Industry Day – Rome 27th May 2016

SMS implementation in Airworthiness Organisations

Cengiz Turkoglu

Lecturer & Researcher @

Chair of the Technical Comm.

Vice Chairman

Ex-Communication TF Leader

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.

HUMAN ERROR (STILL A CHALLENGE)

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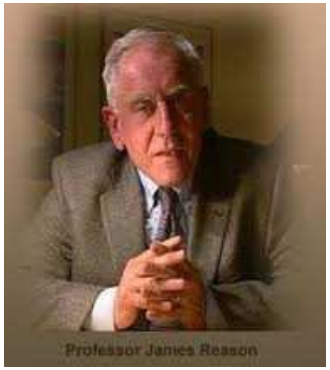
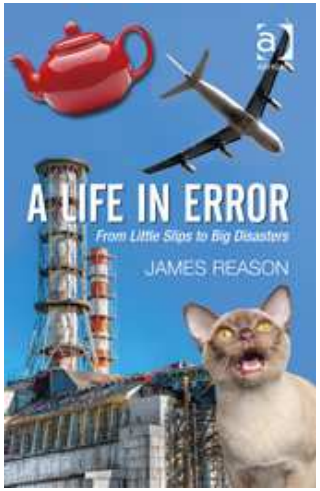




"The journey begins with a bizarre absent-minded action slip committed by Professor Reason in the early 1970s - putting cat food into the teapot - and continues up to the present day."

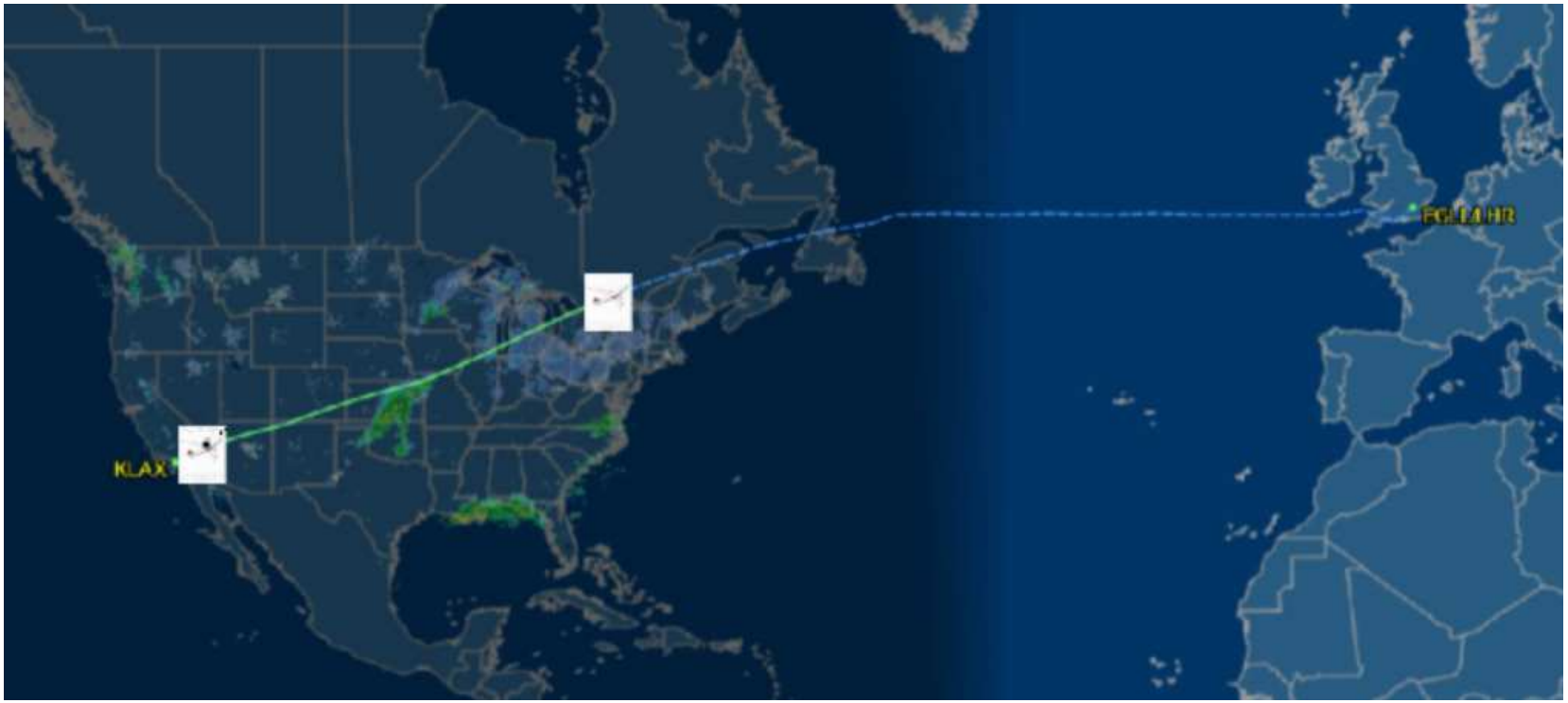
Source: https://www.amazon.ca/Life-Error-Little-Slips-Disasters/dp/1472418417/175-9532292-4801809?ie=UTF8&*Version*=1&*entries*=0

Flight 268 – Case Study

In 2005, on a night flight from Los Angeles to London, immediately after take off, a banging sound was heard and passengers and ATC reported seeing flames from the No 2 engine of the B747. The symptoms and resultant turbine over-temperature were consistent with an engine surge; the crew completed the appropriate checklist, which led to the engine being shut down.

Should this flight continue or return back?

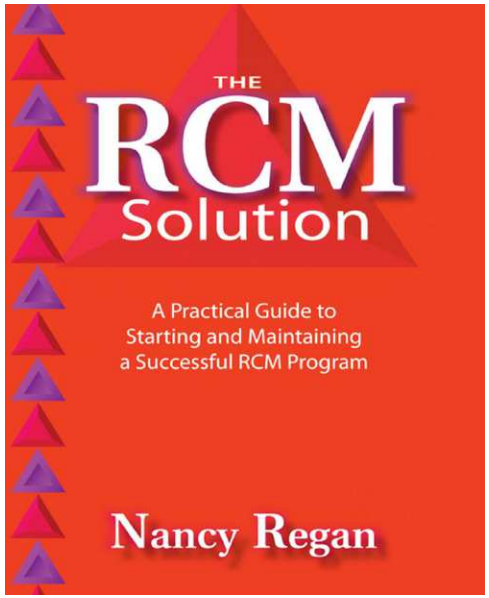
Flight 268 – Case Study



After assessing the situation, and in accordance with approved policy, the commander decided to continue the flight as planned rather than jettison fuel and return to Los Angeles. Having reached the east coast of the USA with no indications of further abnormality and with adequate predicted arrival fuel,

Should this flight continue or divert?

Flight 268 – Case Study



The pilots successfully shut down the affected engine and notified the headquarters. **The management directed Flight 268 to carry on** with the flight to London. Senior Manager of B747 fleet said:

"The decision to continue flying was a customer service issue. The plane is as safe on 3 engines as is on four and it can fly on two." The company quickly assessed the consequences of the failure. If they had delayed or cancelled the flight, it would have **cost the company up to several hundred thousand dollars in passenger compensation** because of a recently passed European regulation regarding long flight delays or cancellations.

Source: Regan, Nancy, 2012, The RCM Solution: Reliability-Centred Maintenance, (Page 117, 118), Industrial Press Inc.
https://books.google.co.uk/books?id=UQiDBgAAQBAJ&pg=PA117&lpg=PA117&dq=british+airways+flight+268+engine+failure+2005&source=bl&ots=gidx-s6PdT&sig=HfwN-ao7LunprXzf7La933_z0jA&hl=en&sa=X&ved=0ahUKEwj4_arnx-XLAhVEWRoKHXFPBlUQ6AEINDAE#v=onepage&q=british%20airways%20flight%20268%20engine%20failure%202005&f=false

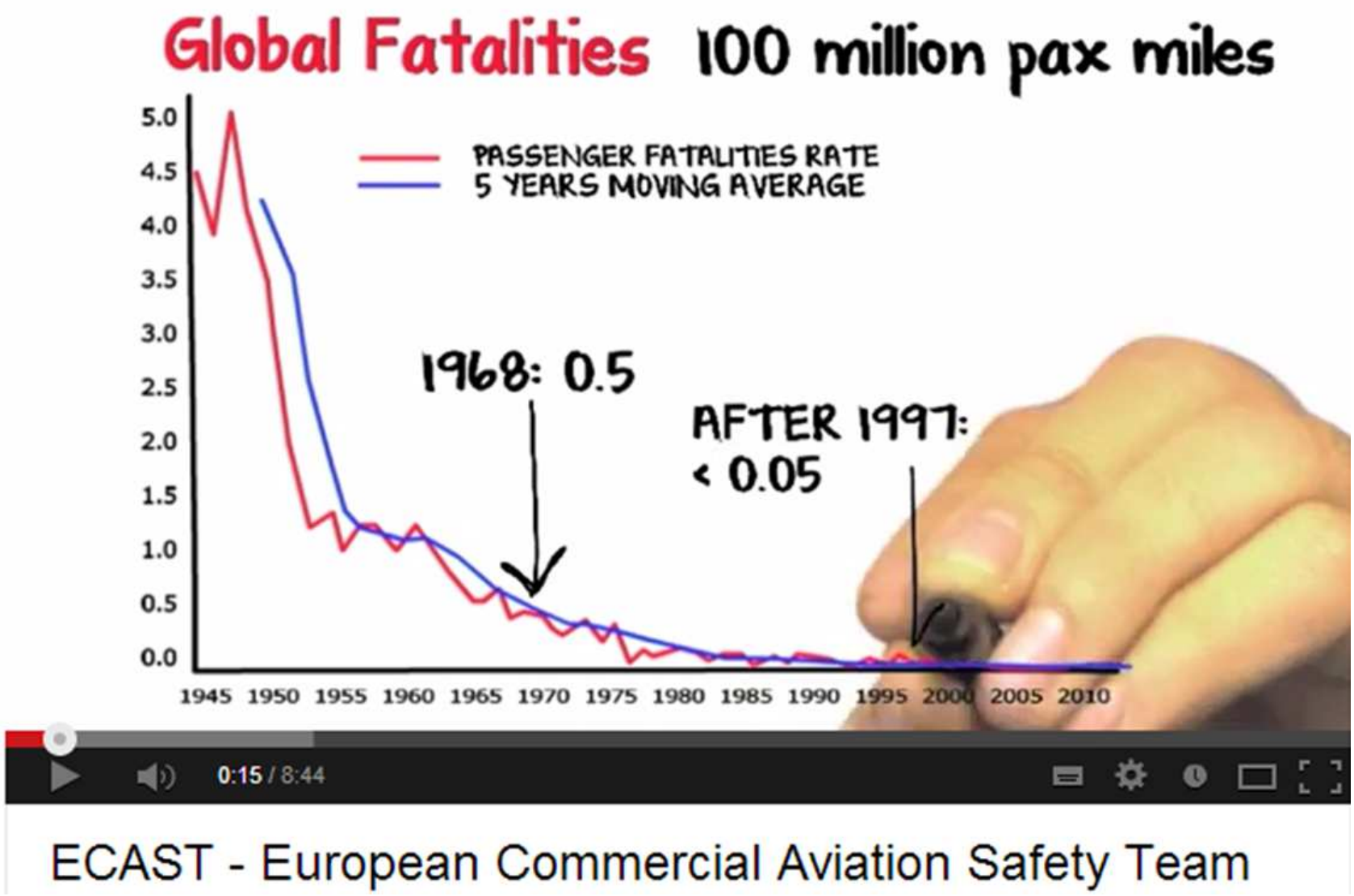
an argument for introducing

Risk Culture

as a new component of ‘Safety Culture’

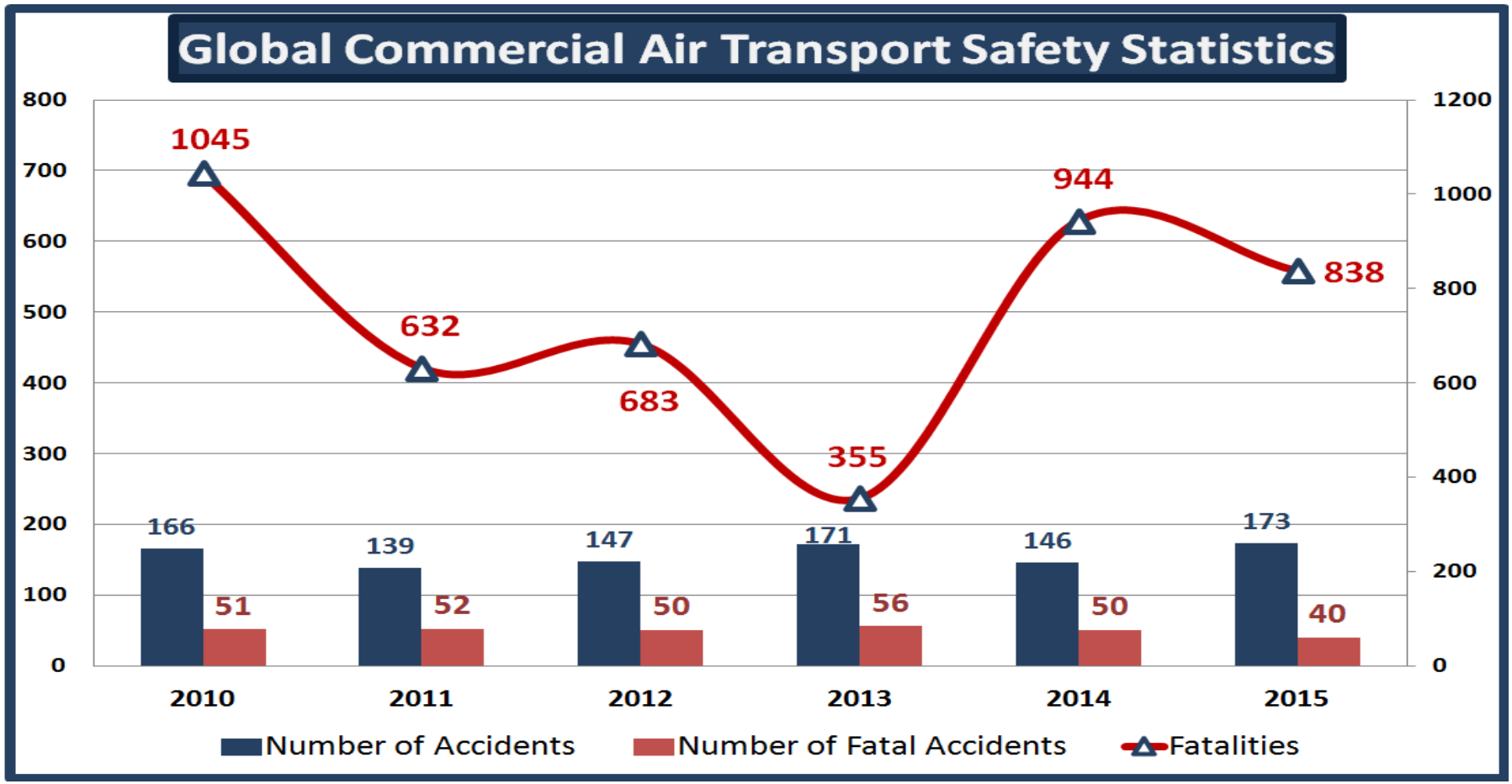
A FEW WORDS ABOUT THE STATE OF THE AIRLINE INDUSTRY IN 2016 AND FUTURE TARGETS

ULTRA-SAFE SYSTEM & CHALLENGES



https://youtu.be/IgDyhvXW8jM

ULTRA-SAFE SYSTEM & CHALLENGES



Source: Data compiled from Aviation Safety Network Database (http://aviation-safety.net/database/) & analysed by Cengiz Turkoglu. Military aviation accidents and also events caused by hostile action (i.e. a number of aircraft destroyed on the ground at Tripoli in 2014) were excluded.

ULTRA-SAFE SYSTEM & CHALLENGES

PROSPERO Context – Ultra-safe Systems

10^{-6} or better:

The **next accident has never been seen before**. Its decomposition may invoke a series of already seen micro incidents, although most have been deemed inconsequential for safety.

Source: Nick McDonald, Centre for Innovative Human Systems, Trinity College Dublin, PROSPERO Presentation @ Aerodays 2015

STATE OF THE AIRLINE INDUSTRY

What drives the most cost conscious airline to operate business jets in order to deal with AOG across its network?

Monday 14 September 2015

Business Newsletter

Business Irish

Ryanair's fancy jet 'for engineers'

Grainne Cunningham

PUBLISHED
24/10/2012 | 05:00

SHARE

NO ONE could seriously accuse Ryanair of indulging in life's little luxuries -- so if the low-cost airline has acquired a fancy jet, it must be a money-saving device.

http://www.independent.ie/business/irish/ryanairs-fancy-jet-for-engineers-28822767.html

PUBLIC'S EXPECTATION?

BRUTAL COMPETITION?

Ryanair acquires new Learjet 45 M-ABGV

http://irishaviationresearchinstitute.blogspot.co.uk/2014/06/ryanair-acquires-new-learjet-45-m-abgv.html

Irish ultra low cost carrier Ryanair has recently acquired a second Learjet 45 to support it's growing operation across Europe, ahead of taking delivery of 180 new Boeing 737-800s from September 2014 onwards.

Aircraft will achieve a **five-fold reduction in the average accident** rate of global operators.

Aircraft will **drastically reduce the impact of human error**.

The occurrence and impact of human error is significantly reduced through new designs and training processes and through technologies that support decision-making.

if we want to achieve such goals, we need to THINK DIFFERENTLY

we need to continue ...

making intelligent rules	and complying with them
collecting operational data	and investigating to learn lessons

but predicting future, based on occurrence data and past performance has its limitations !

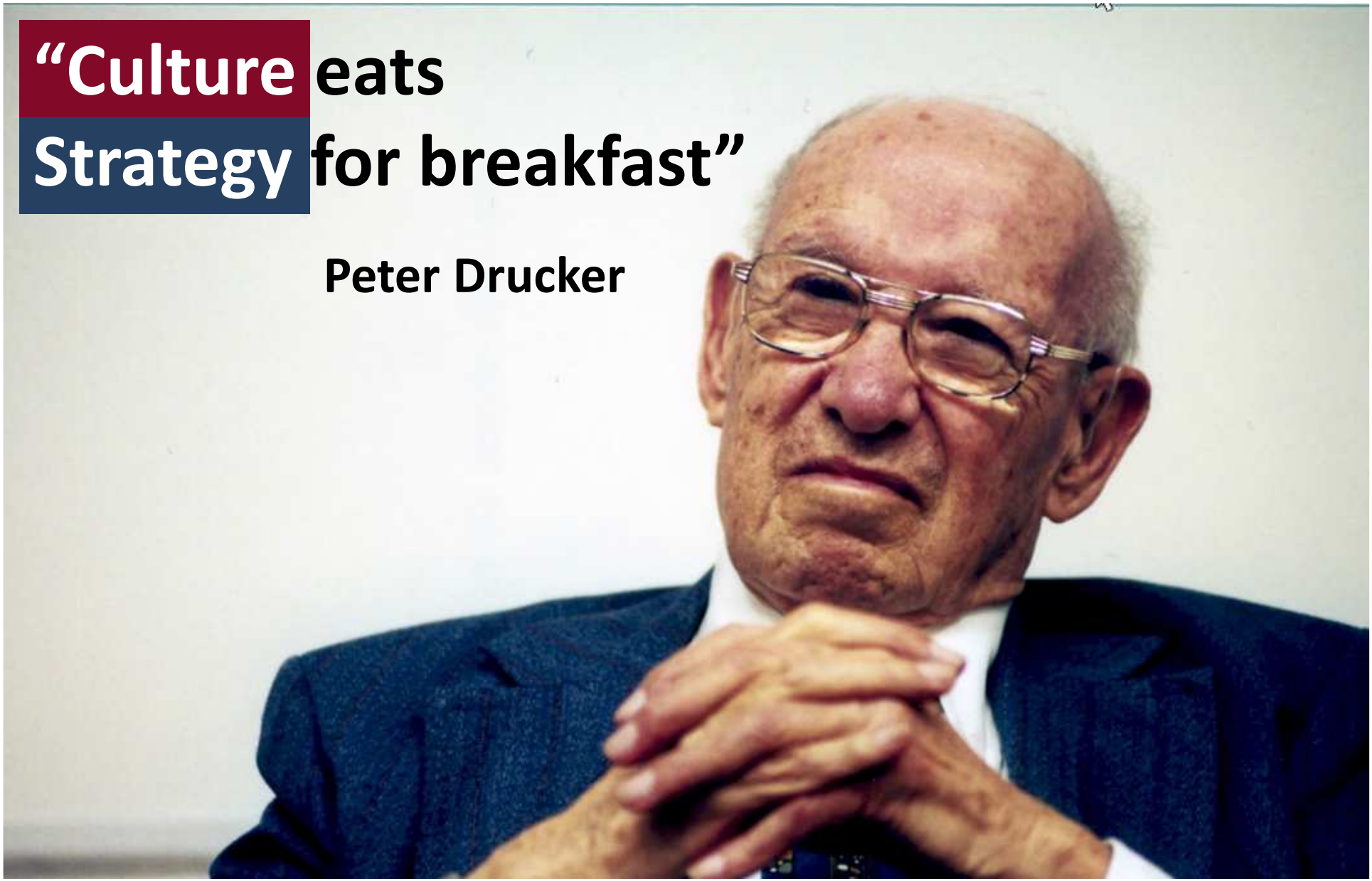
WHY RISK CULTURE?

This is an argument based on some of the 'Safety Culture' concepts and models well-known and applied in aviation.

It aims to add another component to the existing framework based on the 'Risk Culture' guidance material produced by Institute of Risk Management (IRM), which was developed to supplement ISO 31000 *Risk management – Principles and guidelines*.


RISK
CULTURE


#1
CULTURE
MATTERS

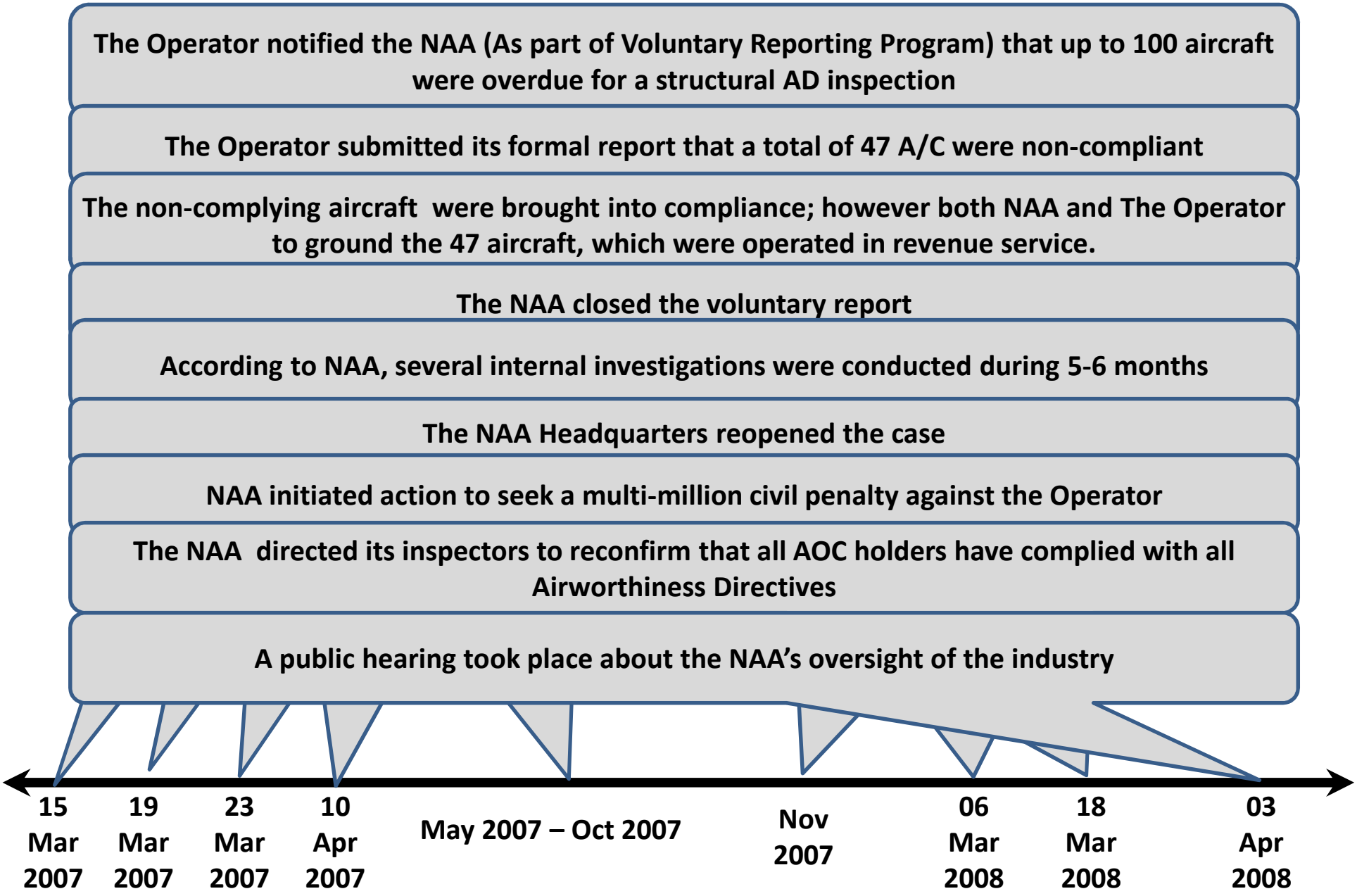


Drucker's well known quote sums it up. **Achieving results heavily depends on the organisational culture** however good the strategy is.

Corporate Culture - Key to Success


#2
MATTERS
CULTURE
DOES
RISK

Case Study – Flying A/C with AD Non-compliances



ENTRPRENURSHIP & RISK ATTITUDE

FUNDAMENTAL CONCEPTS & PREMISES FOR THE ARGUMENT

INTRODUCING

‘RISK CULTURE’

AS A NEW COMPONENT OF

‘SAFETY CULTURE’

RISK = SEVERITY X LIKELIHOOD

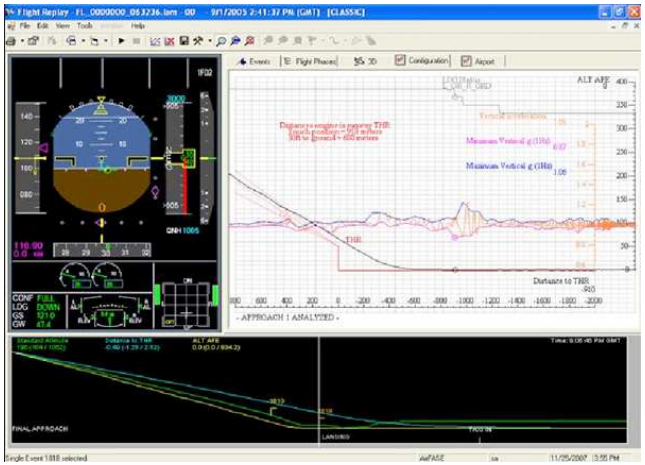
Safety risk is the projected likelihood and severity of the consequences or outcomes from an existing hazard or situation.

(ICAO SMM)

R I S K

RISK MANAGEMENT

1 HAZARD IDENTIFICATION



REACTIVE

PROACTIVE

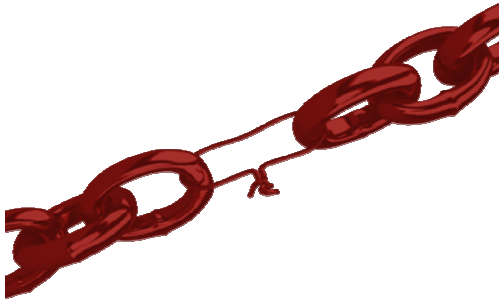
PREDICTIVE

RISK MANAGEMENT

2 RISK ASSESSMENT

ANALYSING

QUANTIFYING



PRIORITISING

RISK MANAGEMENT

3

RISK CONTROL

MITIGATING

ELIMINATING

BALANCING

‘acceptable level of safety’

‘perception of risk’

‘risk attitude’

‘risk tolerability’

‘risk appetite’

inevitably subjective

based on many different factors

here are some examples ...

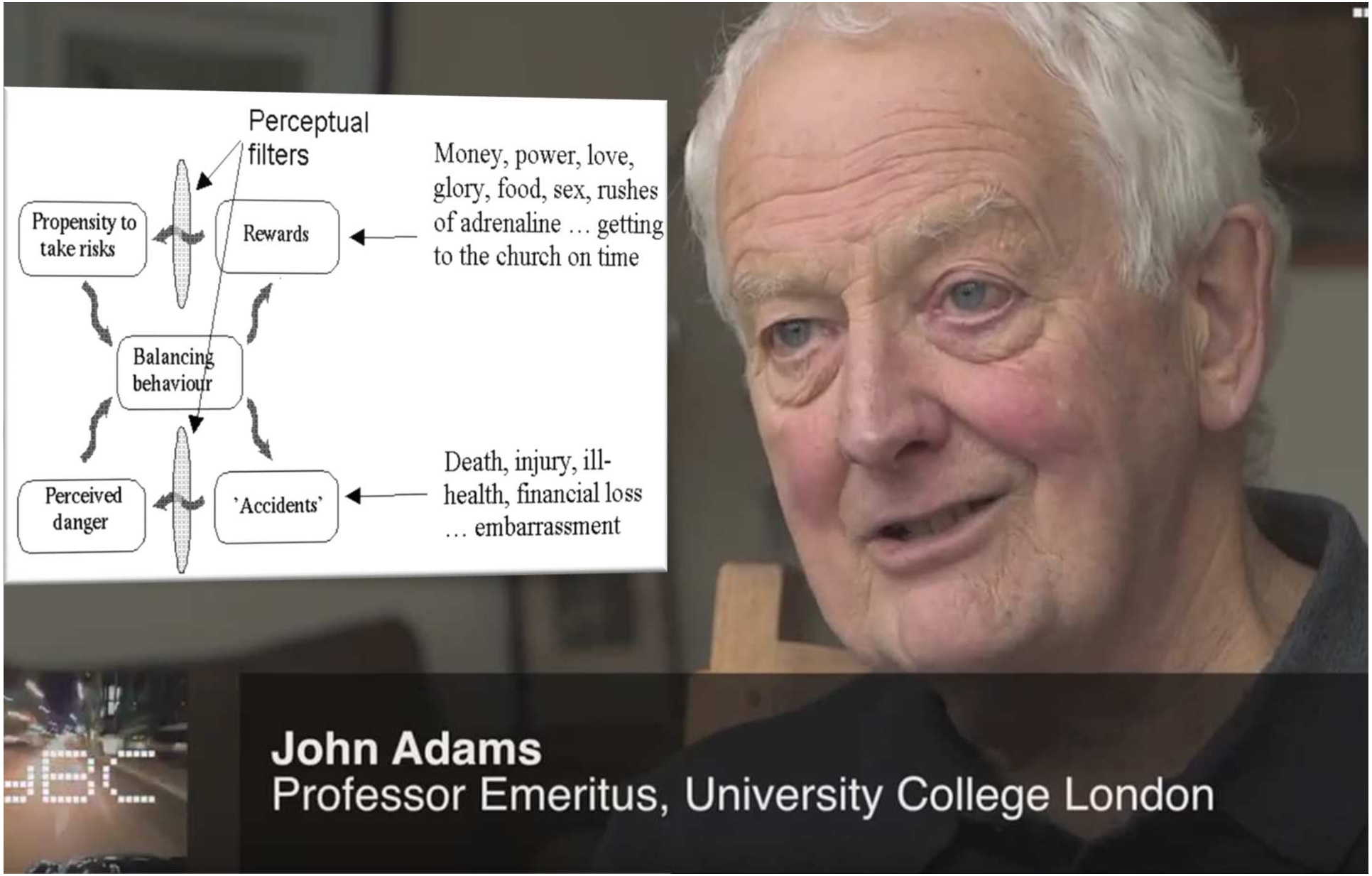

TIME DIMENSION
What was acceptable in the past is not acceptable today


NATIONAL CULTURE
What is acceptable in one country is not acceptable in another.


NHK WORLD
BEFORE
AFTER
HINDSIGHT BIAS
What is acceptable before an accident may not be acceptable after the event
NHK WORLD
NEWSLINE


PERSONAL CHOICES
What is acceptable to one person may not be acceptable to another

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

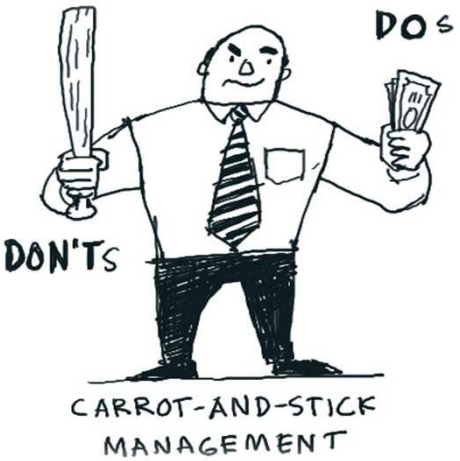


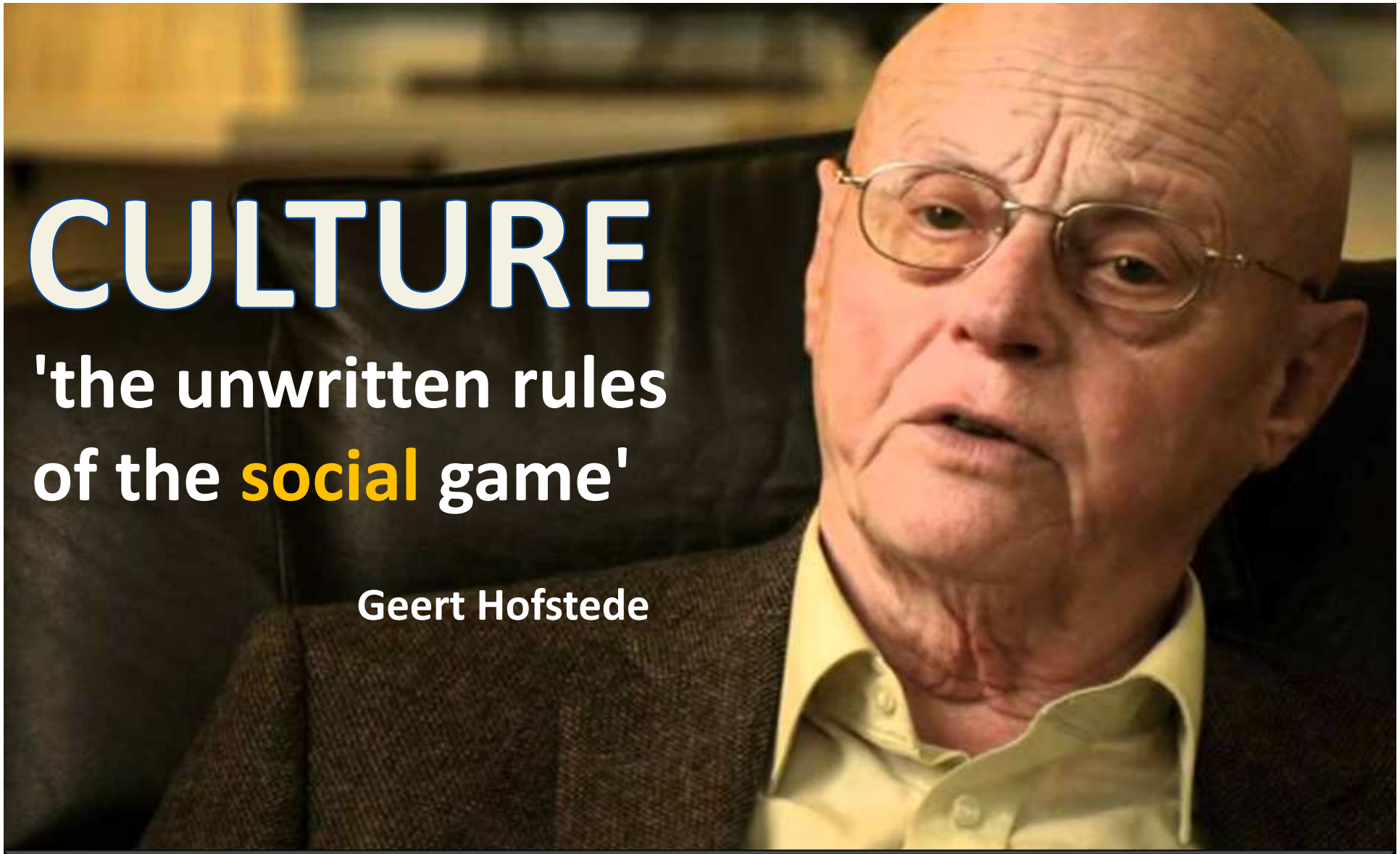
Front line operators facing

conflicting goals influenced by external factors and

incentives and penalties to achieve them

are typical characteristics of the airline industry





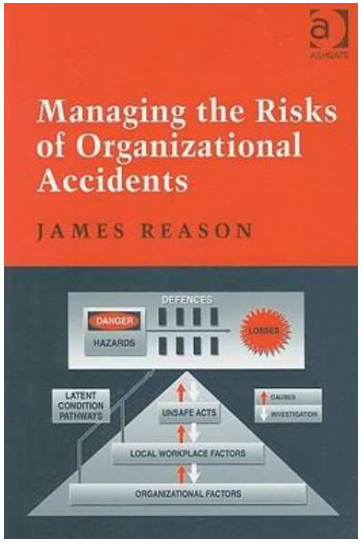
Commercial Air Transport: ‘A Complex Socio-technical System’

“engineering a safety culture”
(an informed culture)

Prof. J Reason

just culture

1 9 9 7



reporting culture

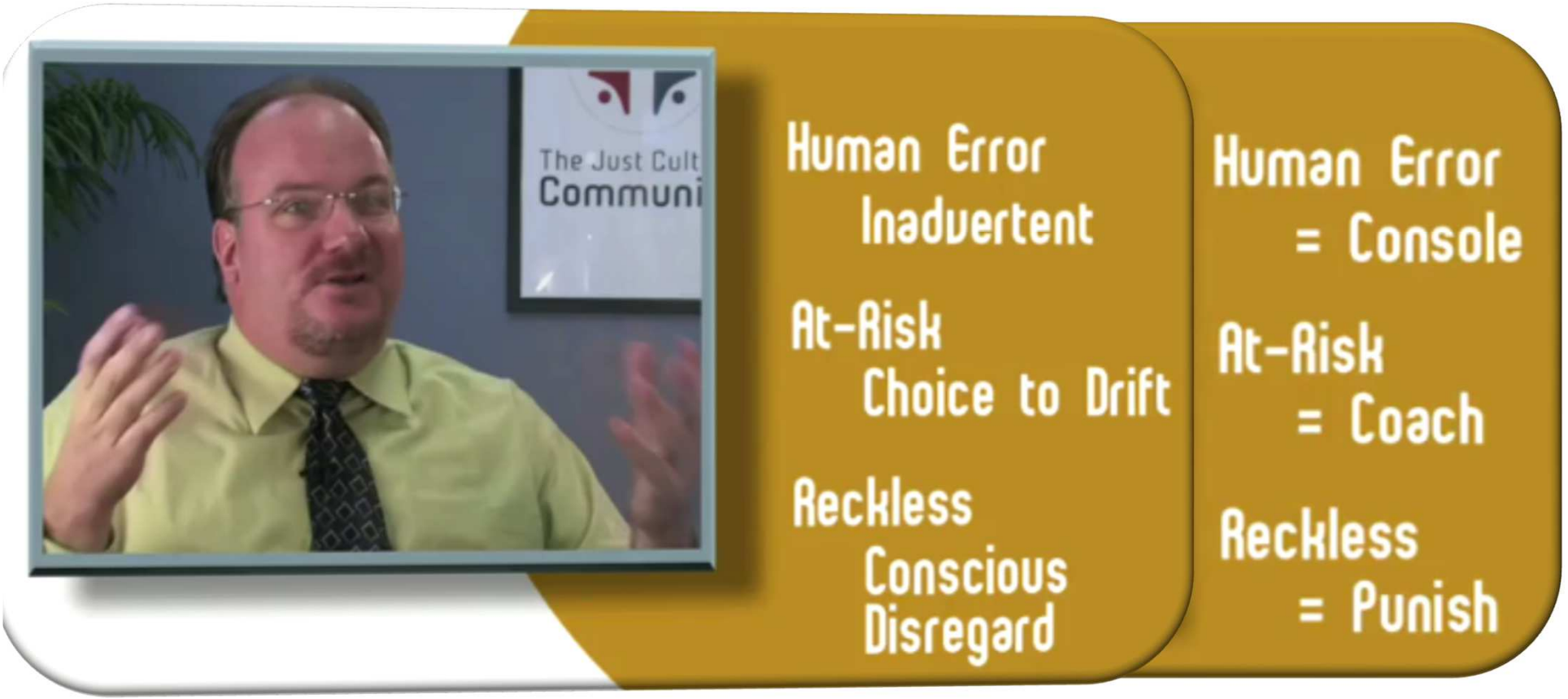
learning culture

flexible culture

2016 - *risk culture?*

Just Culture

three categories of human behaviour (by David Marx)



Reckless (Negligent) **At Risk (Risk Taking)** **Error (Mistake)**

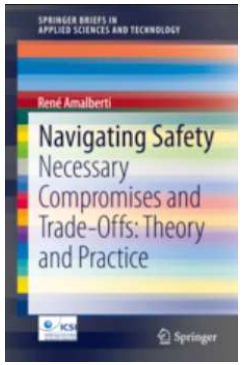
paradoxes

criminalisation of accidents,

and the **litigation culture** in society, …

does ‘compensation culture’ lead to …

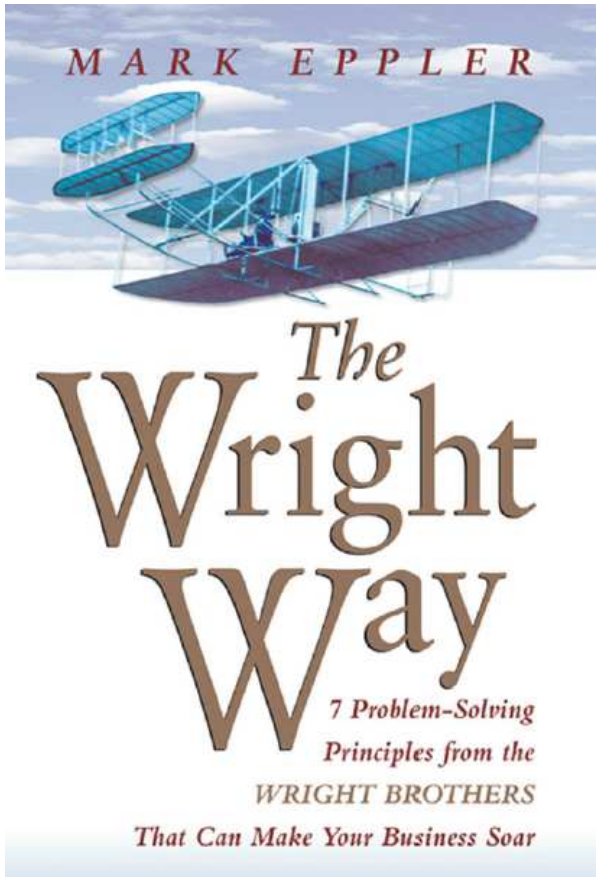
‘risk blindness’ in society?



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

René Amalberti

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

HUMAN ELEMENT IS THE KEY TO ENSURING FLIGHT SAFETY

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 means,

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?

The concept of

‘Risk Culture’

evaluation in an organisation

let's not try to measure culture

?

> ***"Not everything that counts can be counted, and not everything that can be counted counts"***
>
> W. B. Cameron (widely attributed to Albert Einstein)
>
> **Source: This quote was used by Dr. John Carroll, MIT Sloan School of Management at the NTSB's 2 day event on Safety Culture 10-11 September 2013**

A quote that is incorrectly attributed to W. Edwards Deming. **"You can't manage what you can't measure."**

In fact, he repeatedly said the opposite **"It is wrong to suppose that if you can't measure it, you can't manage it – a costly myth."** Source: http://blog.deming.org/w-edwards-deming-quotes/large-list-of-quotes-by-w-edwards-deming/

THE SEVEN DEADLY DISEASES OF MANAGEMENT (Item 5)

"Management by use only of visible figures, with little or no consideration of figures that are unknown or unknowable." Source: Deming, W. Edwards (2011-11-09). Out of the Crisis (pp. 97-98). MIT Press.

SIMPLICITY IS THE ANSWER, WHAT'S THE QUESTION?

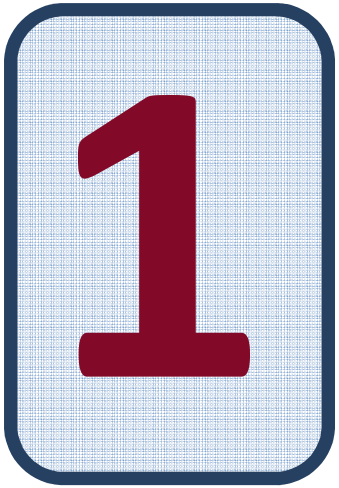
"Any intelligent fool can make things bigger and more complex...

It takes a touch of genius and a lot of courage to move in the opposite direction."

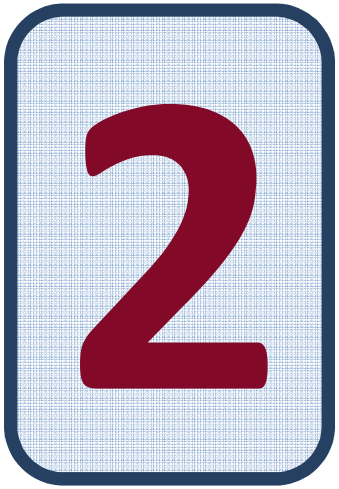
E.F. Schumacher

let's not ask 10's of questions

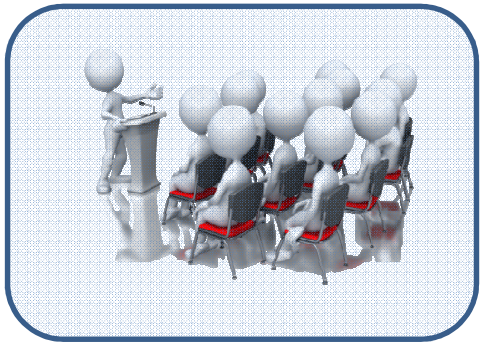
2 simple but fundamental questions…



A scenario & decision
‘accepted/acceptable risk’



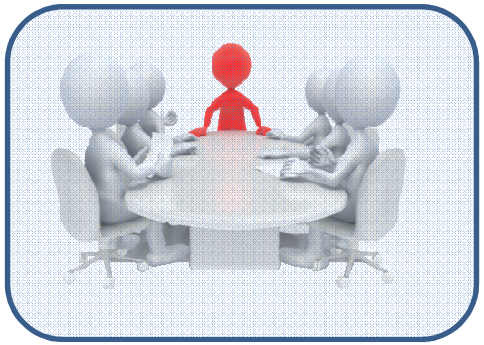
A scenario & decision
‘unacceptable/rejected risk’



stage 1

collect data from front line staff

(dedicated workshops or during recurrent training or questionnaires)



stage 2

ask the same risk decisions to senior management

stage 3

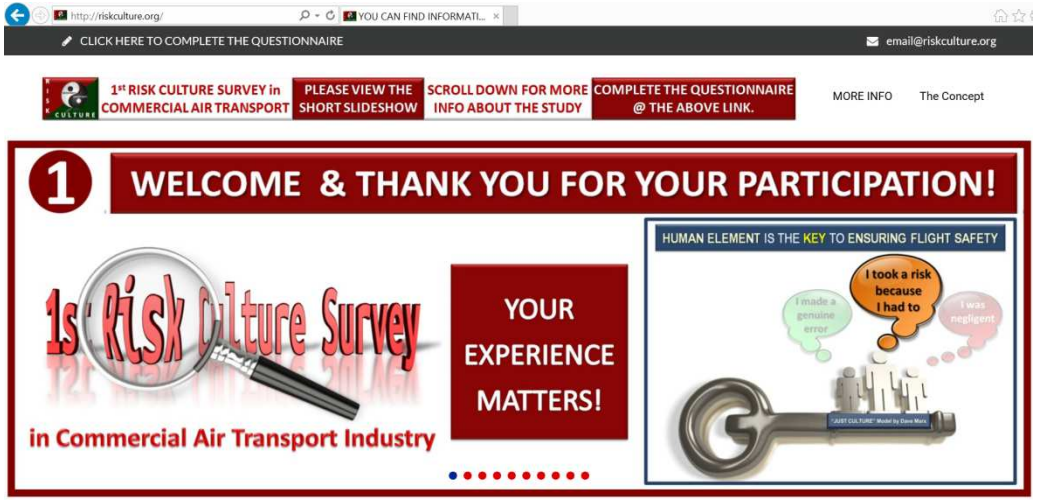
analysis of data, which may:

- reveal gaps in risk perception/attitude/appetite
- require management action to clarify acceptable &unacceptable risks

So far .....

- **2 workshops conducted**
  - **As part of Operators' internal safety event**
  - **1 in Far East and 1 EU Operator**
- **Limited data collected**
- **Good news – Limited opportunity to take risks**
- **Common themes on risk taking behaviour**
  - **Acceptance of Defects**
  - **Commercial Pressure**
  - **Fatigue**

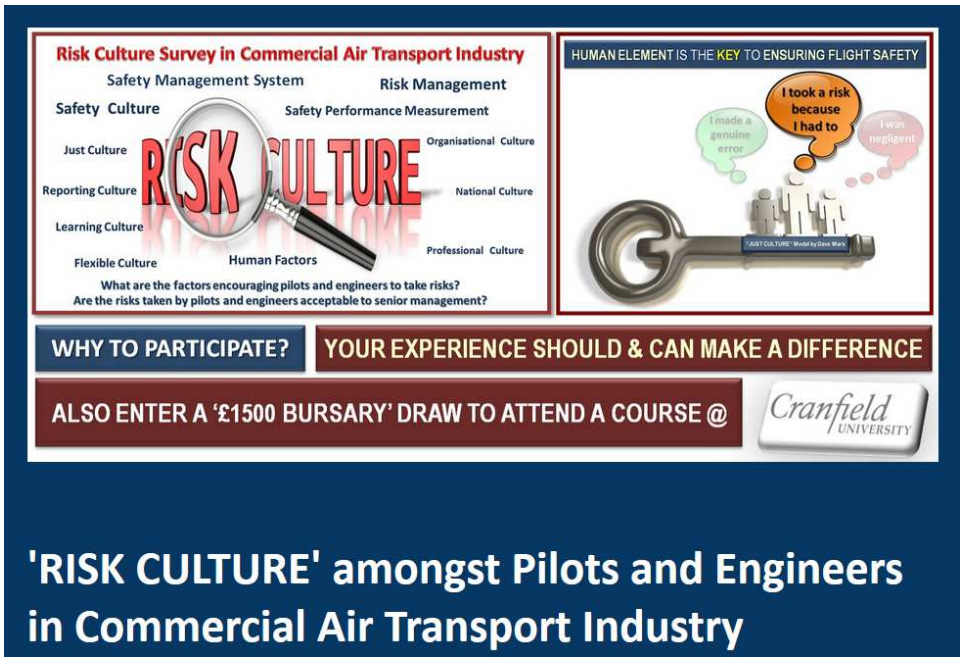
PHASE 1: INDUSTRY-WIDE SURVEY



www.riskculture.org

email@riskculture.org

Questionnaire (April to July 2016)



PHASE 2: MULTIPLE CASE STUDIES

THE ANALYSIS OF DATA FROM PHASE 1

The Phase 1 data will enable to design case studies to suit the profile of the participating organisations.

PARTICIPATING ORGANISATIONS

2 Large International Airlines based in the Far East

1 Large Airline/MRO organisation in the UK

1 Large Airline/MRO organisation in Europe

Potentially up to another 10 different airlines & MRO organisations in EU, Middle East/Turkey

PLEASE CONTACT IF YOU WISH TO PARTICIPATE

POTENTIAL OUTCOMES OF THE STUDY

PROACTIVE HAZARD IDENTIFICATION

This rather simple but potentially beneficial concept/methodology may identify some hazards which may not be reported through the usual reporting processes such as 'occurrence and/or hazard reporting'

It may also identify 'excessive risk taking' attitude/practices amongst the frontline operators

Finally it may also identify some systemic issues driving people to take risks.

POTENTIAL OUTCOMES OF THE STUDY

ENABLE MANAGEMENT TO EMPATHISE WITH FRONTLINE OPERATORS

By identifying such issues, perhaps the top management can understand the challenges front line operators face.

PROACTIVE IMPLEMENTATION OF 'JUST CULTURE'

Ultimately this approach may prevent situations that front line operators or even their managers take some level of risk, which resulted with a bad outcome and subsequently a disciplinary action was taken as part of just culture policy. Because in many cases, the adverse effect of a disciplinary action on 'reporting culture' is inevitable and it may take a long time to regain the trust of front line operators.

POTENTIAL ACTIONS TO BE TAKEN

Some accepted risks by front line operators or their line managers may not be acceptable to senior/top management. In this case, communication to clarify 'what's acceptable' and 'what's not' may be a simple solution so that the front line operators have the assurance.

PROACTIVE IMPLEMENTATION OF JUST CULTURE

Investigating some systemic causal factors may require policy changes or even investment decisions to be made.

THANK YOU

FOR YOUR ATTENTION!