

Safety/Just culture & Accident investigation MENA SASI - SEMINAR

Aviation Safety Perspectives, safety lessons learnt &
aviation/investigation future technology

Session 2 - Safety Management Systems

**A Near Miss
Not Reported
Is The Next Accident**



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SMS Approach

Accident causation & system

- **Phase 1:** common cause (Technology, Human & Organizational)
- **Phase 2:** via SMS addressing Tech, Process and Org issues
- **Phase 3:** it depends on the effectiveness of compliance & SMS success to identify unique cause.

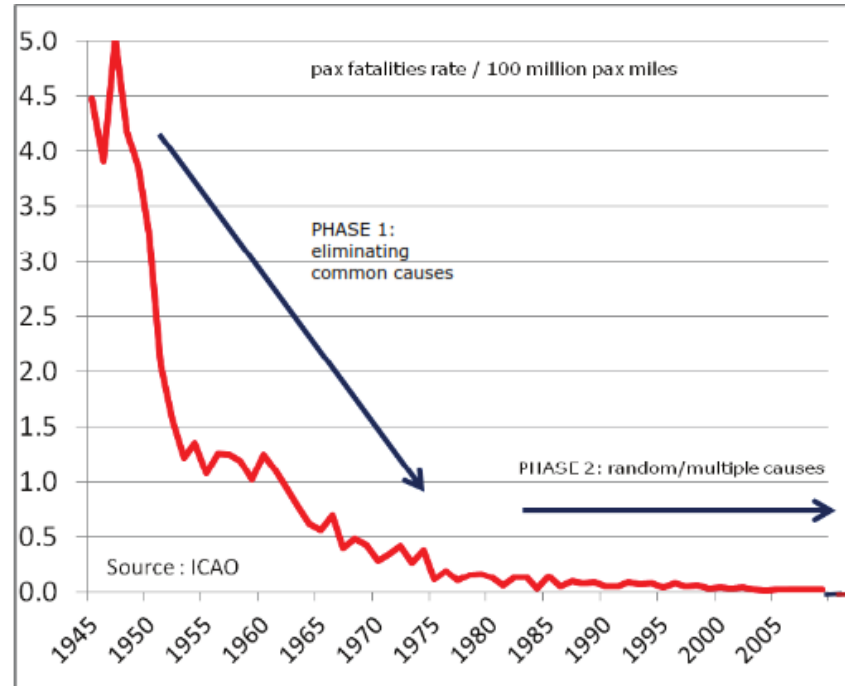
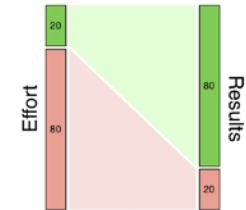


Figure 1. Accident Trends and Causes

The 80-20 Rule

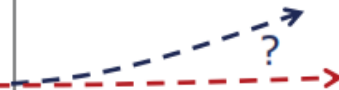
"For many events, roughly 80% of the effects come from 20% of the causes." - Pareto



Therefore 20% of the effort produces 80% of the results but the last 20% of the results consumes 80% of the effort.

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PHASE 3:
system failure or further
improvement



SMS & Regulations (Dr. Sparrow)

Implementing SMS is it a matter to comply to SMS requirements?

- SMS process is a subject of regulation but specific threats and hazards addressed via the SMS process are not themselves subject of regulations.
- Need SMS to capture what ever possible non compliance to the established regulation; and
- A SMS to be tailored for identification of unique causes within the system that are not subject of prescriptive regulations.

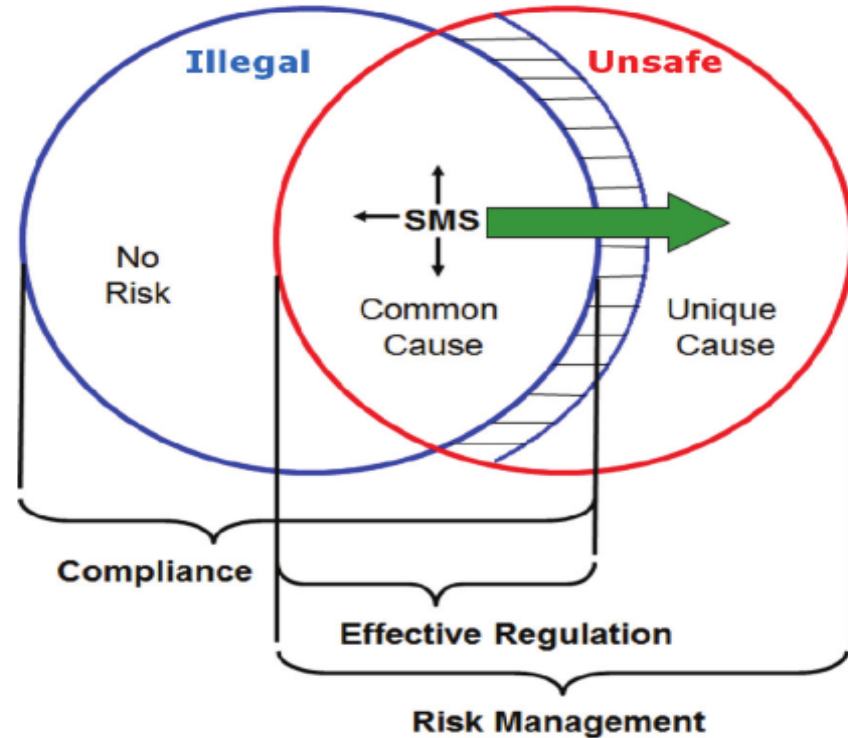


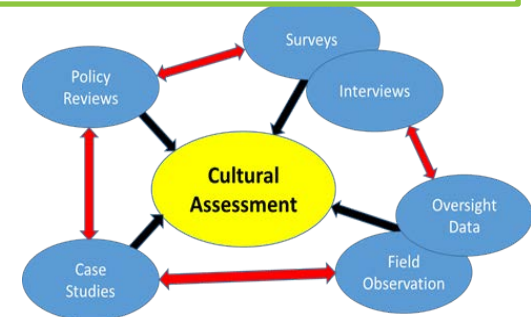
Figure 2. Relationship between Regulatory Requirements and Risk

Several Models safety culture



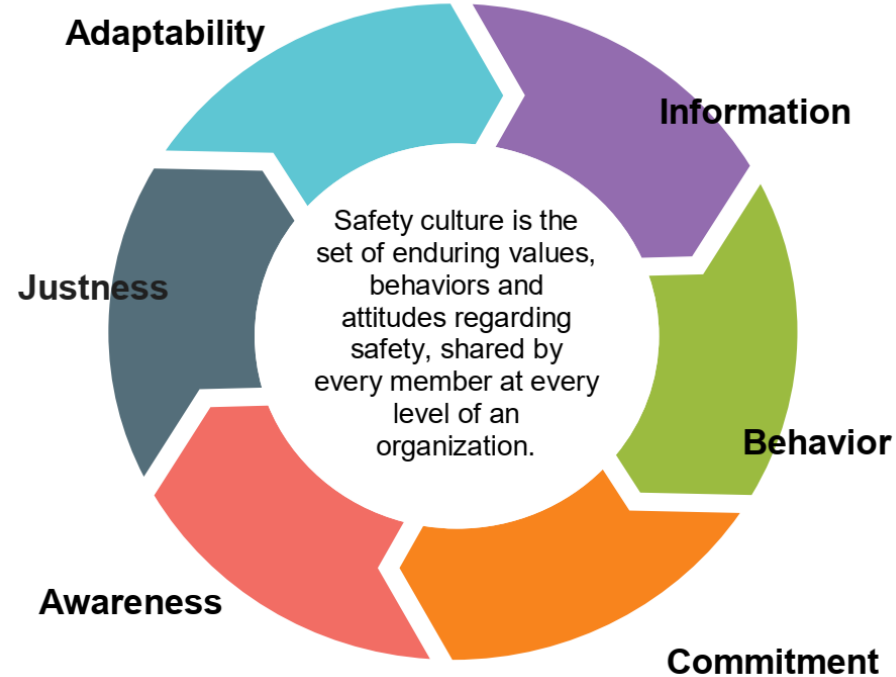
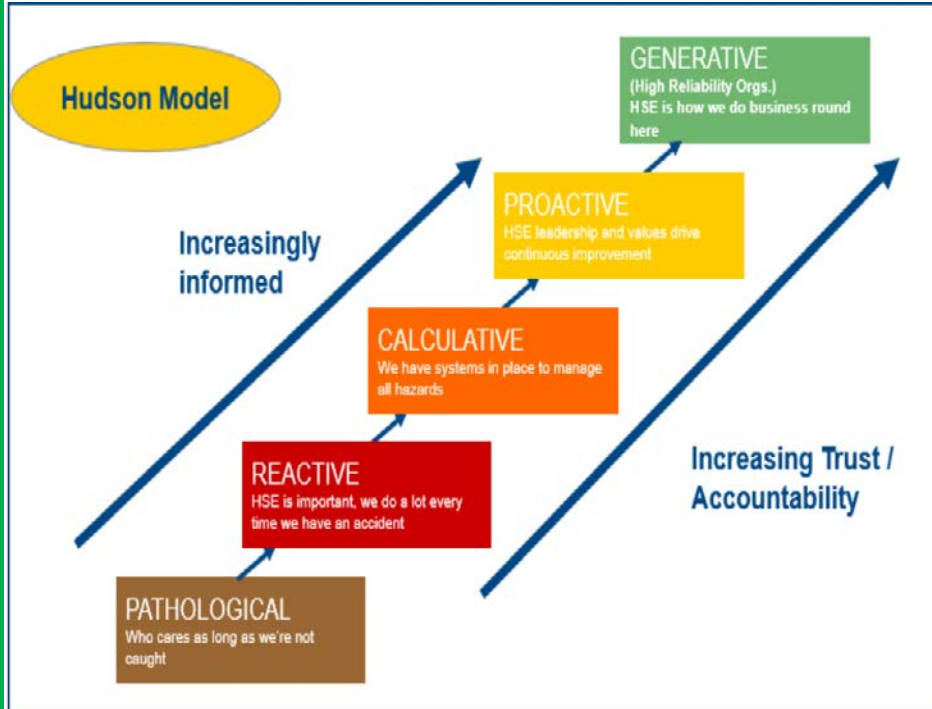
➤ Safety culture definitions:

- ❑ as the set of enduring **values**, **behaviours** and **attitudes** regarding safety, **shared** by **every member** at **every level** of an organization
- ❑ is the product of the **individual** and **group values**, **attitudes**, **perceptions**, **competencies** and **patterns** of **behaviour** that determine the **commitment** to, and the style and proficiency of, an organisation's safety management
- ❑ how an organization **behaves** in relation to safety and risk when **no one is watching"**



Safety culture Model

Implementing SMS is it a matter to comply to SMS requirements?



Safety Culture Evaluation Tools Industry



SAMPLE SUMMARY SHEET

Organisation Assessed		Reactive	Calculative	Proactive	Reactive	Calculative	Proactive
Characteristic	Question	Management			Workforce		
Commitment	CoM01/CoW01: Personal commitment to safety		X		X		
	CoM02/CoW02: Safety triggers			X	X		
	CoM03/CoW03: Management assurance of safety	X			X		
	CoM04/CoW04: Workforce attitude towards safety		X				X
	CoM05: Financing of safety			X			
	CoW05: Dealing with unsafe operations or activities						X
	Overall assessment of commitment						
Justness	JuM01/JuW01: Recognition of safe behavior						
	JuM02/JuW02: Dealing with unsafe behavior						
	JuM03/JuW03: Safety investigations						
	JuM04/JuW04: Organizational contributing factors						
	Overall assessment of justness						
Behavior with Respect to Safety	BeM01/BeW01: Communication safety issues						
	BeM03/BeW03: Support from colleagues						
	Overall assessment of behavior						
Overall safety culture estimate:							
Overall confidence level in the safety culture		V Low	Low	Medium	High	V High	
Summary comments:							
Signature and Date:							

Characteristic	Indicators
Commitment to Safety	<ul style="list-style-type: none"> Management commitment Personal commitment Investment in safety
Justness	<ul style="list-style-type: none"> Evaluation of (un)safe behavior Perception of evaluation Passing of responsibility
Information	<ul style="list-style-type: none"> Communication of safety-related information Safety reporting system Willingness to report Consequences of safety reports
Awareness	<ul style="list-style-type: none"> Awareness of job-induced risk Attitude towards unknown hazards Attention to safety
Adaptability	<ul style="list-style-type: none"> Actions after safety occurrences Proactiveness to prevent safety occurrences Employee input
Behavior with Respect to Safety	<ul style="list-style-type: none"> Working situation Employee behavior with regard to safety Mutual expectations and encouragement

Safety Culture Evaluation Tools Self-Assessment Tool Regulator



Evaluation of Regulator decision making process & Management

This survey can be used to provide a preliminary picture of the opinions and perceptions of an Authority's workforce. It should be used in combination with other assessment methods to validate the results and to clarify areas of interest. For further information, see Appendix 2 of this document.

1. The Authority considers the effects their decisions have on service providers' safety

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

2. Different Authority inspectors draw the same conclusions from the same facts

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree



34. The Authority's management is in close touch with its employees

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

35. The Authority's employees eagerly express safety concerns

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

36. The Authority's inspectors do not apply personal prejudice when performing oversight activities

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

37. The Authority's decisions are not driven by pressures of public opinion

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

38. The Authority does not blame its employees for honest mistakes

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

39. The Authority does consider individual and organizational factors when investigating internal problems

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

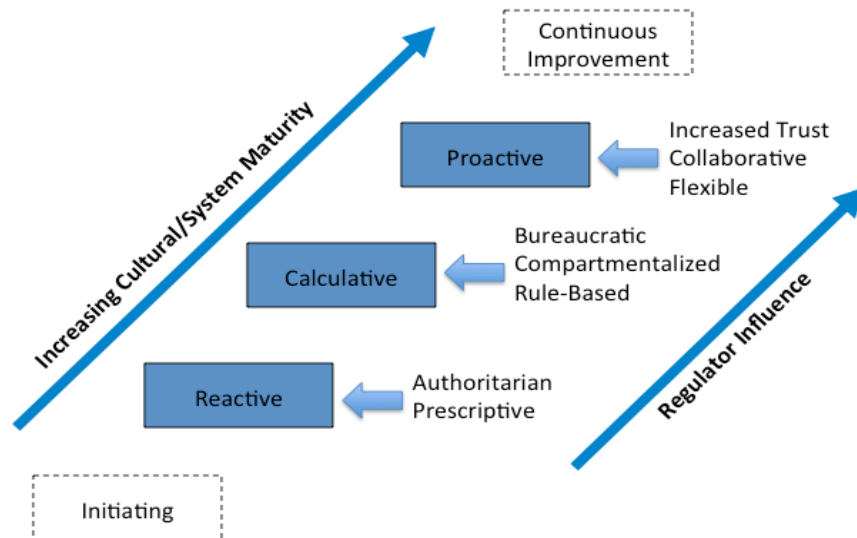
40. The Authority does not accept work arounds from its employees

Fully disagree ☐ ☐ ☐ ☐ ☐ ☐ Fully agree

Any additional thoughts/comments?

☐

Adaptation to service providers maturity level



➤ Safety Culture & SMS in Ireland (Doc ASA/03/11 of 2011)

- ☐ Overview of the maturity of safety culture throughout the whole aviation sector.
- ☐ Measure and consequently manage the overall safety process
- ☐ Identify areas of strength and areas needing development

Expected analysis result:

Part 1:

Count of Q3:	Q3:	General
Function/Role	Female	Male
Administration	2	1
ATCO	2	1
Engineering	2	1
Flight	2	1
Ground Handling	2	1
Maintenance	2	1
Other	2	1
Training	2	1
Grand Total	13	6

Q3. The safety policy statement is an accurate reflection of the company's commitment to safety. In total 75% of respondents agreed or strongly agreed with this statement. Maintenance part M subpart G/H and ground handling were the categories who replied with the highest level of disagreement 3 out of 13 and 3 out of 14 respondents respectively.

Part 2:

Count of Q3:	Q3:	General
Function/Role	Female	Male
Administration	2	1
ATCO	2	1
Engineering	2	1
Flight	2	1
Ground Handling	2	1
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Part 3:

General (Free-Text) Comments

Many respondents expressed concern that their organisations are more focused on the.....

survey consists of 3 sections as following:

1. Collection of demographic information
2. key aspects of safety culture
3. open text box

SSP & Safety Culture

Safety

SSP component 1
State safety policy,
objectives and
resources

CE-1 Primary
aviation legislation

CE-3 State system
and function

CE-5 Technical
guidance, tools and
provisions of safety
critical information

CE-2 Specific
operating regulations

CE-4 Qualified
technical personnel

SSP component 2
State safety risk
management

CE-6 Licensing
certification,
authorization and/or
approval obligations

Accident and incident
investigation

Management of
safety risks

Safety management
system obligations

Hazard identification
and safety risk
assessment

CE-8 Resolution
of safety issues

SSP component 3
State safety
assurance

CE-7 Surveillance obligations

State safety performance

SSP component 4
State safety
promotion

Internal communication and
dissemination of safety
information

External communication and
dissemination of safety
information

Civil Aviation
System and
Description

CE-3 State
function

NASP

Safety
Intelligence

Monitor
SP Safety

Management of
Change

Culture

Safety Management & Safety culture



Safety Management components	Safety culture Characteristics
Safety Policy	Commitment to Safety
Safety Risk Management	Justness Information Awareness
Safety Assurance	Adaptability
Safety Policy	Behaviour with Respect to Safety

➤ **Correlation** between SMS (System) and Safety culture (concept):

❑ Correlation: (Accident/incident rate) # Maturity level

(Neal and Griffin (2006), Grabowski et al. (2010), Morrow et al. (2014)

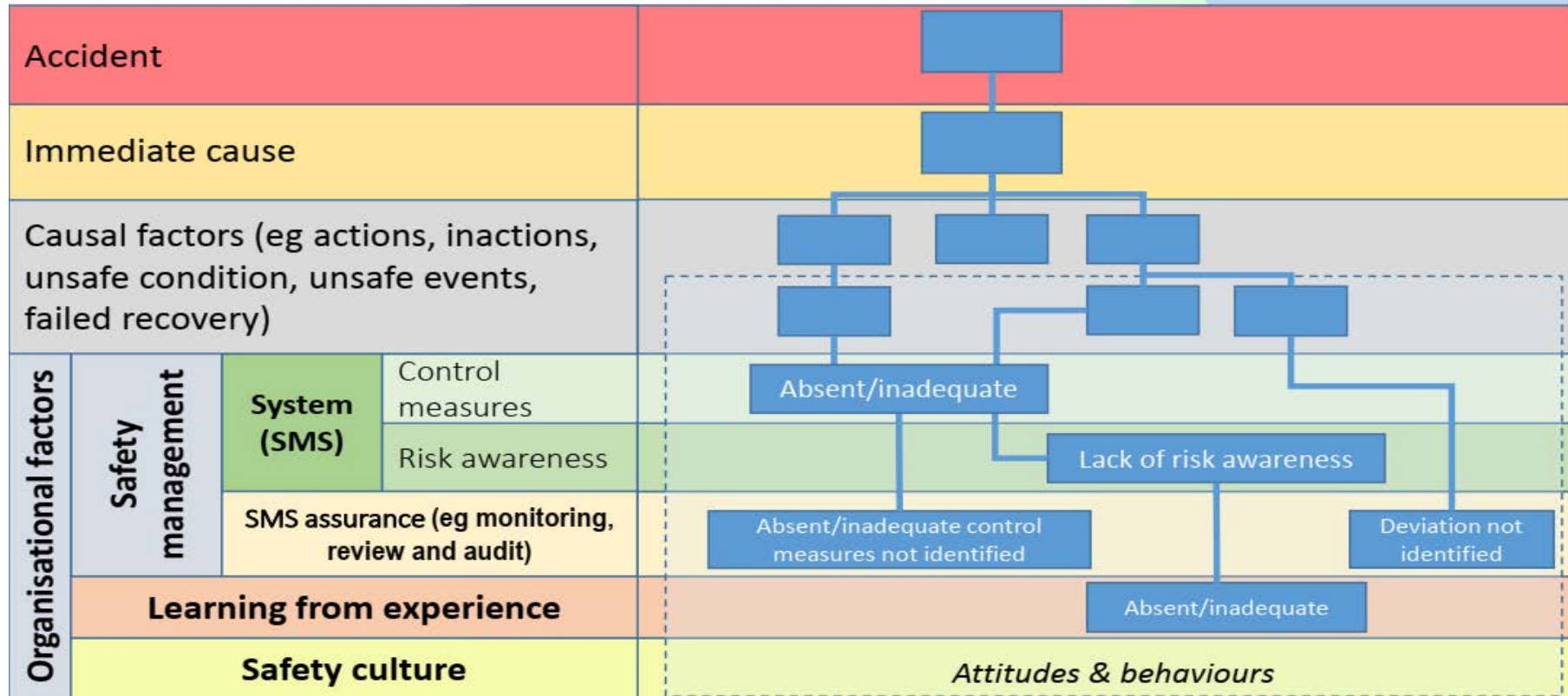
➤ But **absence of accidents** doesn't ensure **mature** safety management

Safety culture and accident investigation



- Barry Strauch from NTSB US article – (Safety Science of 2015)
 - ☐ Shortcomings in measuring safety culture through questionnaires [\[Nuclear Regulatory Commission \(2011\)\]](#)
 - ☐ Ethnographic methods require more time to conduct a study than is reasonably available to investigators
 - ☐ **Big opportunity** to gather considerable data in **accident investigations on safety culture** than could be obtained prior to accident in direct assessments.
 - ☐ Via the following methodology.....

Understanding organizational factors



4 step process

to identify organizational factors in an accident investigation

1. ESTABLISH FACTORS THAT ARE

a. Identifiable

b. Assessable

2. DETERMINE IF THESE ARE ORGANIZATIONAL FACTORS

a. Unintended deviations from organizational expectations

b. Multiple individuals acting in their organizational roles

c. Created by organizational conditions

3. RELATE THESE FACTORS TO THE CAUSE OF THE ACCIDENT

a. Would the organizational errors have occurred if the company had responded differently

b. Would the accident have occurred in the absence of these errors

4. DETERMINE WHETHER THE ORGANIZATION IS RESPONSIBLE

a. Acting/deciding contrary to available information

b. Acting/deciding contrary to self-evident information

c. Failing to act/decide when warranted

Just Culture & Accident investigation



- Just Culture reinforce the reporting system and helps to identify of trends that allow addressing Latent factors
- Increase in reported event is not indicative of decrease of safety and vis versa → look to severity rather than Frequency
- Tool (distinguishing between error/ violation)

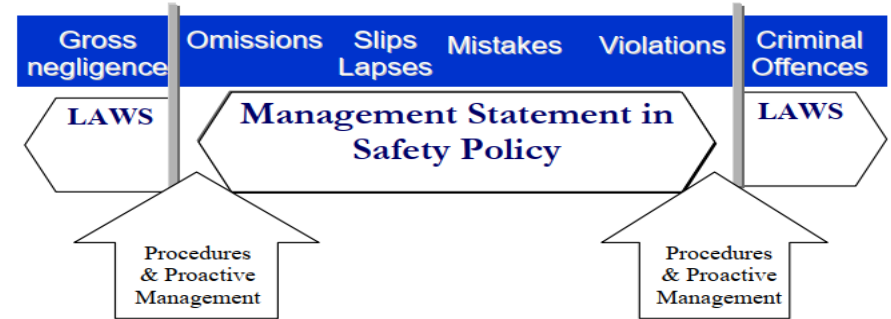


Figure 2. Defining the borders of “bad behaviours” (From P. Stastny Sixth GAIN World Conference, Rome, 18-19 June, 2002)

Just Culture Tools

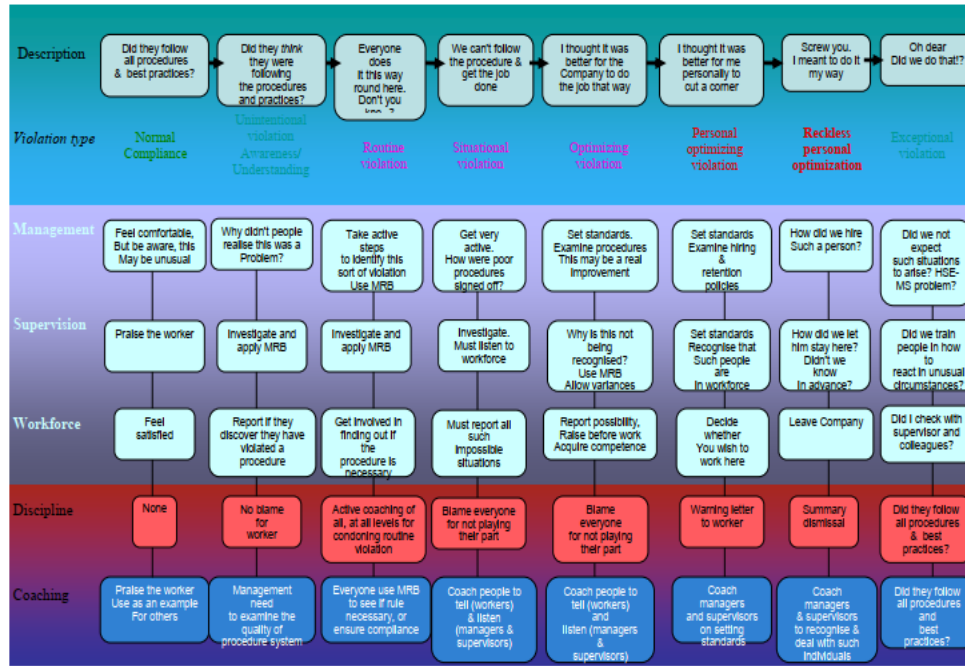
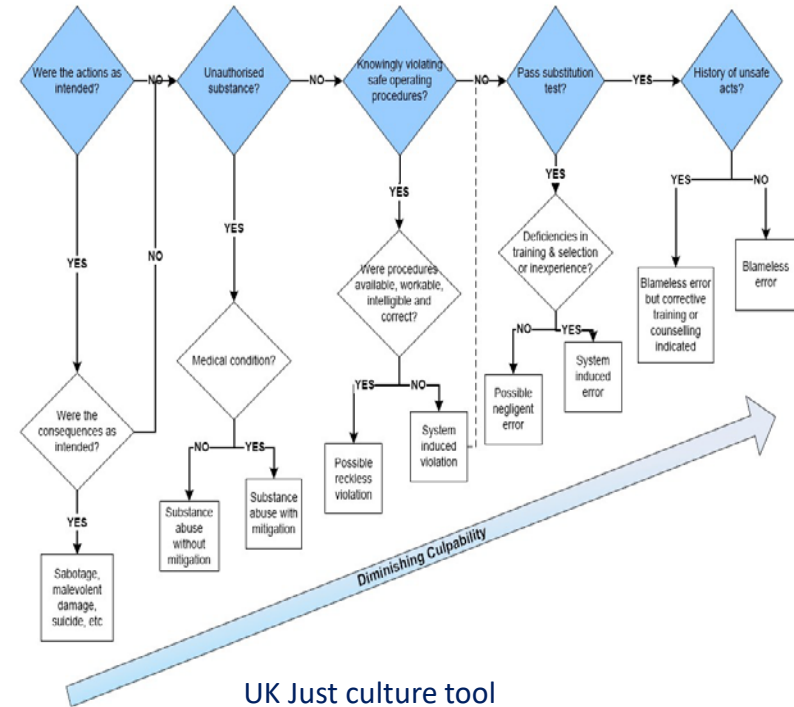


Figure 4. Hudson's refined Just Culture Model (From the Shell "Hearts and Minds" Project, 2004)

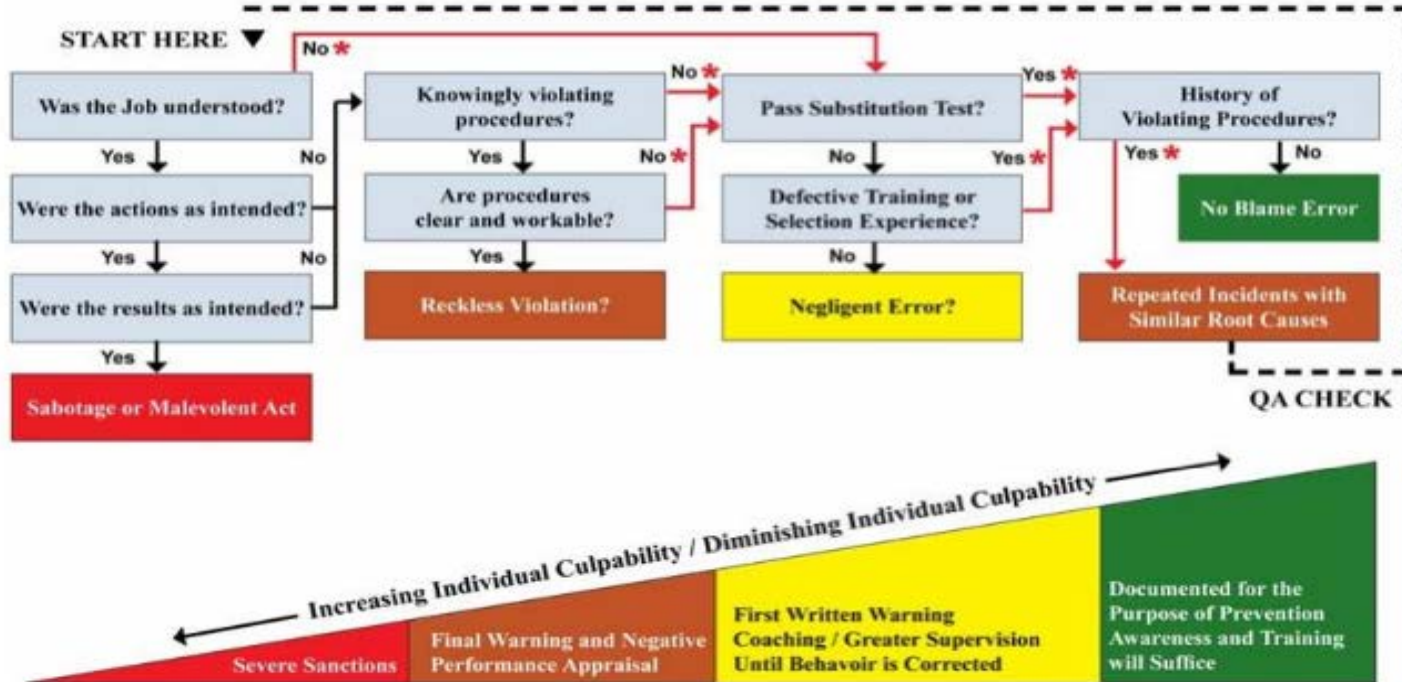


UK Just culture tool

Just Culture Tools



'Just Culture' Decision Tree



★ Indicates a "System" induced error. Manager/Supervisor must evaluate what part of the system failed, and what Corrective and Preventative Action is required.

- We need to evolve to safety Management **effectiveness** to maintain/improve the accident trend.
- **Maturity** of Safety Culture might be taken as an evidence of an effective SMS
- Big opportunity to **gather considerable** data on safety culture in **accident investigations** than could be obtained during normal operations
- CAAs & especially AIBs are invited to actively use the available **safety culture evaluation tools** to identify their level, areas of weaknesses & strengths
- Using **Just culture (tool)** rather than blame culture would create thrust and Safe environment which will serve the safe and secure air transport.

Questions?