion due to weather minima at destination)

Approach

(e.g. Go-around/Continue to approach Decision despite the windshear warning or with crosswind/tailwind beyond limits)

Landing

(e.g. Not to apply reverse thrust or to vacate runway at high speed)

Land/Go-around Decisions

(e.g. Unstable approaches / Windshear warnings)

(e.g. Diversion due to weather minima at destination)

Approach

(e.g. Go-around/Continue to approach Decision despite the windshear warning or with crosswind/tailwind beyond limits)

Landing

(e.g. Not to apply reverse thrust or to vacate runway at high speed)

Decision Making

Fast Thinking (Heuristics)

Land/Go-around Decisions

(e.g. Unstable approaches / Windshear warnings)

Engine / System Failures during critical phase of the flight

(e.g. Hudson River Ditching)

Slow Thinking

Engine System Failure but no LOC situation

(e.g. Flight 268 (B747) which flew across the Atlantic with 3 engines)

To accept an aircraft into service with deferred defects / damages



2016 ● 1st RISK CULTURE SURVEY IN CAT INDUSTRY

2017 ● 2nd RISK CULTURE SURVEY IN CAT INDUSTRY

2018 ● DEVELOPMENT OF ORGANISATIONAL RISK
BEHAVIOUR FRAMEWORK

2021 ● COLLABORATIVE STUDY (BALPA, CRANFIELD,
COGNITIVE EDGE) VALIDATION OF FRAMEWORK



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TYOLOGY OF ORGANISATIONAL RISK BEHAVIOUR

Based on the concept of "Four States of Man" coined by Hon. Lord Justice Charles Haddon-Cave

BANKRUPTCY

EFFECTIVE RISK MANAGEMENT

RISK AVERSE

HIGH RISK PROTECTION

Reduced Exposure

RISK SENSIBLE

I don't understand the risk and I fear the worst outcome.

I understand risk well and make informed and balanced decisions

POOR UNDERSTANDING OF RISK

GOOD UNDERSTANDING OF RISK

I don't know and I don't want to know.

*"Risk is our business"
Captain Kirk*

RISK IGNORANT

LOW RISK PROTECTION

Increased Exposure

RISK CAVALIER

WILFUL BLINDNESS

ACCIDENT

**THE AIM IS NOT TO LABEL ANY INDIVIDUAL,
DEPARTMENT, PROFESSIONAL GROUP OR THE ENTIRE
ORGANISATION BASED ON THIS FRAMEWORK**

THE AIM IS TO IDENTIFY OPERATIONAL RISK
DECISIONS AND **BY DIALOGUE** TO CREATE A
COMMON UNDERSTANDING OF RISK AND MOVE
TOWARDS A **'RISK SENSIBLE'** POSITION.

2016 ● 1st RISK CULTURE SURVEY IN CAT INDUSTRY

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Making Sense of Aviation Safety

A Collaborative Study



Making Sense of Aviation Safety

FIRST SHARE YOUR 'LIVED EXPERIENCE'

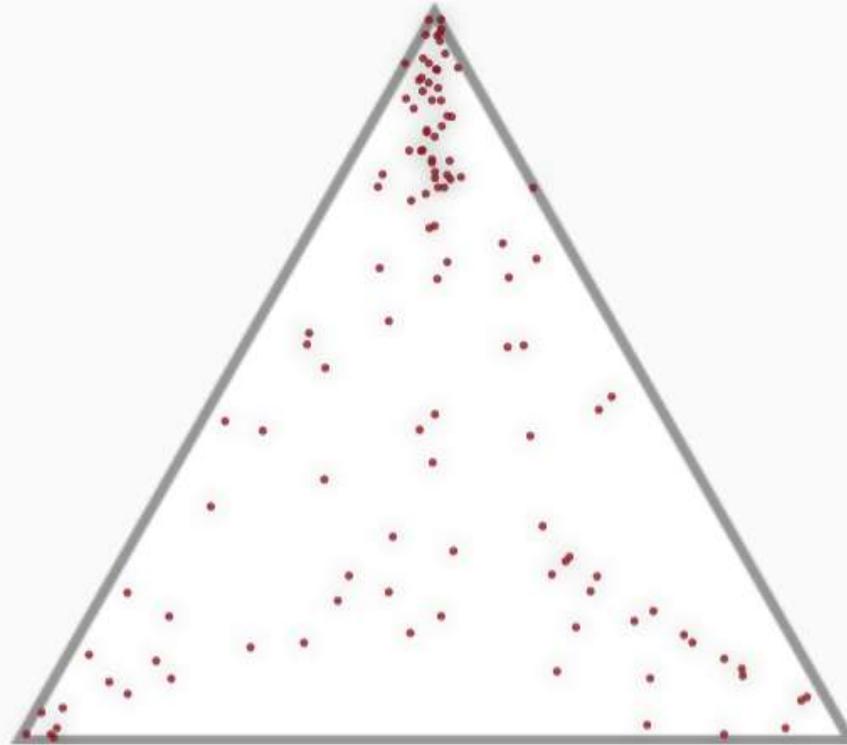
THEN ANALYSE YOUR OWN STORY BY ANSWERING UNIQUE QUESTIONS

Results of the 'Making Sense of Aviation' Study

⋮ T3 - In this situation we chose to...

⋮

stay strictly within the procedures



deviate slightly from procedures

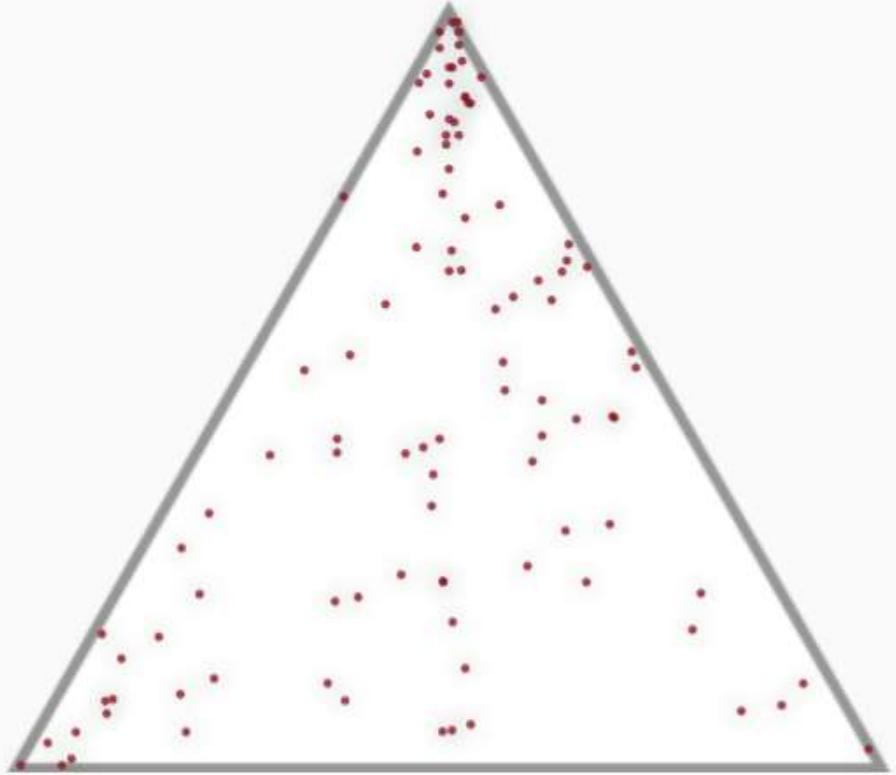
use a novel solution

Results of the 'Making Sense of Aviation' Study

⌵ T2 - During decision making, pressure was felt from...

⌵

company commercial



personal reasons (fatigue, ability etc.)

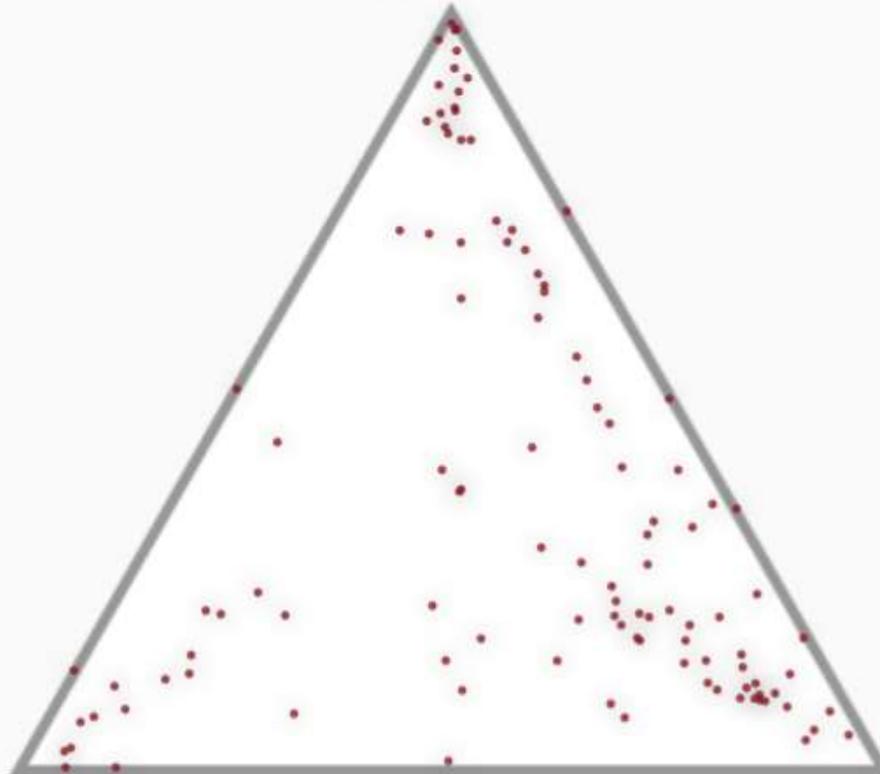
customer expectation

Results of the 'Making Sense of Aviation' Study

⋮ T5 - Risk was managed by...



avoidance



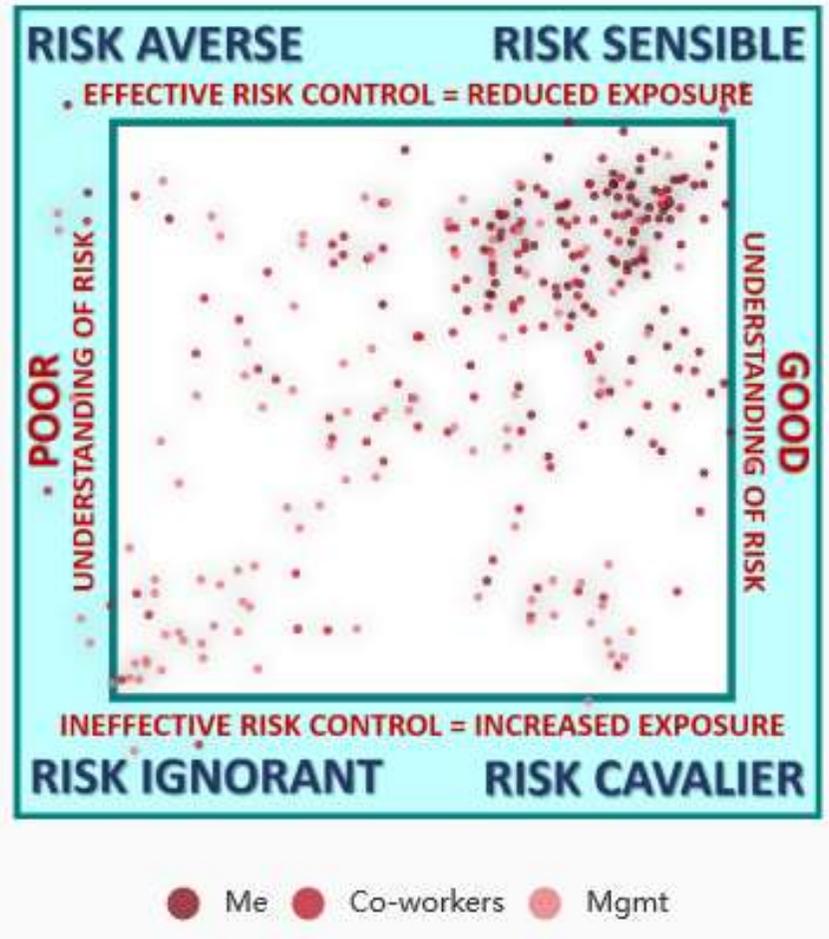
tolerance

mitigation

Results of the 'Making Sense of Aviation' Study

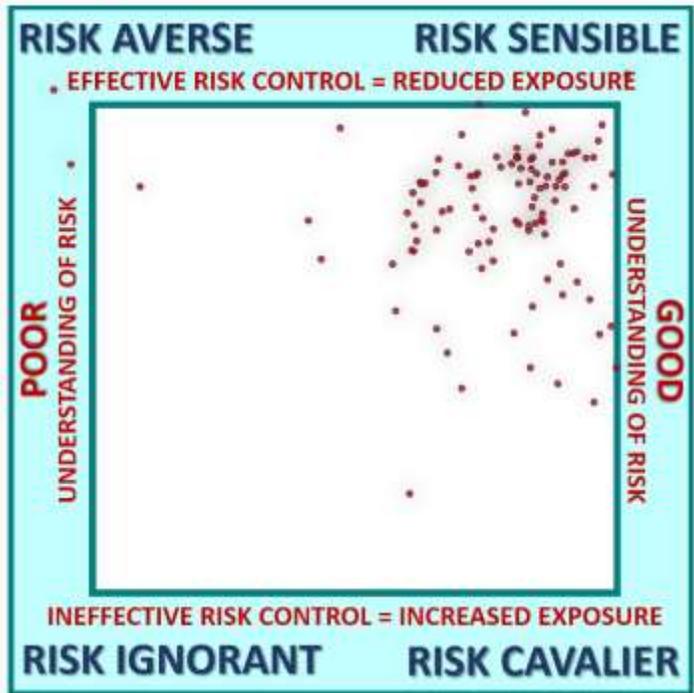


Results of the 'Making Sense of Aviation' Study



RISK AS ANALYSED/ASSESSED vs RISK AS MANAGED/TOLERATED

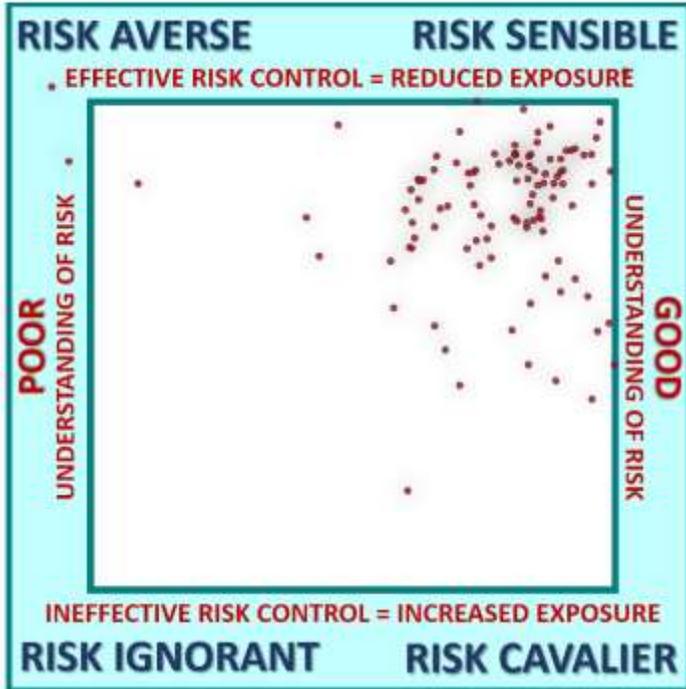
ME



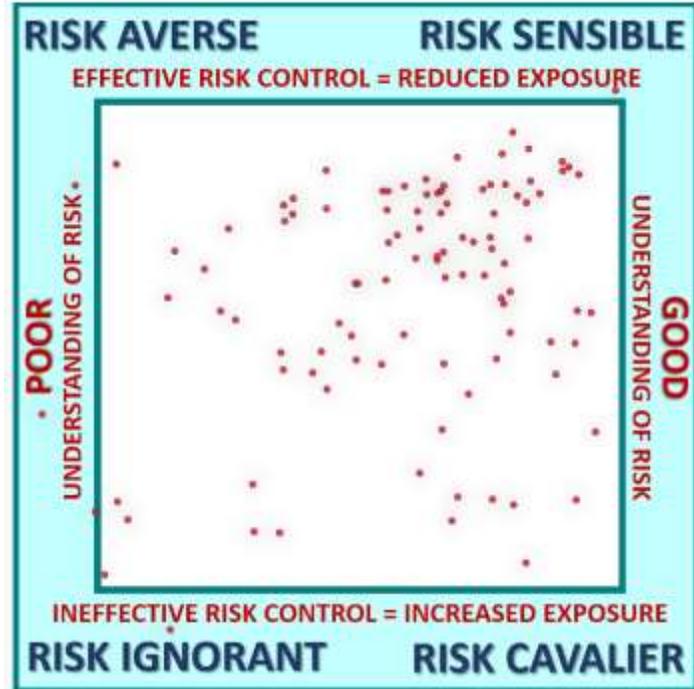
Data was collected between May 2021 and Jan 2022 as part of a collaborative study between BALPA, Cognitive Edge and Cranfield University. A total of 125 pilots responded and shared their operational experiences about complex scenarios they faced during the pandemic.

RISK AS ANALYSED/ASSESSED vs RISK AS MANAGED/TOLERATED

ME



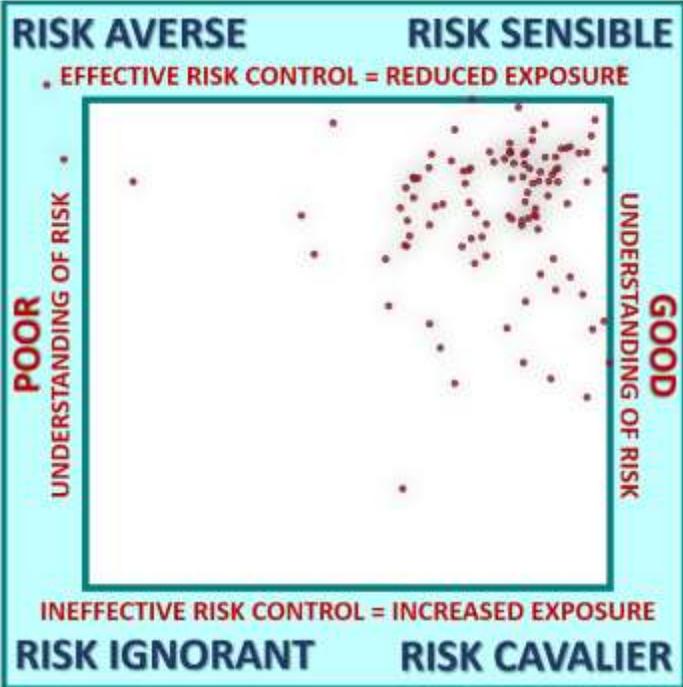
CO-WORKERS



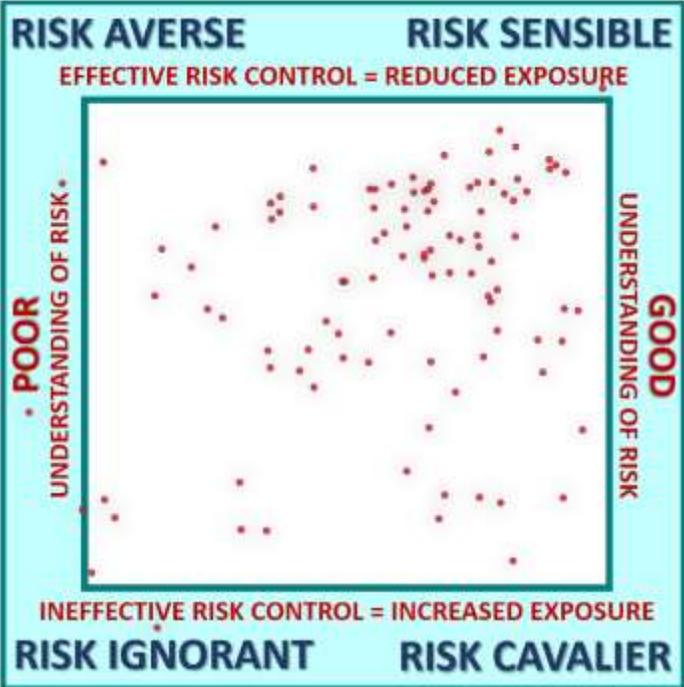
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RISK AS ANALYSED/ASSESSED vs RISK AS MANAGED/TOLERATED

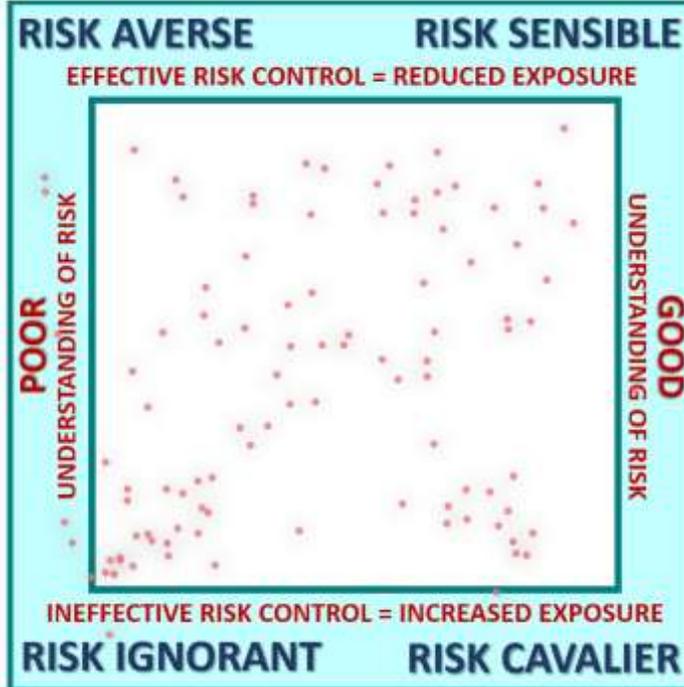
ME



CO-WORKERS



MANAGEMENT



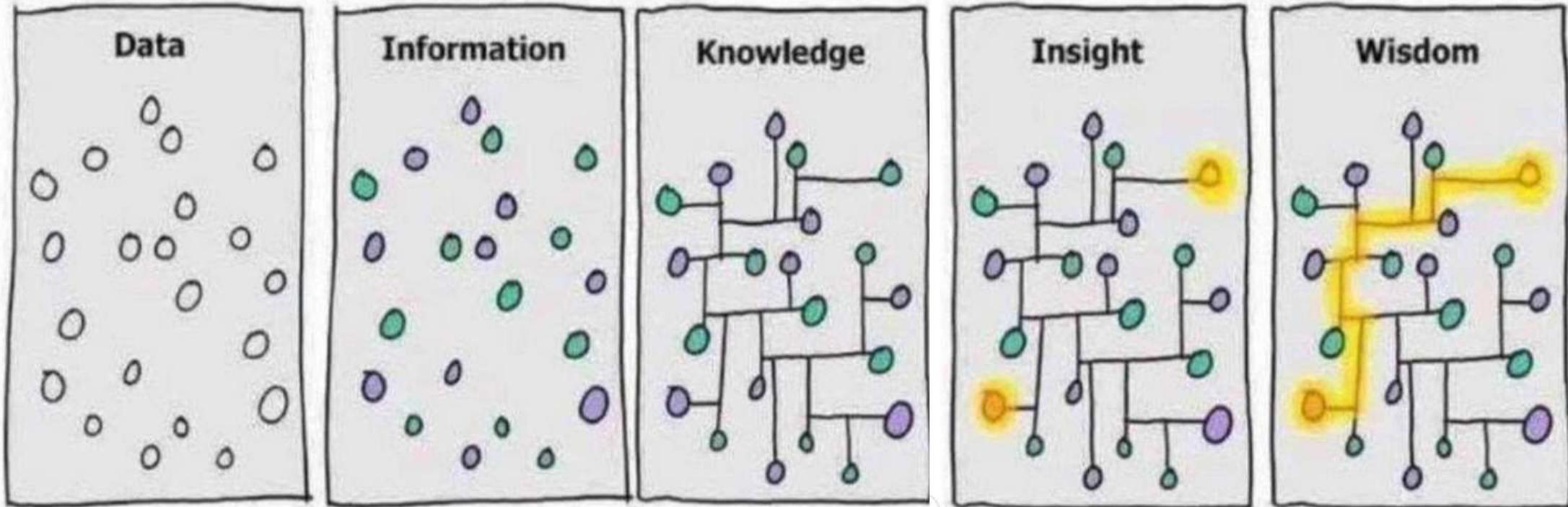
Data was collected between May 2021 and Jan 2022 as part of a collaborative study between BALPA, Cognitive Edge and Cranfield University. A total of 125 pilots responded and shared their operational experiences about complex scenarios they faced during the pandemic.

KEY TAKEAWAYS

**DETECTING WEAK SIGNALS IN A COMPLEX
SOCIOTECHNICAL ECO SYSTEM IS IMPORTANT**

**TRANSFORMING SAFETY DATA
INTO SAFETY WISDOM**

OUR AIM SHOULD BE TO ACHIEVE WISDOM



WE NEED TO AVOID ANALYSIS PARALYSIS

BIG DATA vs THICK DATA vs RICH DATA

If You Torture the Data Long Enough, It Will Confess to Anything

Ronald Coase? Irving John Good? Charles D. Hendrix? Robert W. Flower? Bulent Gultekin? Anonymous?

Source: <https://quoteinvestigator.com/2021/01/18/confess/>

BIG DATA NEEDS THICK DATA - ETHNOGRAPHY

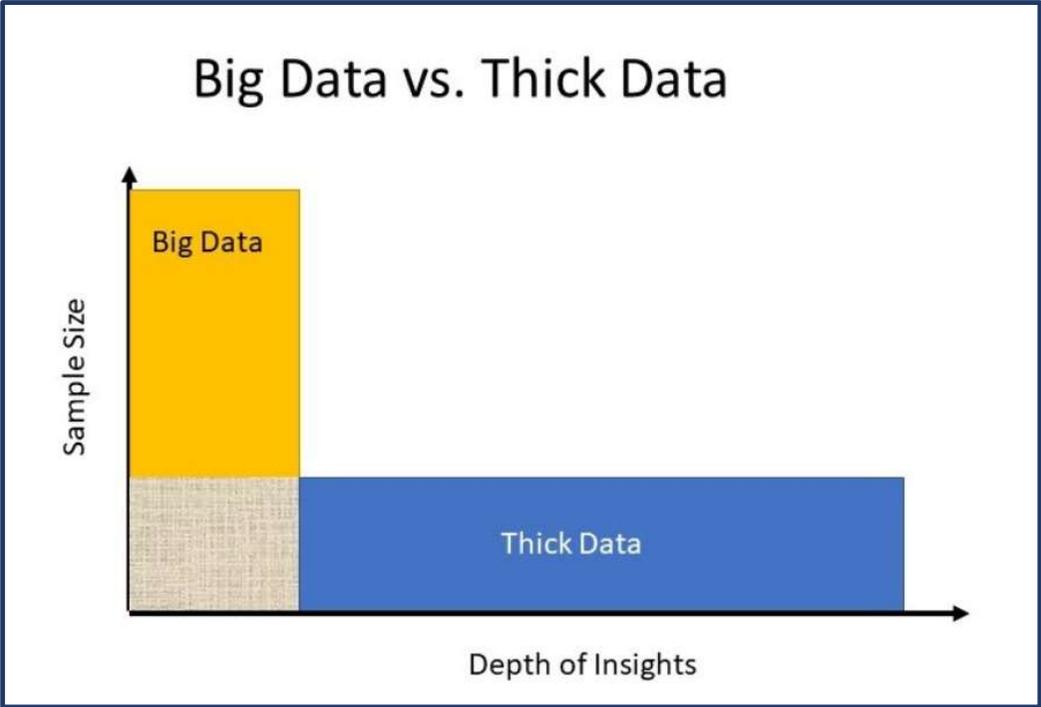
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Weak Signals Approach to ANSP Safety Performance

Introduction

"Creating foresight", "anticipating future threats" and "how to be prepared for possible future surprises" are fundamental issues in managing today's complex socio-technical systems. Traditional safety approaches use after-the-event data to evaluate the organisation's safety level. This is based on the theoretical understanding that safety is seen as the absence of unwanted consequences. Consequently, managing safety is seen as the avoidance or elimination of negative outcomes. This safety approach follows the credo of improving safety by learning from errors and mishaps. Organisations with this understanding may learn from past events, but hardly pro-actively anticipate future threats.

In the current complex socio-technical systems, traditional theories of safety that follow a structural view and focus only on the negative limit the understanding of the interactive complexity and dynamics are inherent in such systems. Only finding and counting human errors, failures or breakdowns is no appropriate way to get a better insight of how today's systems work and possibly fail. A better understanding of the interactions and couplings of system components is necessary.

The following presentation illustrates the traditional approach of managing safety.

Article Information

Category: [Organisation and Human Performance](#)



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Content control: [SKYbrary](#)



2014

“Weak Signals in ANSP’s Safety Performance”
Theoretical Framework



2021



Patterns in How People Think and Work
Importance of Patterns Discovery for Understanding
Complex Adaptive Systems

2022



Unearthing **Weak Signals** for safer and
more efficient socio-technical systems

The Structured Exploration of Complex Adaptations (SECA) method



R

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C U L T U R E

**DO YOU HAVE
A STORY
TO TELL ABOUT
EXCESSIVE OR
UNNECESSARY
RISK TAKING**



**PLEASE DO GET IN TOUCH
I AM HERE TO LISTEN**



www.riskculture.org
email@riskculture.org



THANK YOU FOR YOUR ATTENTION