

*Safety culture in Aviation companies.....*

*Briefing about the implementation process and benefit of a*

# Safety and Quality Management System SQMS



© J. Wirths

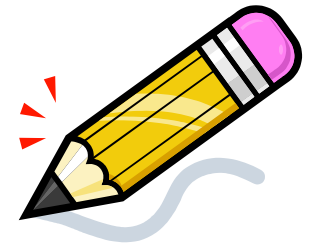
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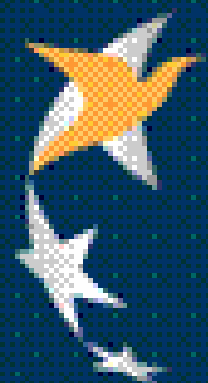
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# CONTENTS:

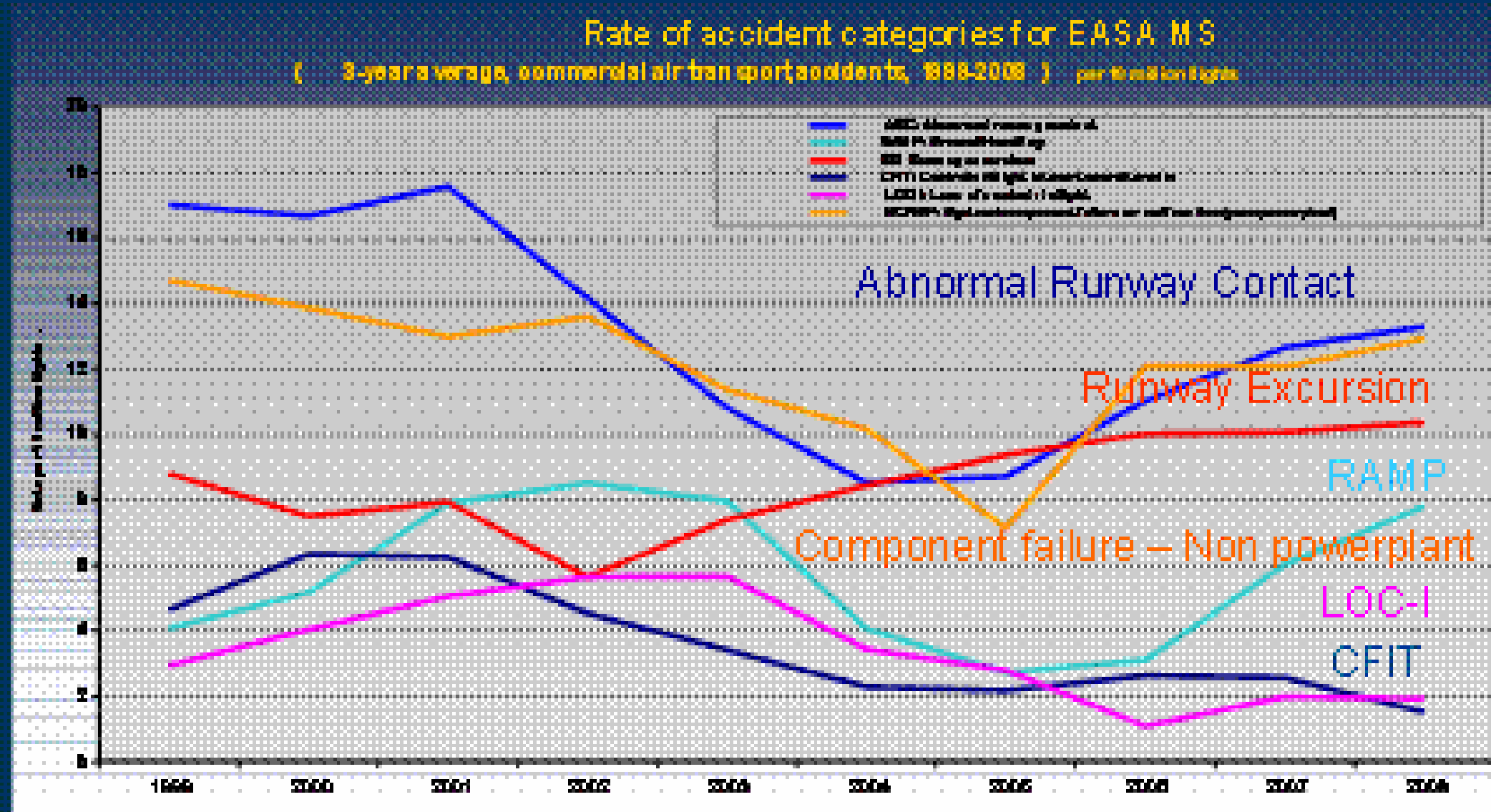
- ▶ Present observed status of Q-Systems
- ▶ Presentation > SQMS Model....
- ▶ Information release relating to the present SQMS implementation plan from AUSTRO CONTROL
- ▶ *Outlook and route map to develop the SQMS system together.....*





European Aviation Safety Agency

# Rate of accident categories



19 June 2009

Safety in 2008 – Briefing to EASA staff

5

ARC +

RE +

CF +

RAMP +

LOC +

CFIT -

# Present Status and Problems of Implementation:

- ▶ In practise, Q-Systems (too often)...
- ▶ are **delegated** to the (external) Q-Manager
- ▶ are considered as a **burden**
- ▶ have a low **level of acceptance** on management AND employee level
- ▶ are **not integrated** in the general management activities
- ▶ are focused on satisfying the **Authority**
- ▶ consist of **redundancies / contradictions** with other JAR- / EASA relevant documents
- ▶ → **do not provide any benefit** to the company
- ▶ ...



## ***SET UP PHASE***

- ▶ 1 Customer Information and Briefing
- ▶ 2 Providing a Compliance List to Customer
- ▶ 3 Providing of Guidance Material to Customer

## ***IMPLEMENTING PHASE***

- ▶ 4 Via Workshop's and close contacts to companies
- ▶ 5 Standardization

## ***DEVELOPING PHASE***

- ▶ 6 SMS will become established in 2009 /10
- ▶ 7 Further developing of the System as a living system



# Relevant Legal Requirements:

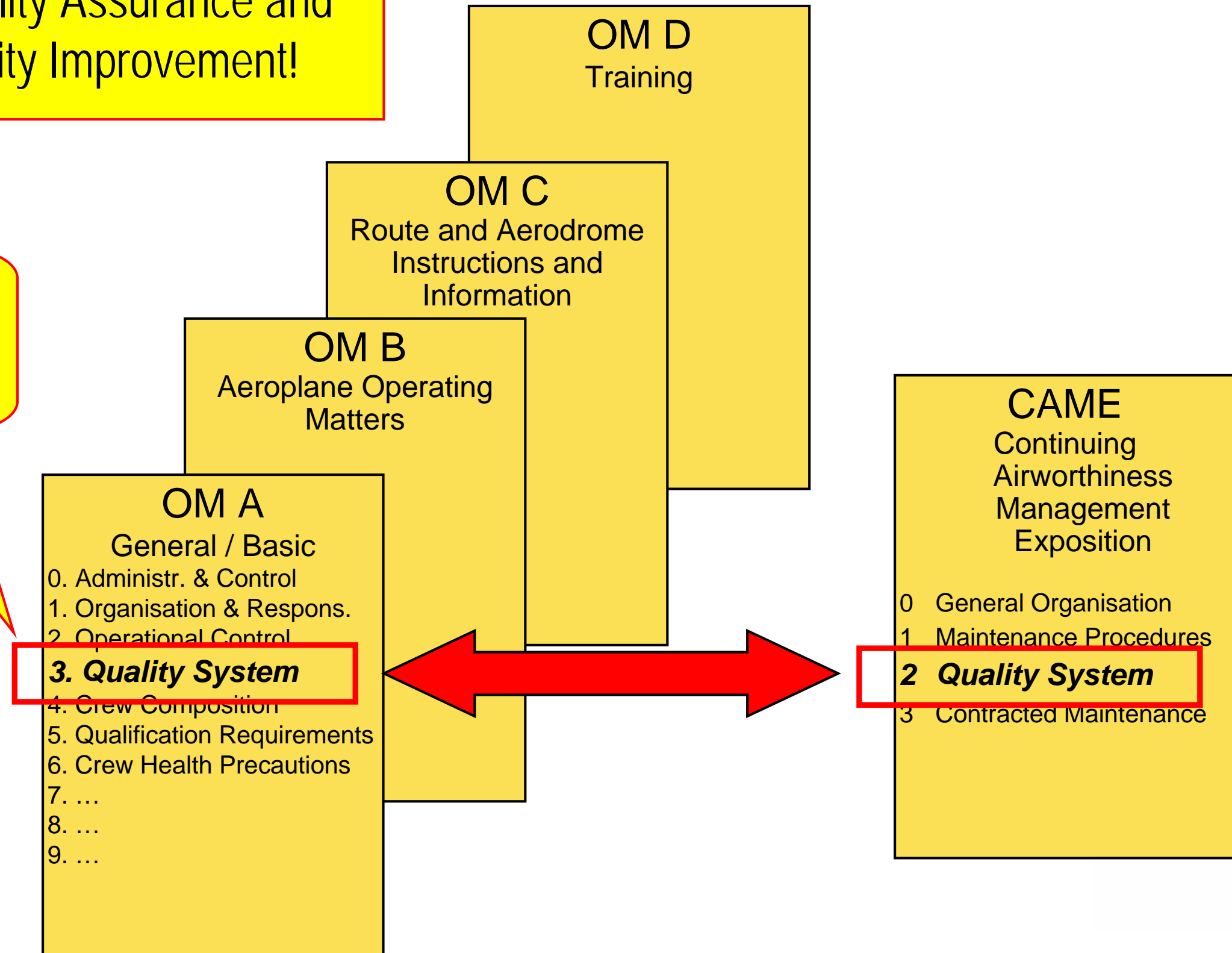
- ▶ Regulation (EC) No 1899/2006 Annex III OPS 1.035
  - **“An OPERATOR shall establish one Quality System ... to ensure safe operational practices and airworthy aircraft.”**
- ▶ Regulation (EC) No 1899/2006 Annex III OPS 1.037
  - **“An OPERATOR shall establish and maintain an accident prevention and flight safety programme, which may be integrated in the Quality System.”**
- ▶ Regulation (EC) No 2042/2003 Annex I Part M.A.712 (a)
  - **“... the approved CONTINUING AIRWORTHINESS MANAGEMENT ORGANISATION ... shall establish a quality system and designate a quality manager ... to ensure airworthy aircraft.”**

# FACTS...

Quality Systems are limited  
to Quality Assurance and  
Quality Improvement!

Document Structure  
according to EU-OPS 1.1045

May be documented  
in a separate manual



# Relevant Legal Requirements

## Do we need several Q-Systems?

- ▶ EU OPS 1, EASA Part M, EASA Part 145, JAR-FCL 1 require that Q-Systems are implemented and maintained
- ▶ This leads NOT to different Systems!

(d) Where the approved continuing airworthiness management organisation is approved in accordance with another Part, the quality system may be combined with that required by the other Part.

(e) In case of commercial air transport the M.A. Subpart G quality system shall be an integrated part of the operator's Quality system.

# Standard

## ISO 9000 Family: Overview

ISO 9000

Quality Management Systems –  
Fundamentals and Vocabulary

ISO 9001

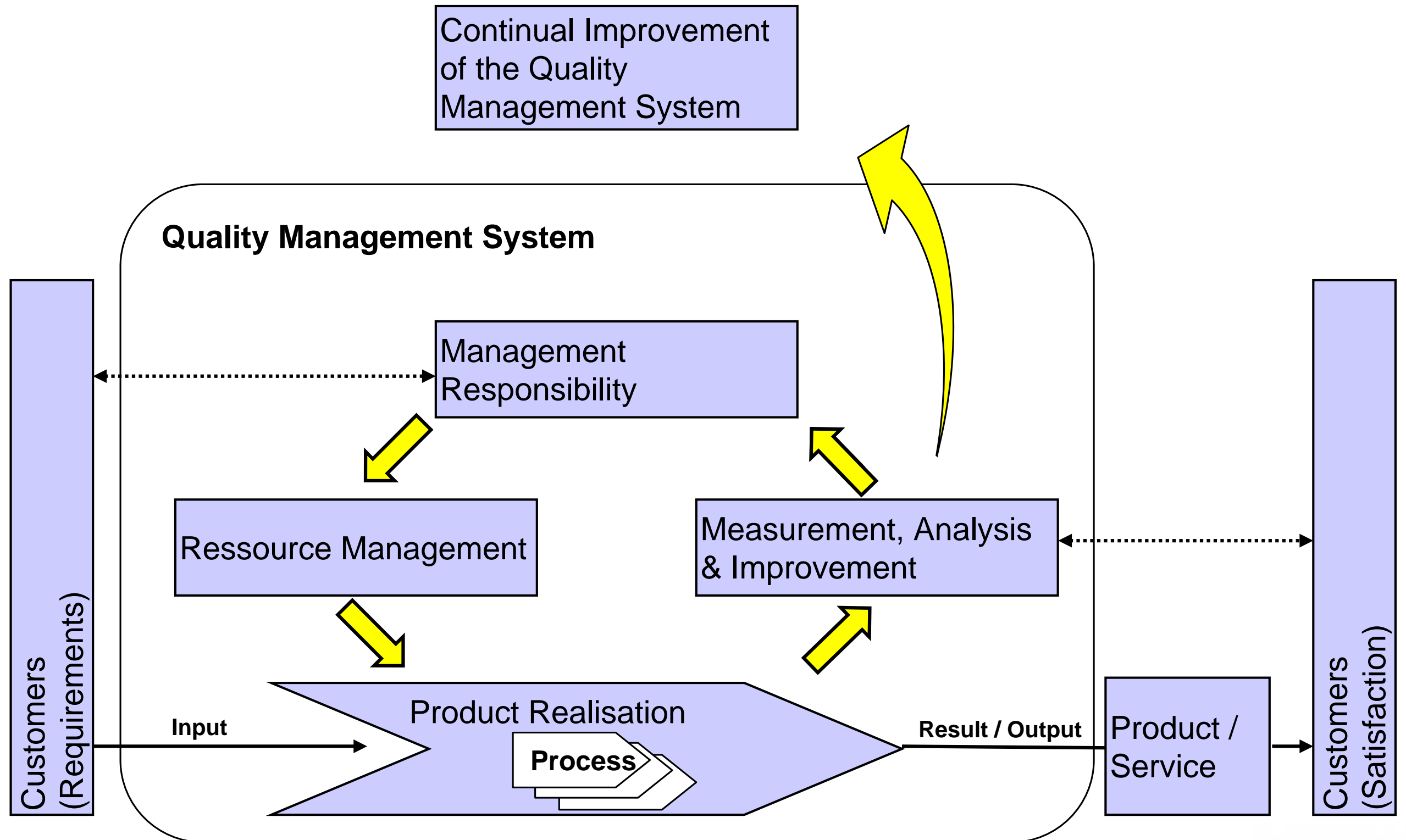
Quality Management Systems –  
Requirements



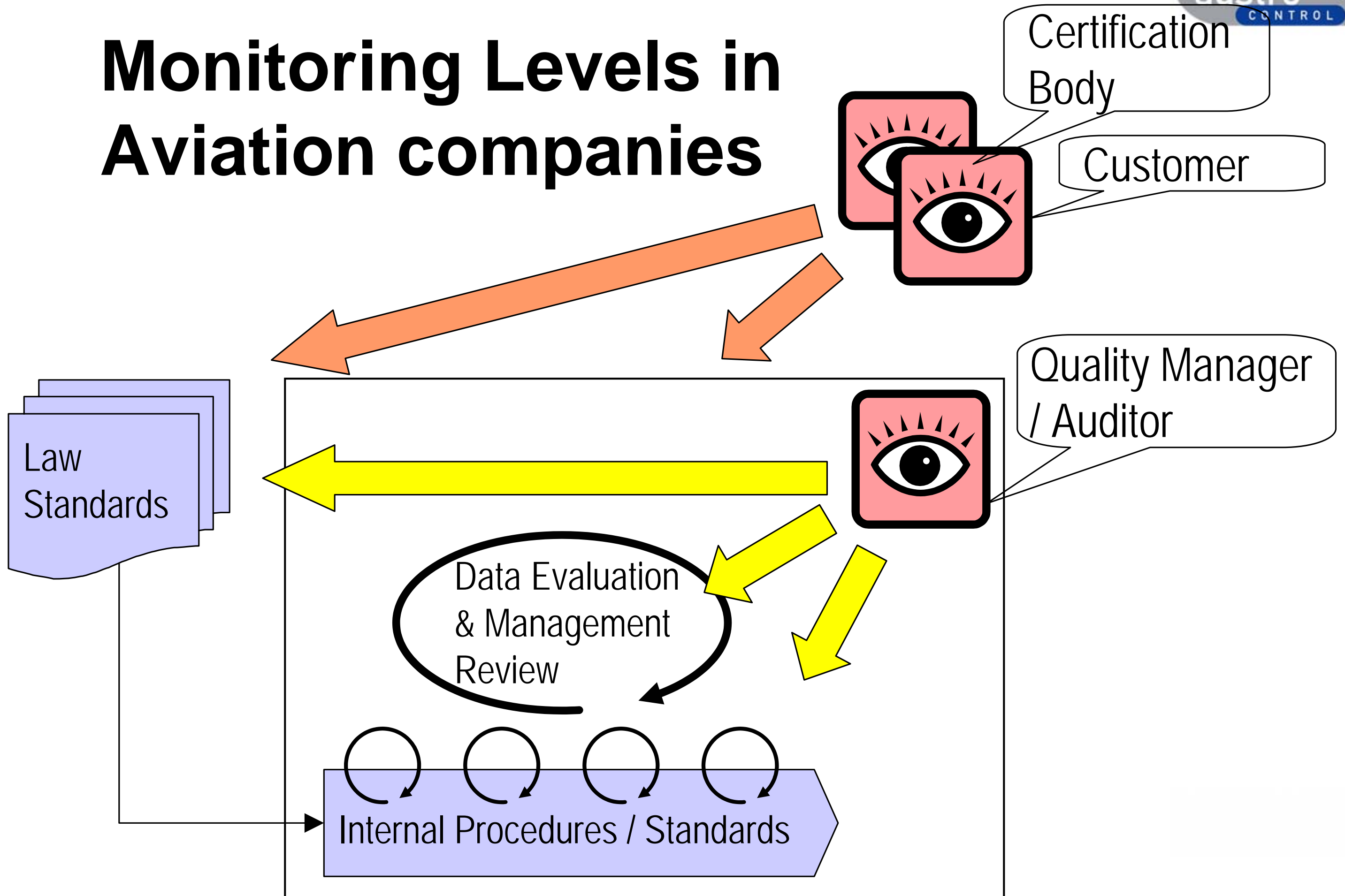
ISO 9004

Quality Management Systems –  
Guidelines for Performance Improvements

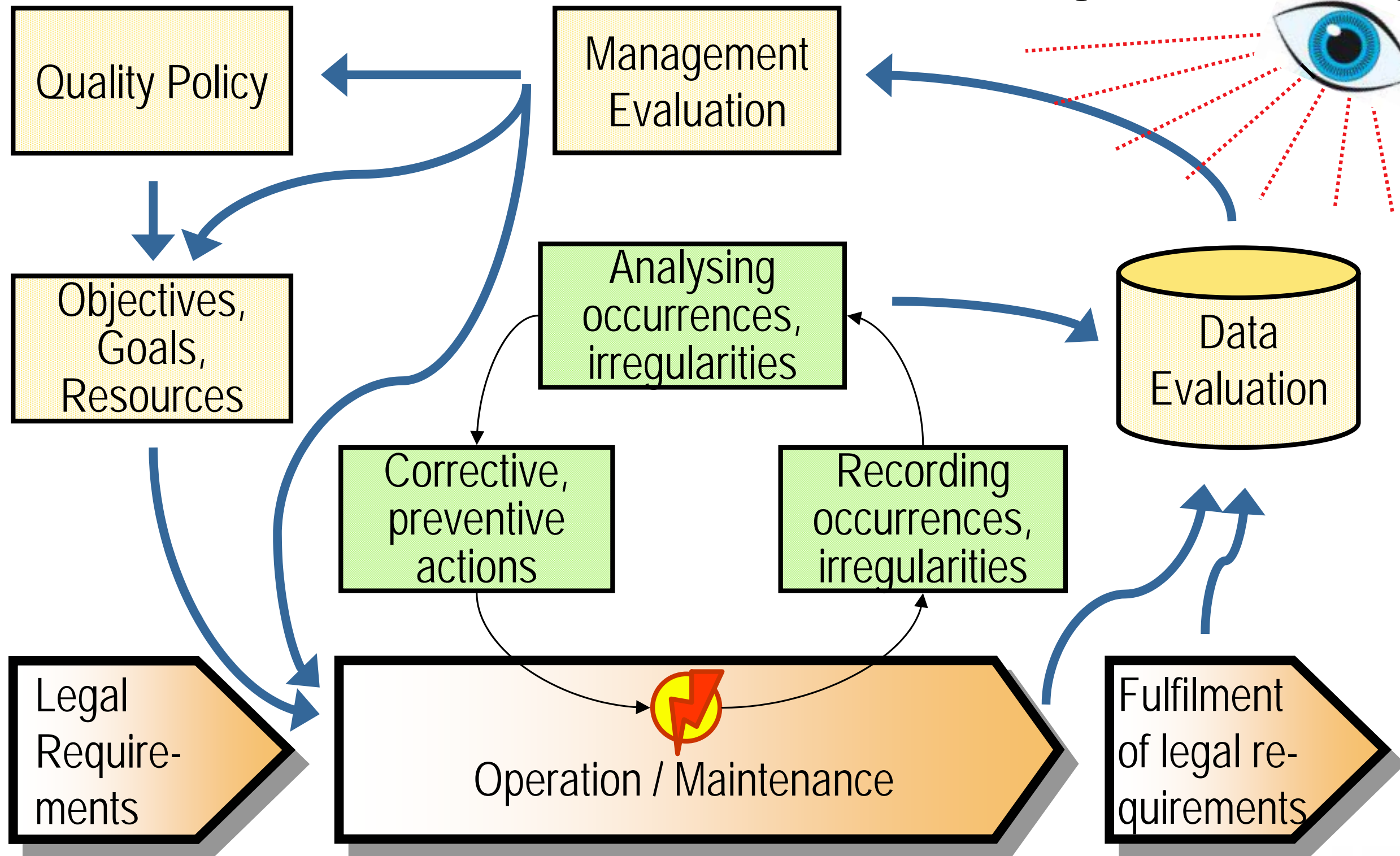
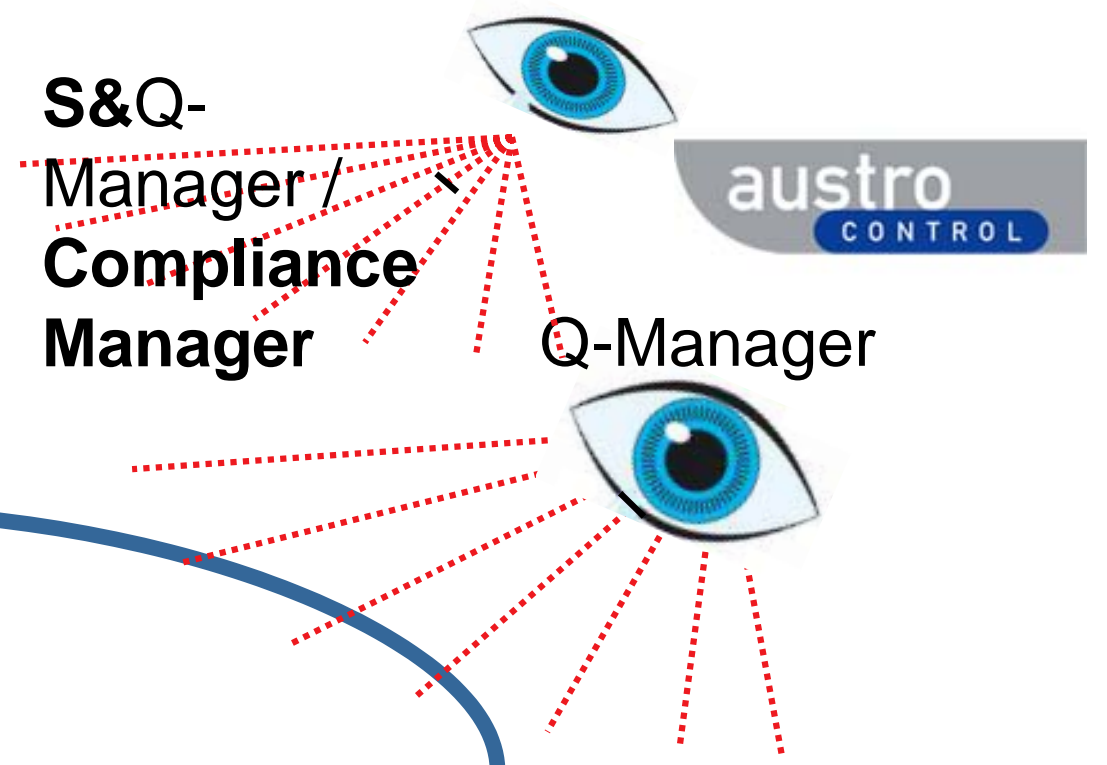
# ISO 9001: Revision 2008



# Monitoring Levels in Aviation companies

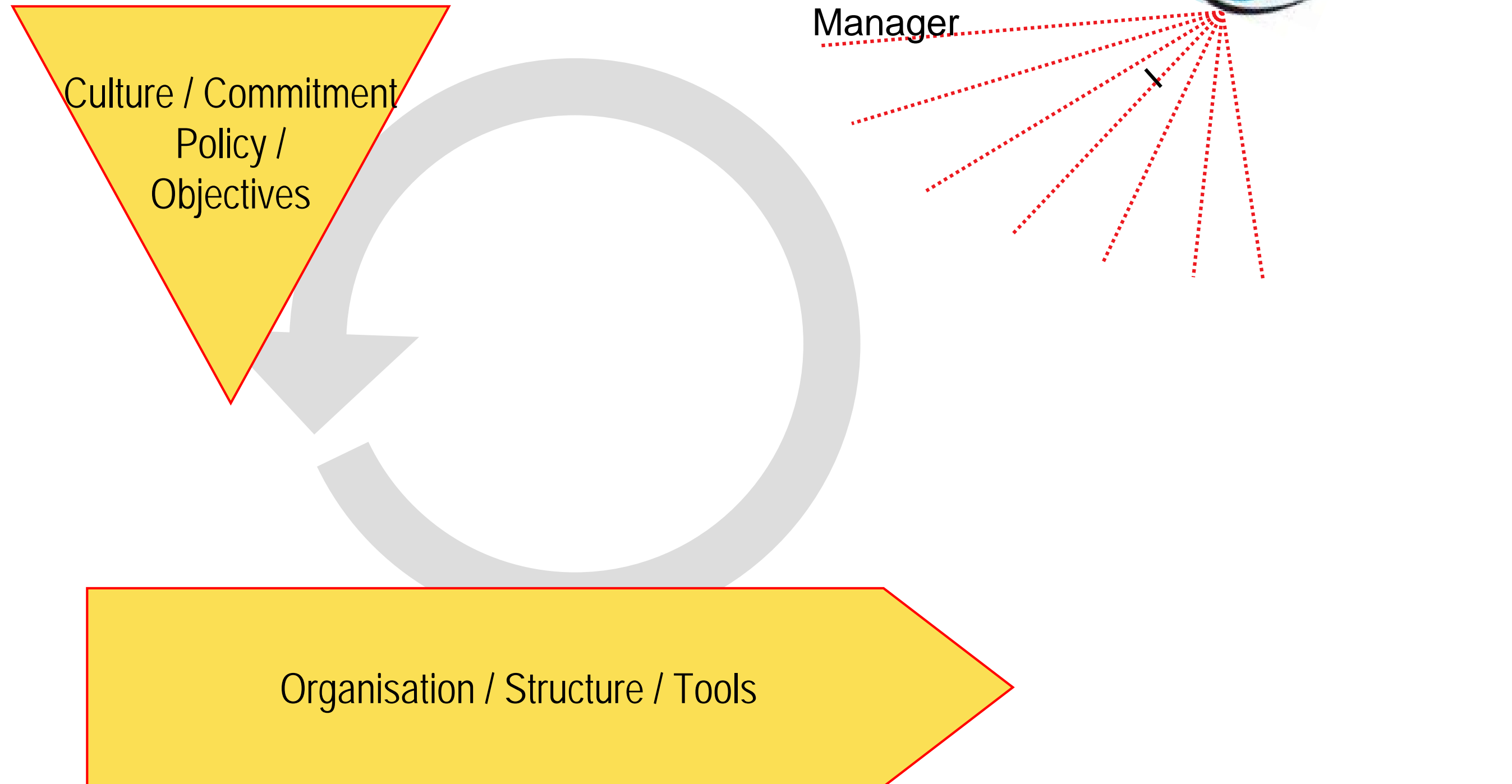


# Aviation Q-System



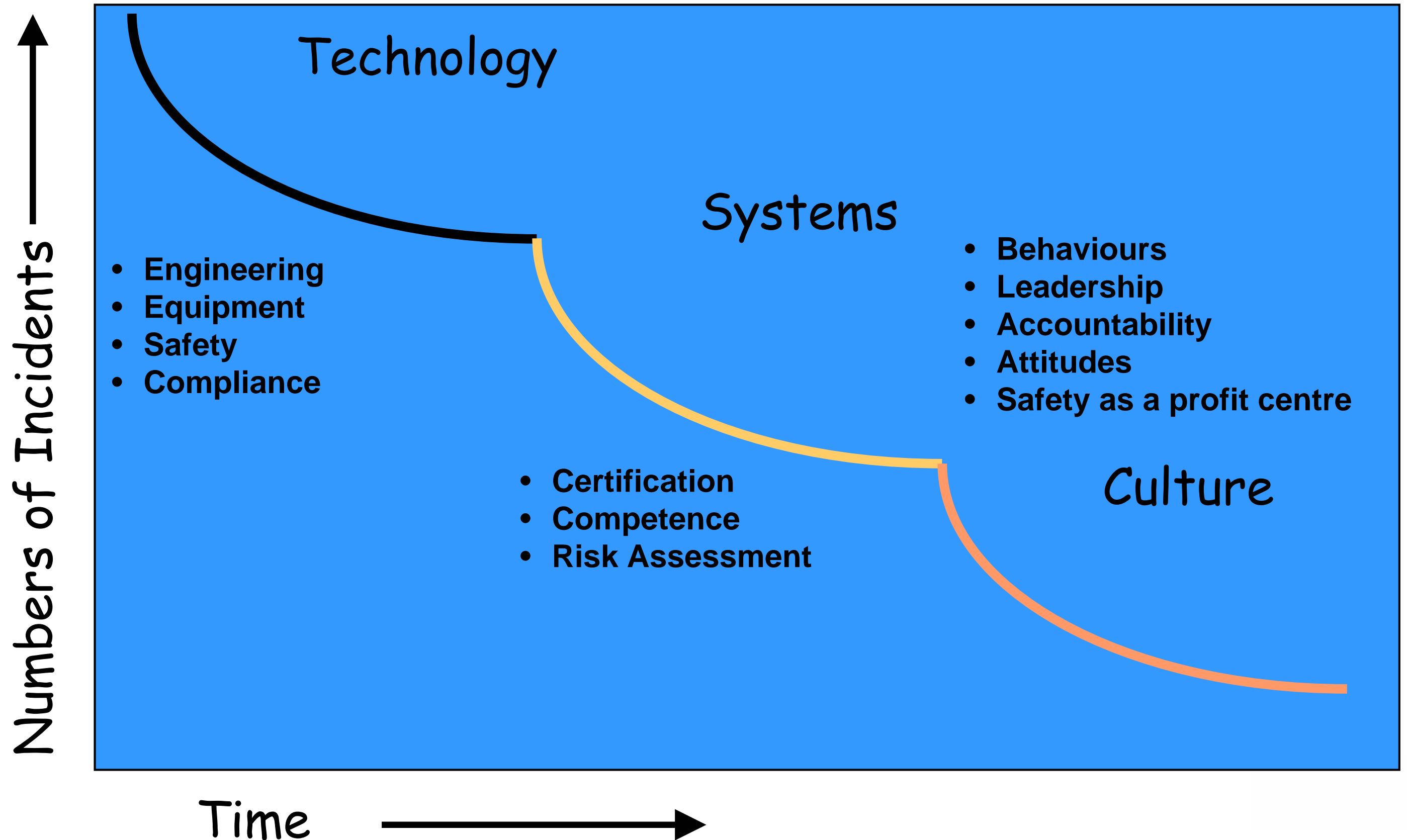
Occurrences, incidents, accidents, non-conformities, non-compliances, irregularities

# Cornerstones of Safety Management



Source: ICAO Safety Management Manual / Doc 9859 (2006) / § 5.3

# Evolution Safety Management (P.Hudson)



# POSITIVE CULTURE

**Just  
Culture**

**Informed  
Culture**

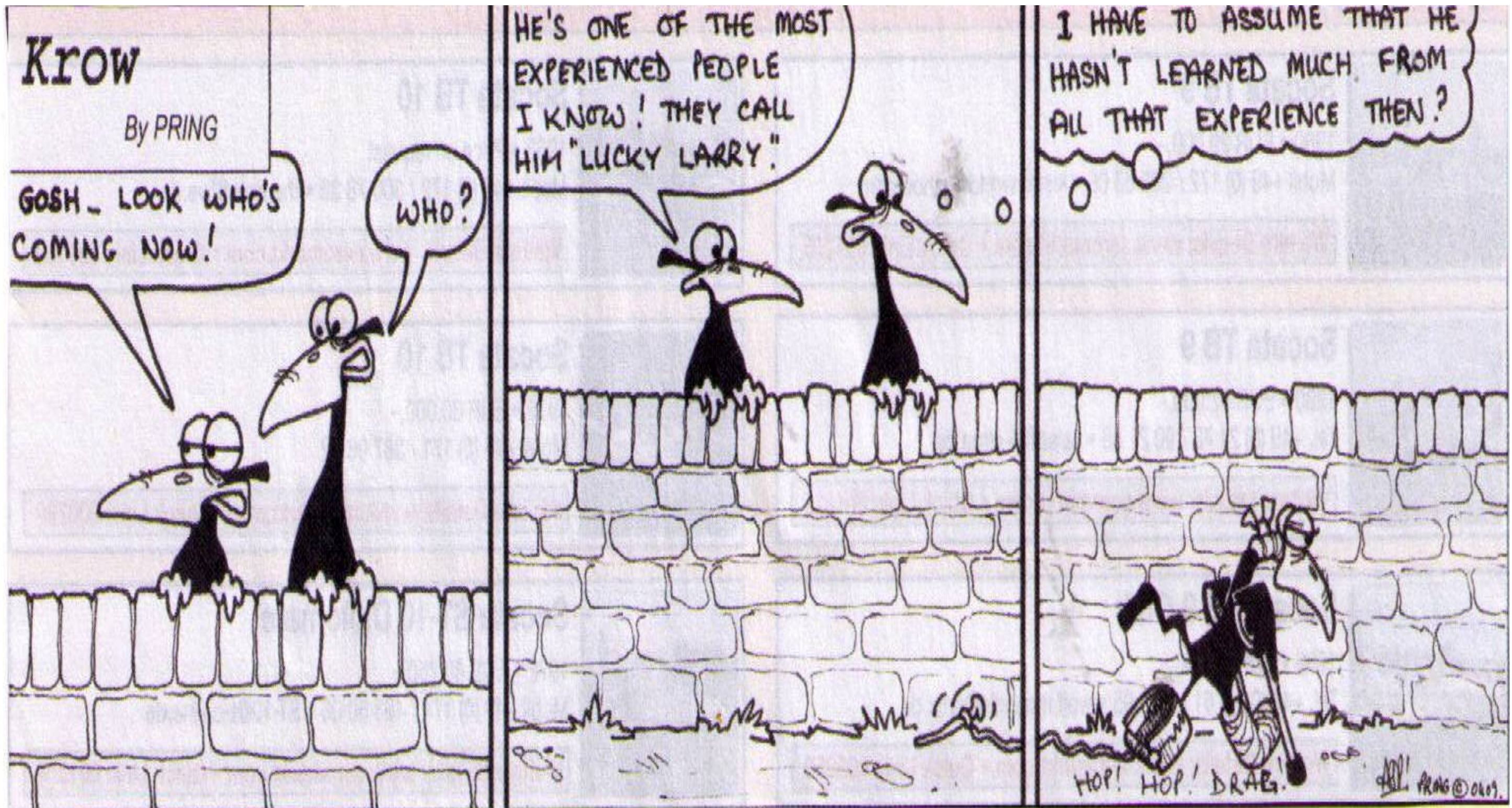
Aspects of a  
positive Culture

**Learning  
Culture**

**Reporting  
Culture**

**Flexible  
Culture**

Source: David Marx





## SAFETY CULTURE

### The Top-Level Definition is:

- ▶ Safety Culture is the set of enduring values and attitudes regarding safety, shared by every member of every level of an organization.



# ECAST

*Component of ESSI*

European Strategic Safety Initiative



# Safety

## Traditional approach – Accident prevention

- Focus on outcomes (probable cause)
- Unsafe acts by operational personnel
- Attach blame/punish for failures to “perform safely”
- Address identified safety concern exclusively
- Identifies:

**WHAT?**

**WHO?**

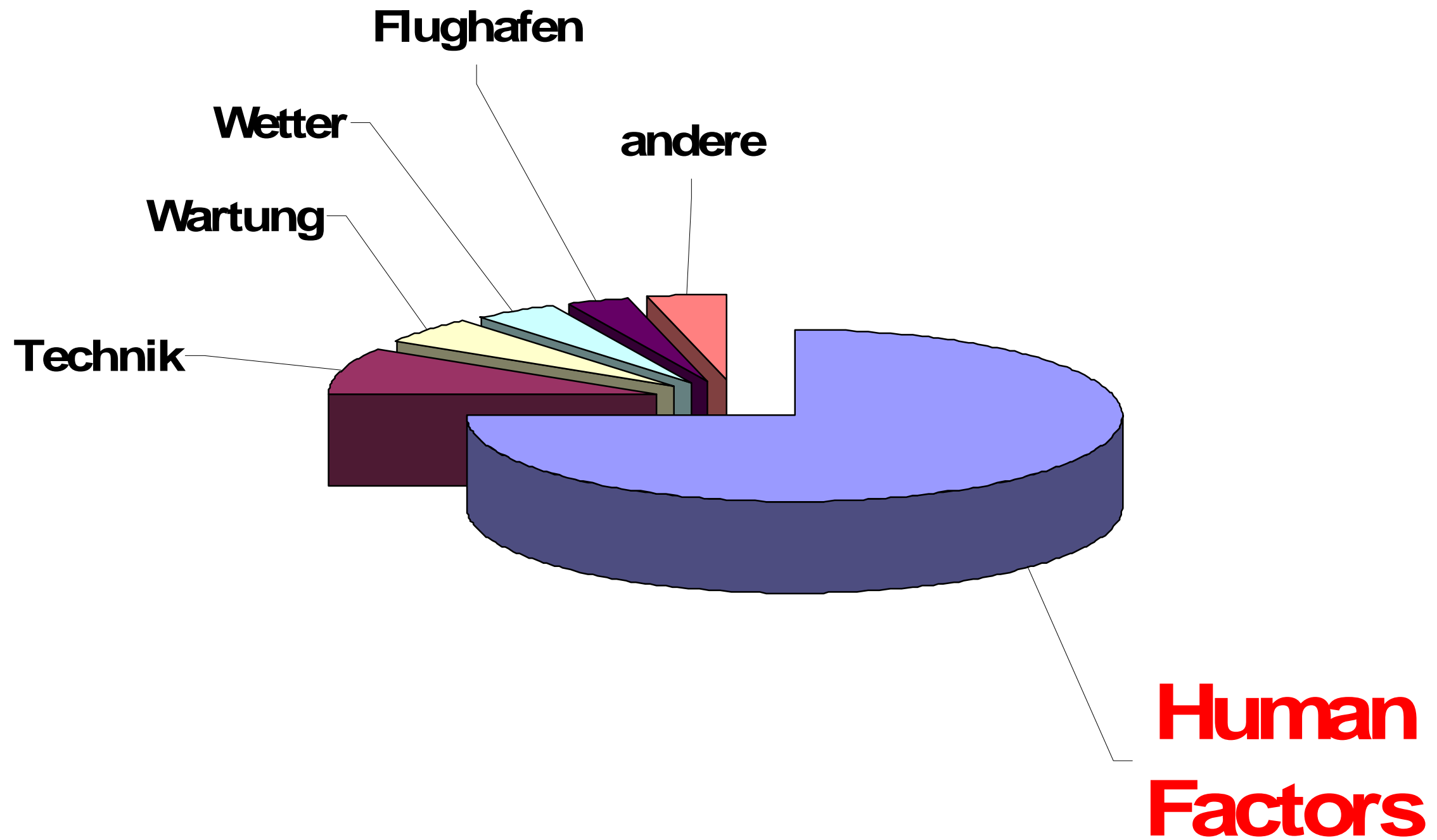
**WHEN?**

➤ But not always discloses:

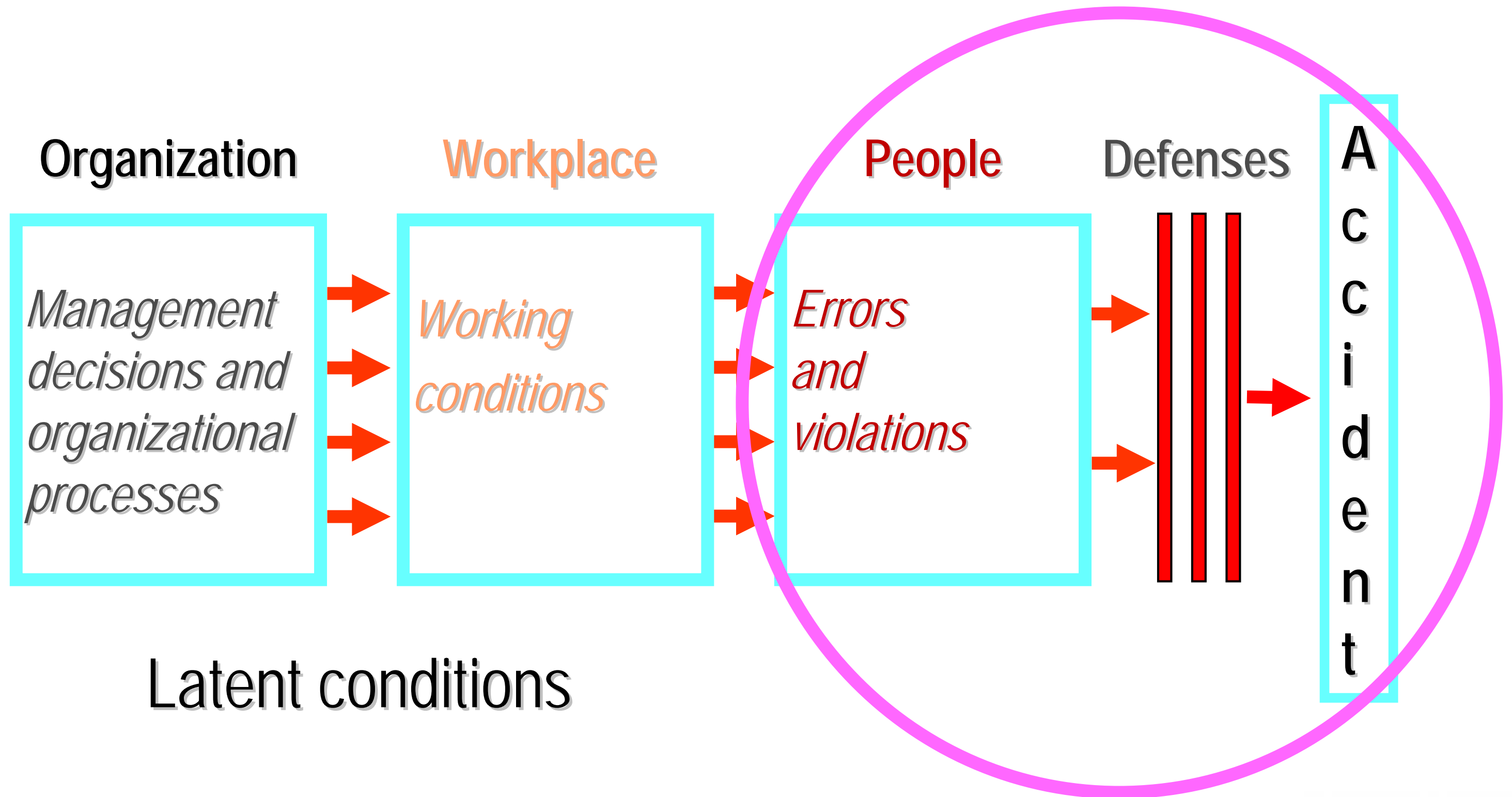
**WHY?**

**HOW?**

# Accident causes



# A concept of accident causation



# Fairchild AFB/USA 1994: Fatal Accident B-52H



## CREW „Czar 52“ Training for Airshow:

**PIC:** Lt Col „Bud“ Holland      **Navigator:** Lt Col Ken Huston  
**Copilot:** Lt Col Mark McGeehan      **Observer:** Colonel Robert Wolff



## „case study of failed leadership“

„...numerous and  
flagrant violations of air  
discipline“

„...incredibly poor  
airmanship“

„...lack of integrity,  
fairness, discipline and  
teamwork“

„...errors of  
leadership“



„I’m going to fly the airshow and yeah, I may have  
someone senior in rank flying with me,... he may be the  
boss on the ground, but I’m the boss in the air and I’ll do  
what I want to do.“

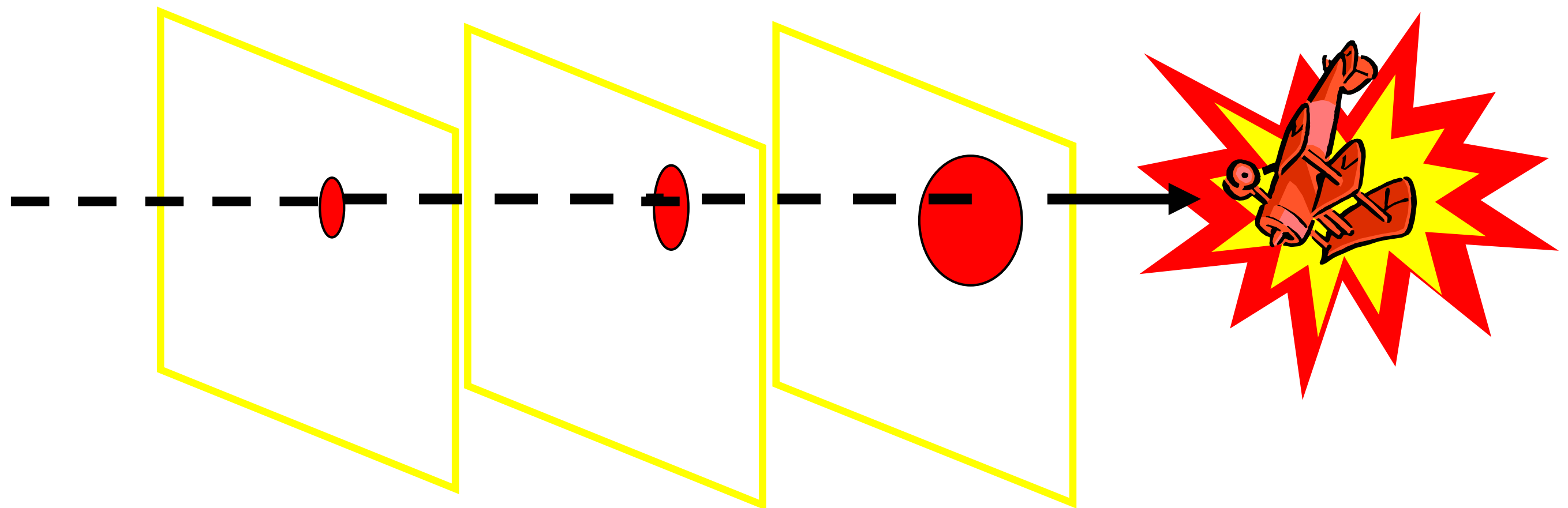
**(Lt Col „Bud“ Holland)**

# Accident prevention – once in a million flights

Flaps  
omitted

Checklist  
failure

Unheeded  
warning



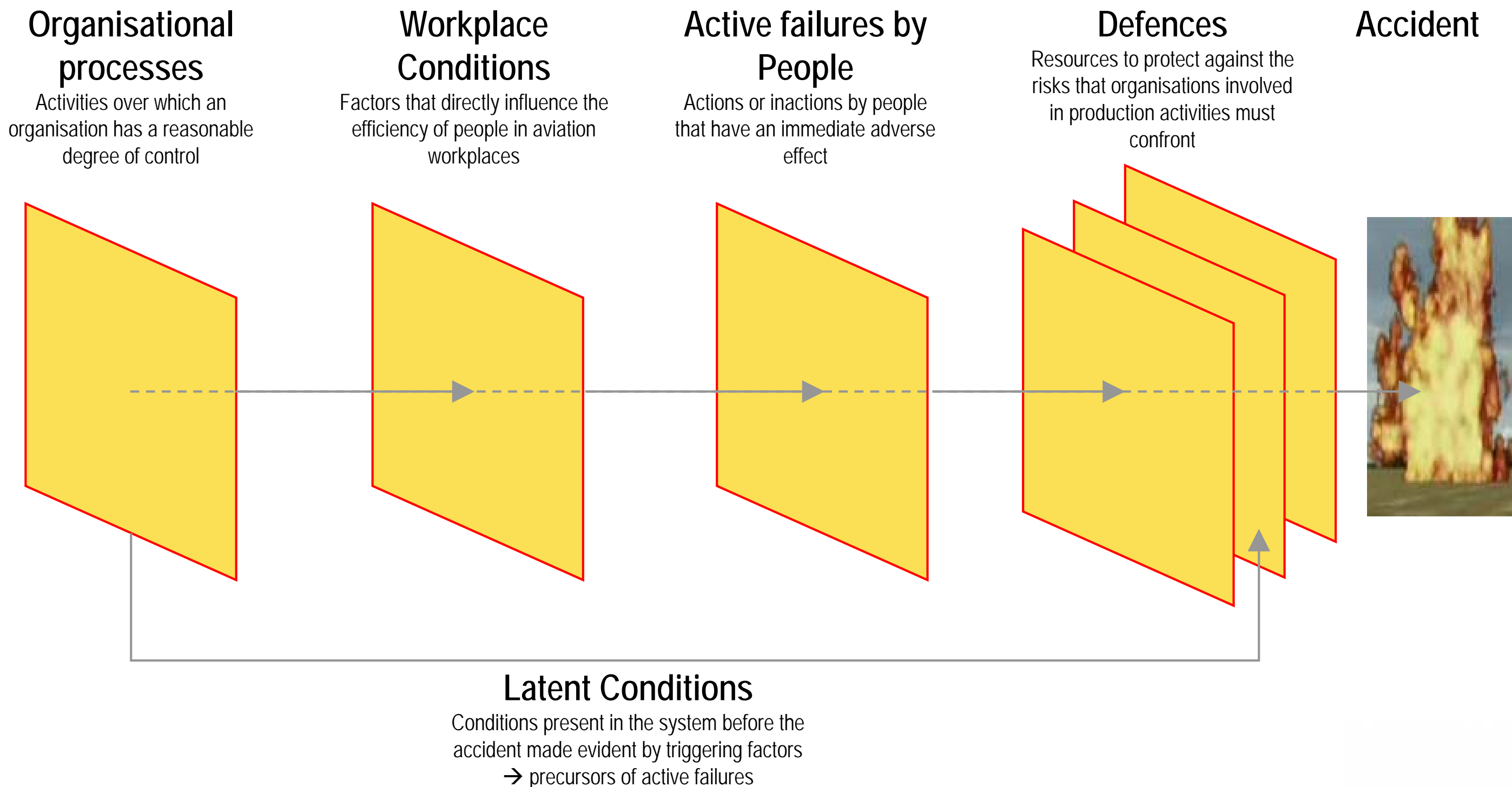
Error

Deviation

Amplification

Degradation/  
breakdown

## Concept of accident causation:



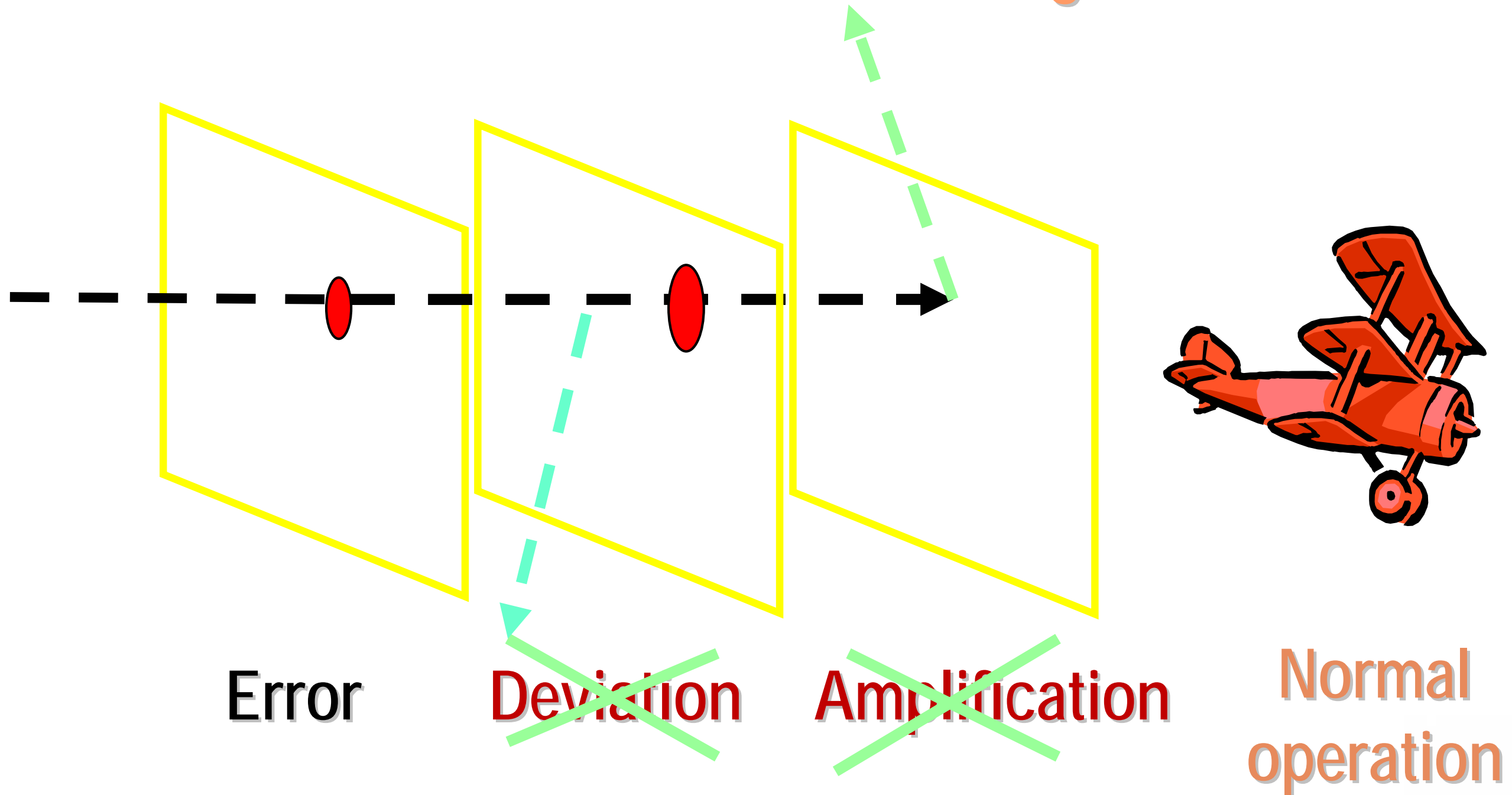
based on: Jim Reason

# On almost every flight

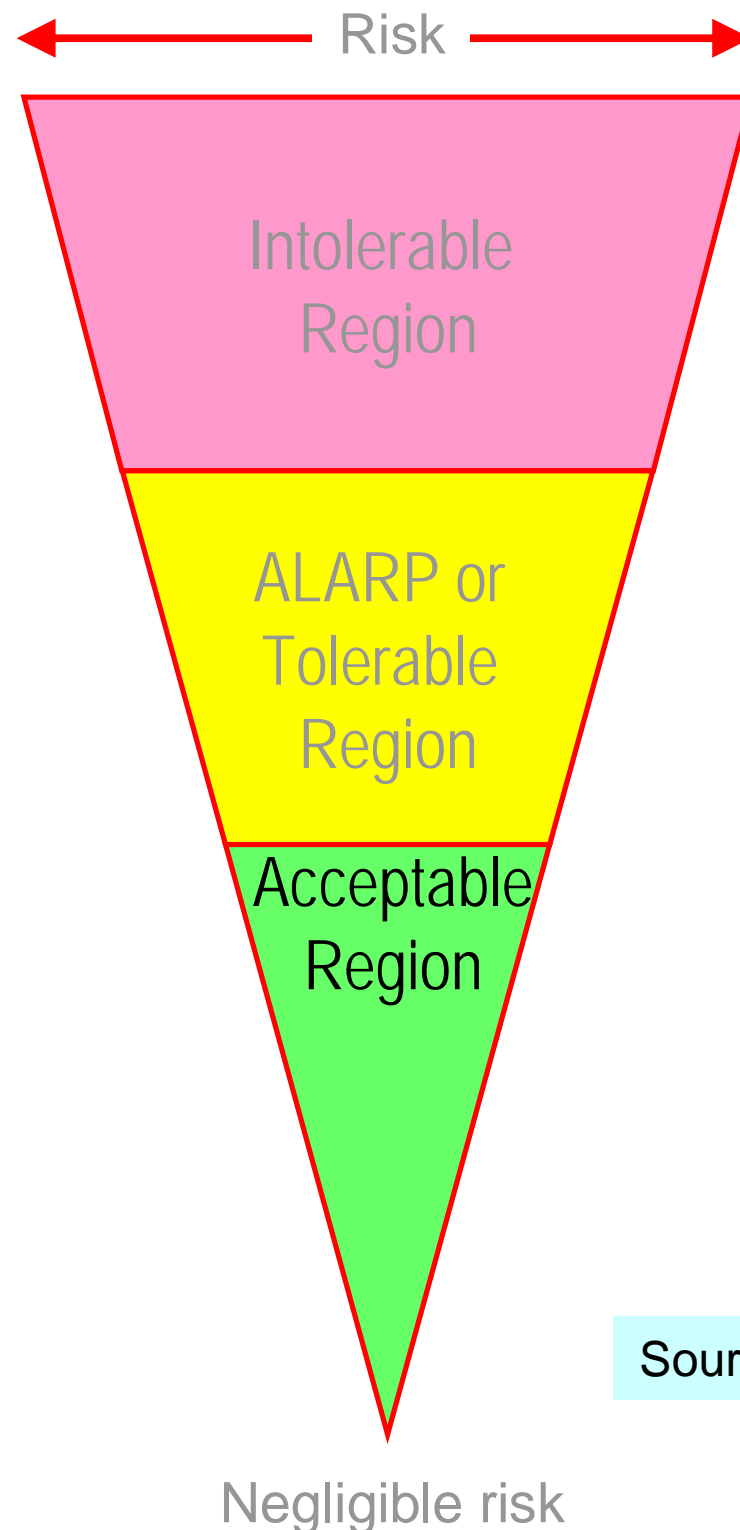
Flaps  
omitted

Checklist  
works

Effective  
warning



## The ALARP Principle



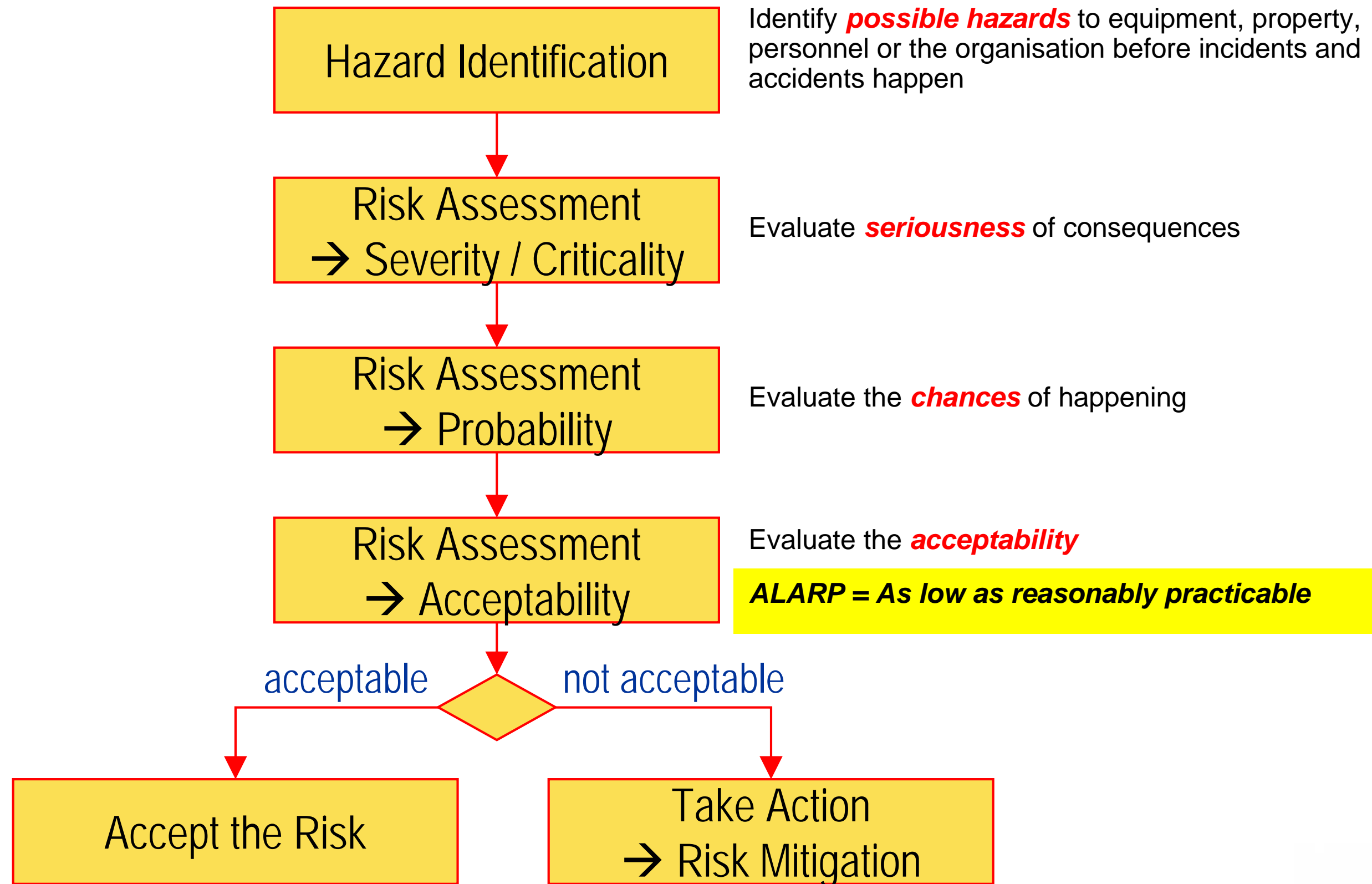
- Risk is unacceptable at this level
- Risk cannot be justified

**ALARP = As low as reasonably practicable**

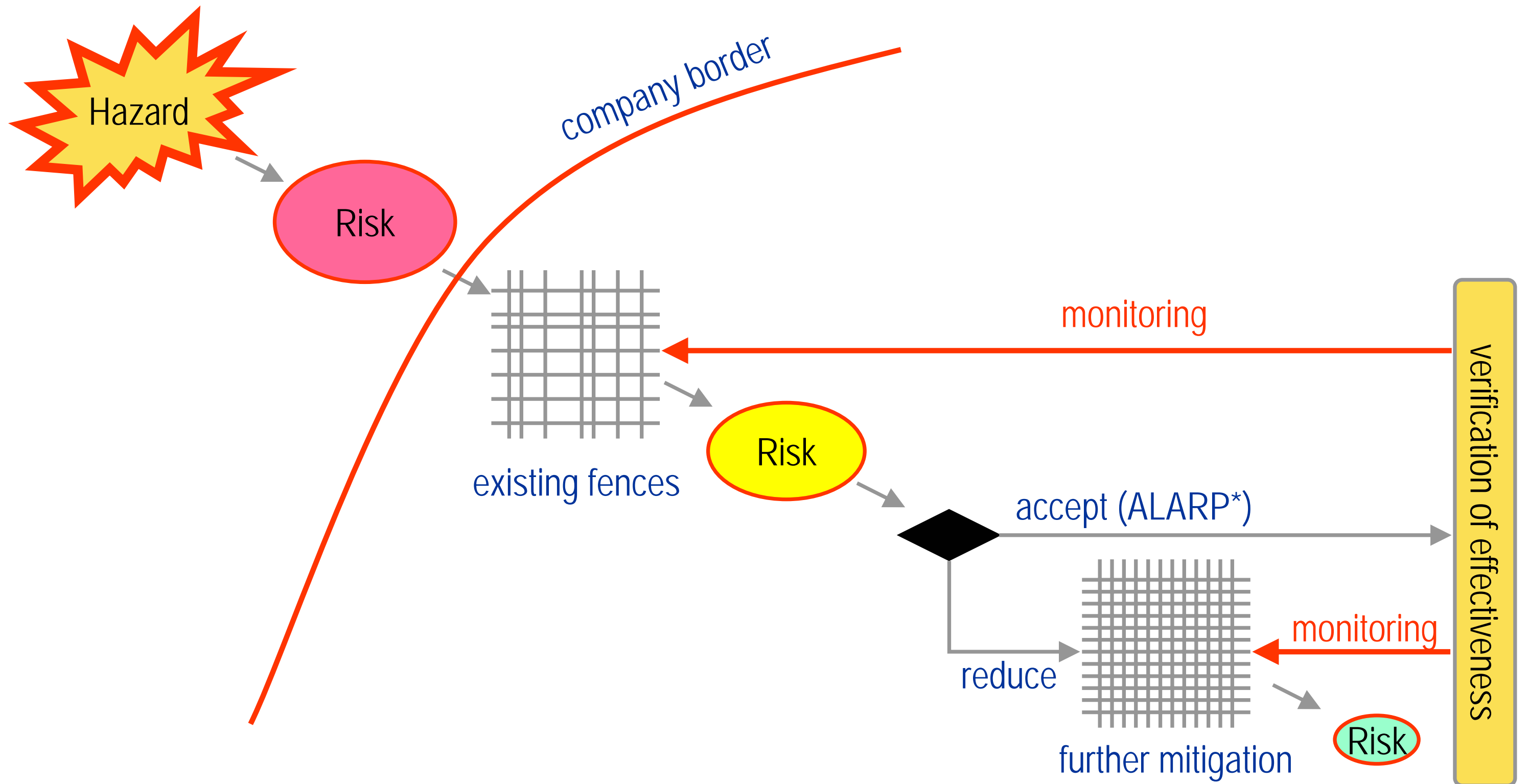
- Risk is undertaken only if a benefit is desired
- Tolerable only if further risk reduction is impracticable or if its cost is grossly disproportionate to the improvement gained → cost / benefit analysis
- Maintain safety assurance that risk remains at this level

Source: ICAO Safety Management Manual / Doc 9859 / § 4.2

# Process of Risk Management



# Principle of Risk Management



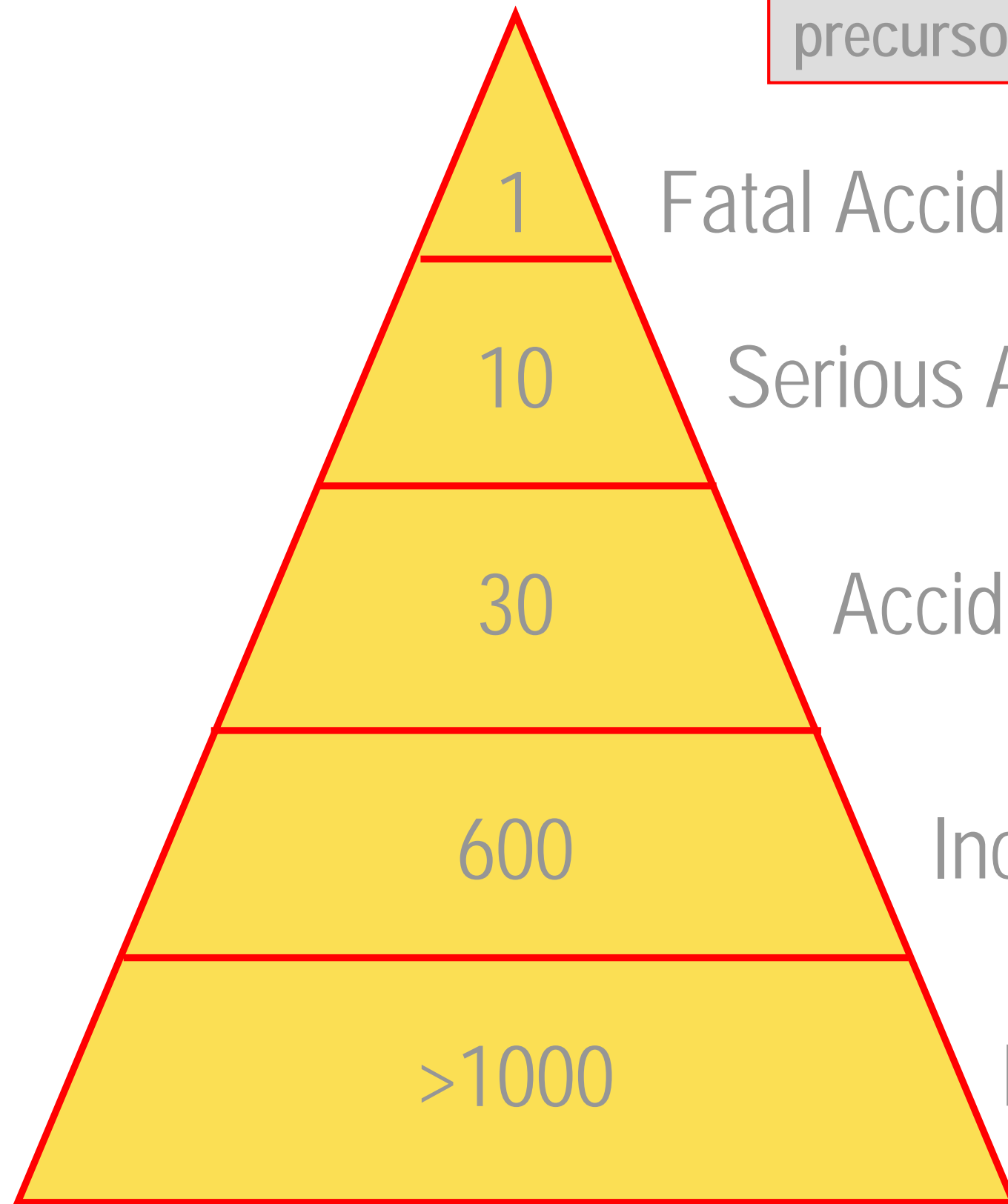
ALARP = as low as reasonably practicable

# Importance of Reporting

## 1 : 600 Rule

Incidents are  
precursors of accidents

Frequency



1 Fatal Accident

10

Serious Accidents

30

Accidents

600

Incidents

>1000

Latent Conditions

Severity

# INCIDENT REPORT

## Characteristics

...an incident report is a usually confidential form that is filled out in order to record details of an unusual event that happens during an operation, or is describing any deviation from company policies.....

## Related to

- ▶ Observed Hazards
- ▶ Observed Risks
- ▶ Flight Safety Aspects



# OCCURRENCE REPORT

## Characteristics

- ▶ ICAO Annex 13

An official form that has to be filled out in order to record specific details of an event associated with the operation of an aircraft in means of

- ▶ Flight Operation
- ▶ Aircraft maintenance and
- ▶ Aircraft operator responsibilities



austro  
CONTROL

## Related to

- ▶ Legal Requirements
- ▶ Flight Safety Aspects

Such as

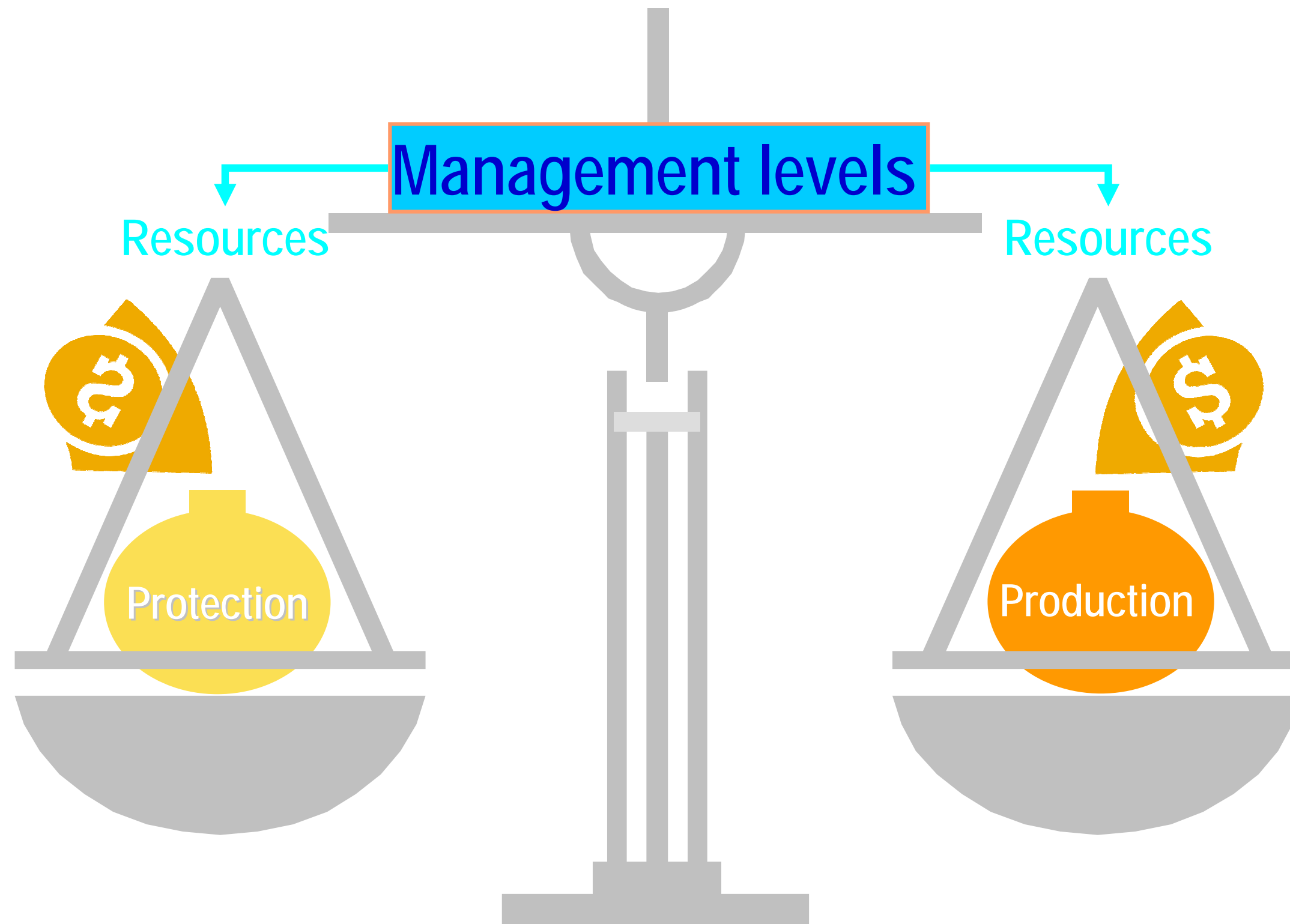
- **Violations**
- Technical Problems
- Birdstrike
- Accidents...et

According to **ICAO Doc 9859 - Safety Management Manual** the following key principles are to be considered when establishing a voluntary reporting system within the generic framework of an organisation's safety management system (SMS):

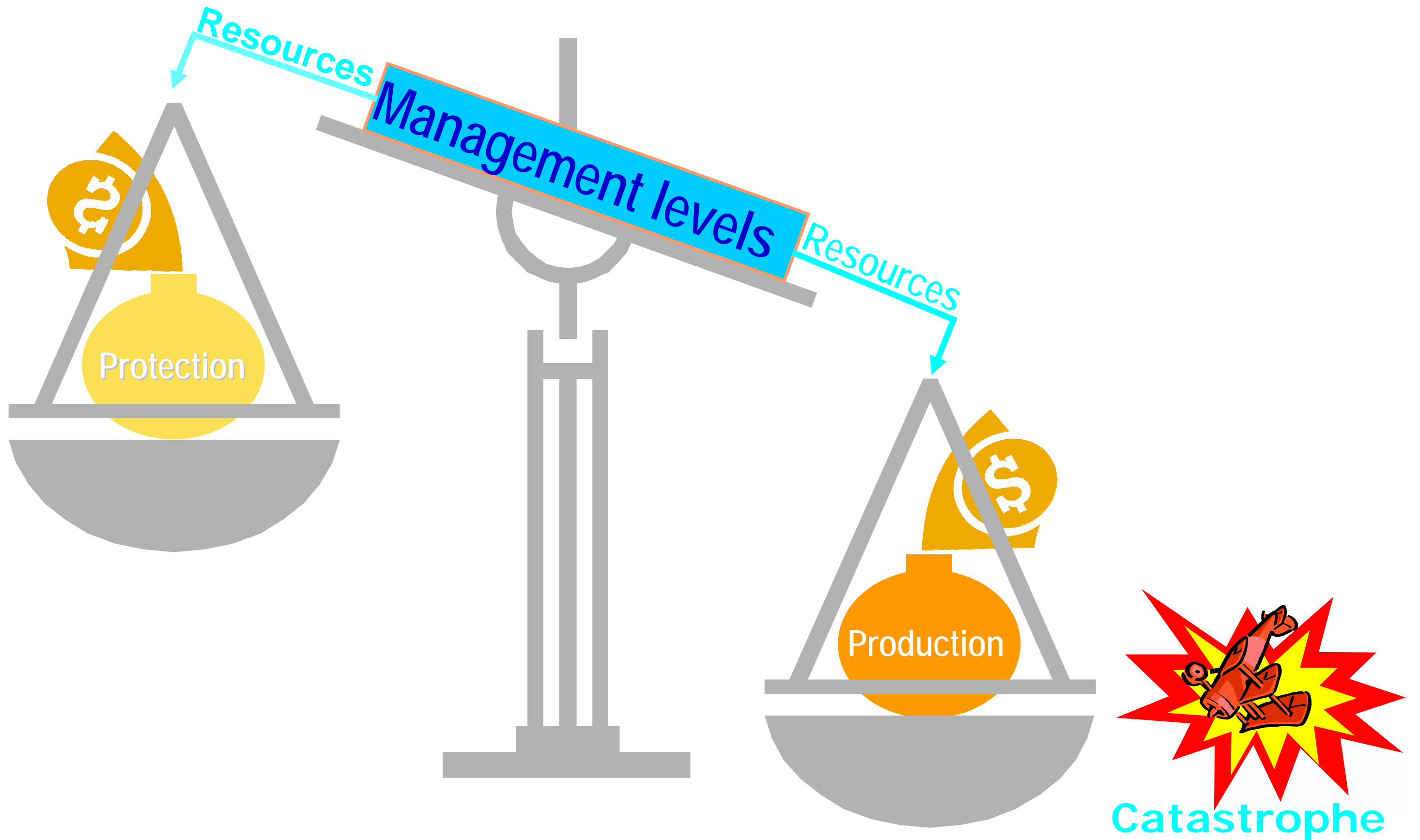
- ▶ **Trust** – The reporters must be certain that the information will not be used against them; otherwise they will be reluctant to report their mistakes. A positive **Safety Culture** in the organisation provides the foundations of a successful occurrence reporting system.
- ▶ **Non-punitive** – The reporting person must be protected against legal, administrative or disciplinary sanctions, except in case of gross negligence, criminal activity or intent.
- ▶ **Inclusive Reporting Base** – The systematic approach to **safety management required that voluntary reporting be targeted at all aspects of aircraft operation, such as flight operation, cabin safety, aircraft maintenance, air navigation services, aerodrome operation**, etc. Also, collecting information on the same occurrence from different perspectives provides for a complete analysis and understanding of events, and consequently of the hazards and their effects.
- ▶ **Confidentiality** - Non-punitive systems are based on confidential reporting. The person reporting an incident must be sure that his identity and other information that may be used to identify involved other physical or legal personalities will not be disclosed. In some States legislation on access to information makes it increasingly difficult to guarantee confidentiality. This could limit the safety occurrence reporting to the minimum required for mandatory reporting.

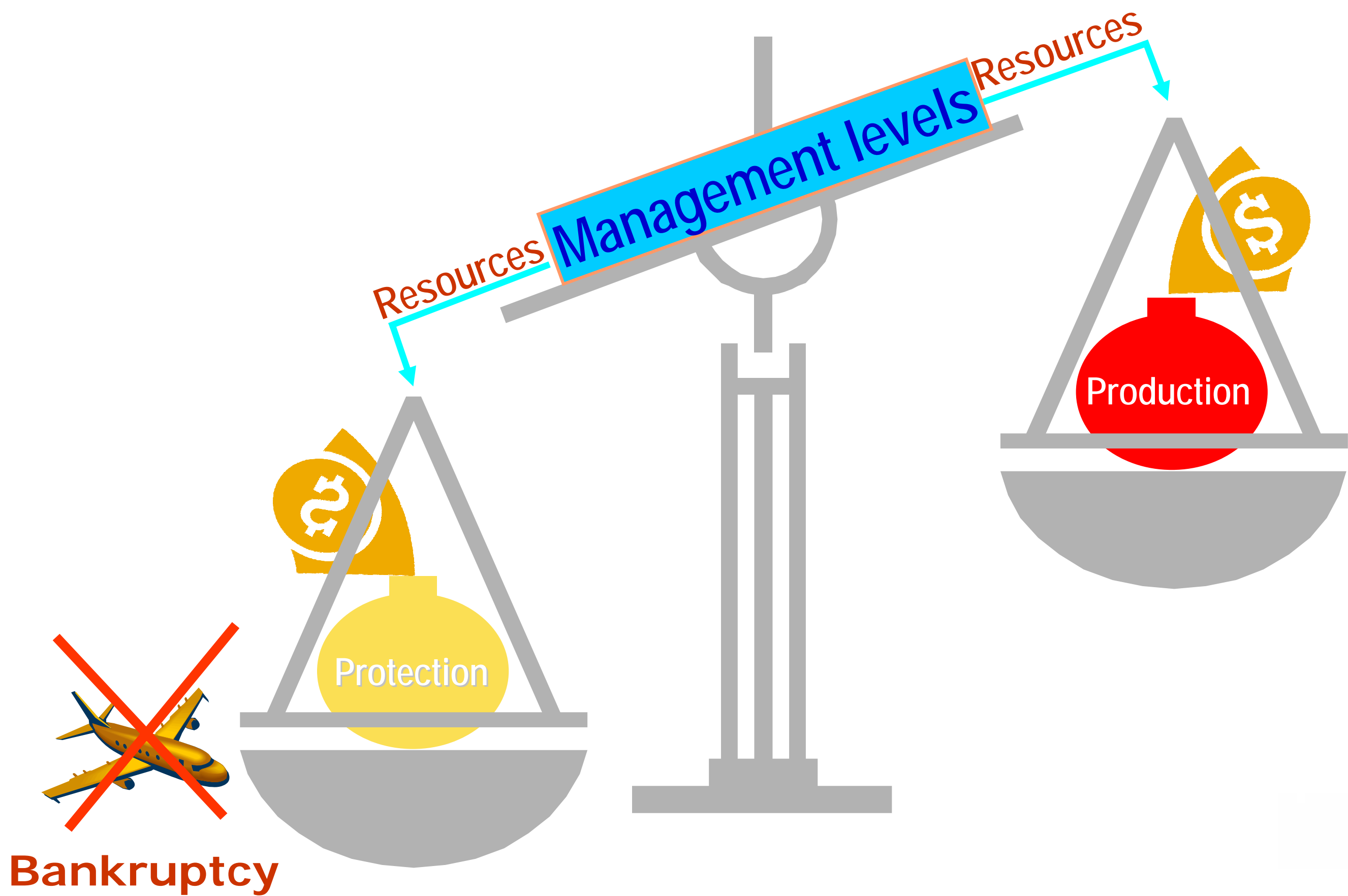
- ▶ **Independence** – Ideally, the voluntary reporting system will be operated by an organisation that is separated from the State regulatory authorities. This organisation will collect and analyse safety reports and feed the results back to the regulatory authorities and the aviation community.
- ▶ **Ease of reporting** – Submitting a report should be as easy as possible for the reporter. The reporting forms should be readily available to anyone wishing to file a report. They should be easy to compile, provide adequate space for narrative and make maximum use of the “tick off” format. The forms should encourage safety improvement suggestions, such as how to prevent reoccurrence of a hazard or deal with it.
- ▶ **Acknowledgment** – To encourage further submission of reports the organisation should clearly communicate to its personnel that the voluntary reports are a valuable safety asset and acknowledge the efforts made by reporting persons. Whenever possible, feedback on the actions taken in response to a report shall be provided to the reporting person.
- ▶ **Promotion** – The de-identified information received from the voluntary reporting system should be made available to the aviation community in a timely manner. A variety of information dissemination methods should be used to achieve maximum exposure, for example monthly newsletters, periodic summaries, safety bulletins published on internet etc. Such promotional activity may help motivate people to improve further the reporting of safety occurrences.

# The management dilemma

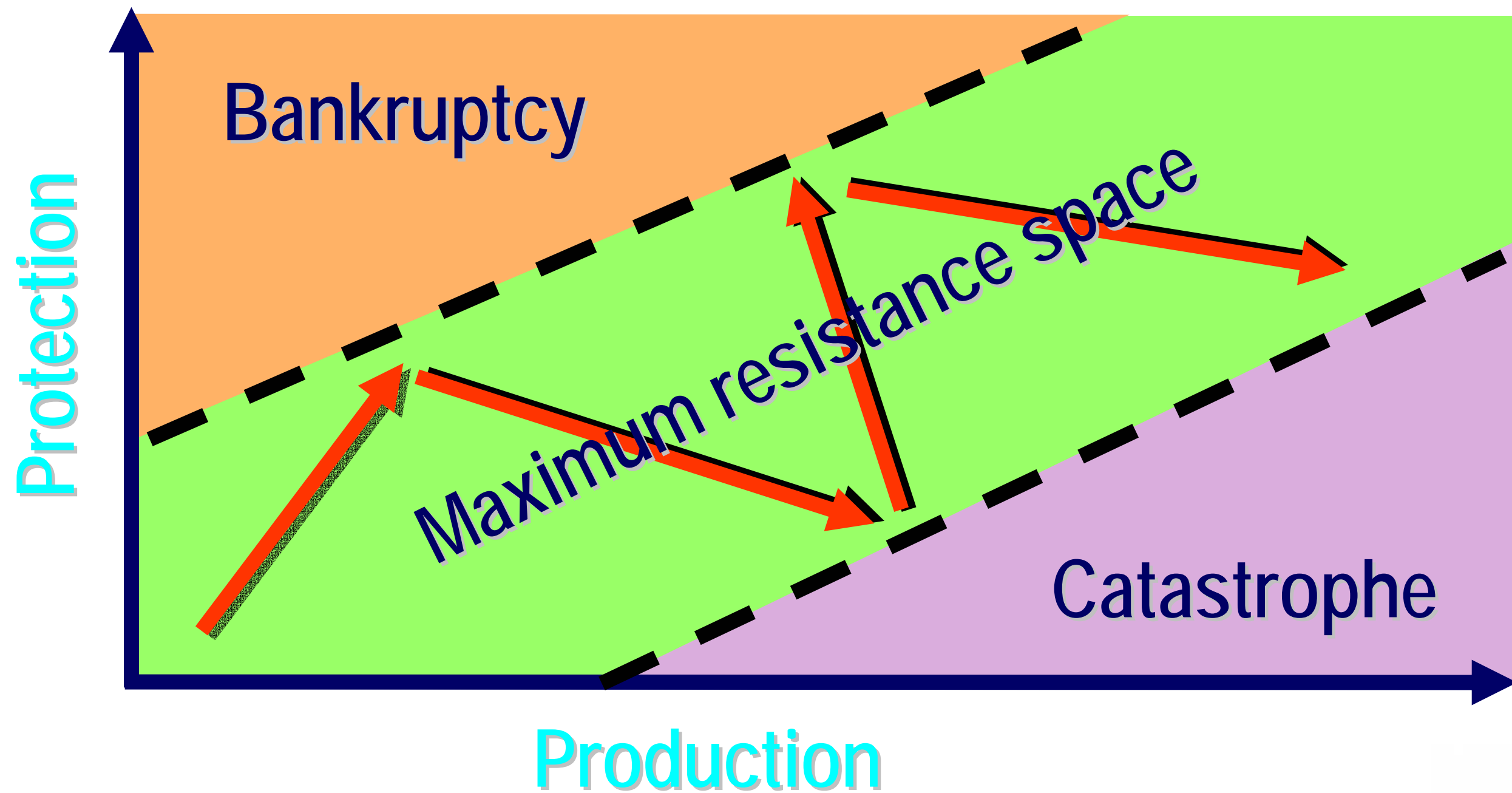


# The management dilemma



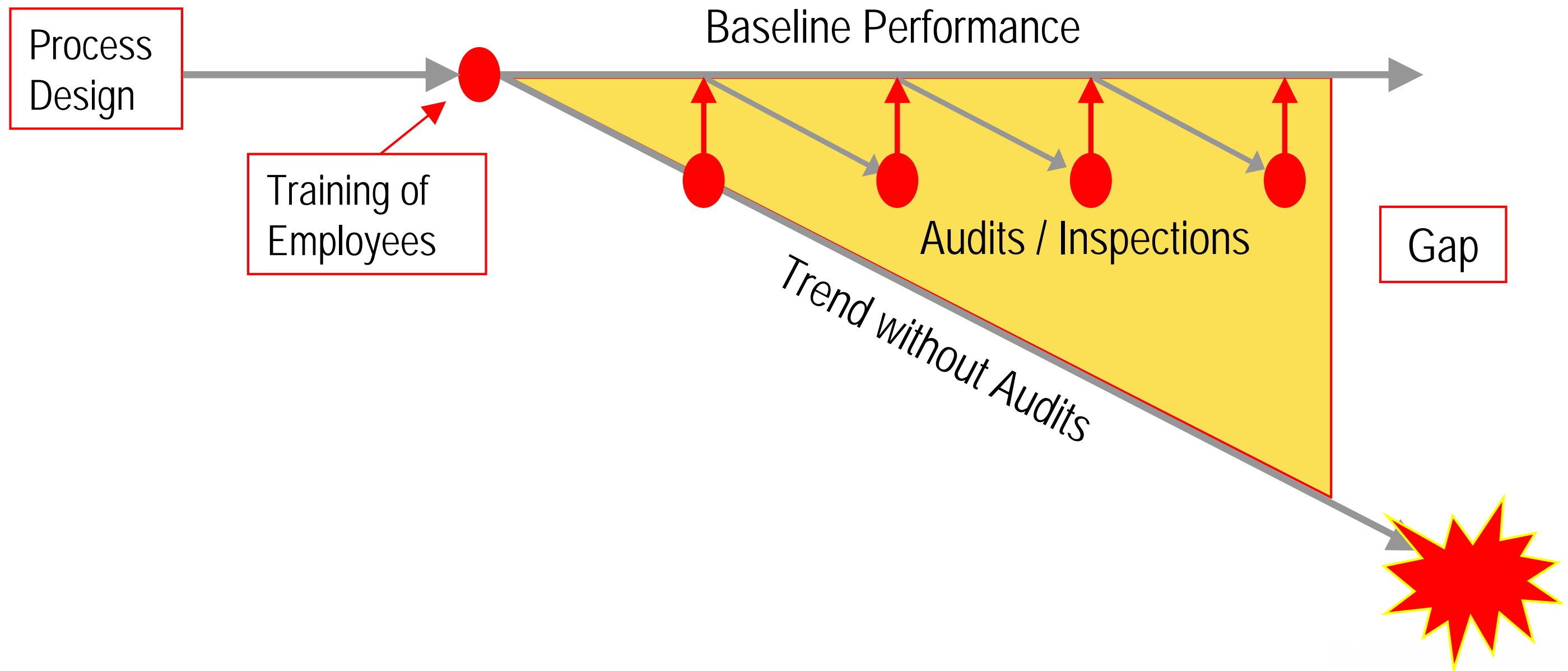


# Safety space





## Today's approach: Focus on compliance



# Reactive method

*The reactive method responds to the events that already happened, such as incidents and accidents.....*



## Reactive Safety Strategy:

- Investigate accidents and reportable incidents
- focus on compliance with **minimum** requirements
- safety measurement is based on **reportable** occurrences
- waiting until something breaks to fix it

# Reactive Safety Management



- ▶ Based on Investigation of accidents and serious incidents
- ▶ Based upon the notion of waiting until something breaks
- ▶ Important is that also triggering causes and contributory factors to risks are identified
- ▶ → *Analysis of "what happened and why?"*

## Proactive method

*The proactive method looks actively for the identification of safety risks through the analysis of the organization's activities.....*

### Proactive Safety Strategy:

- Identify safety risks within the existing system before it fails
- Take necessary actions to reduce such safety risks
- Safety measurement is based on monitoring existing system



# Pro-active Safety Management



- ▶ Based on **mandatory and voluntary reporting systems, safety audits and surveys**
- ▶ Based upon the notion that failures can be minimised by **identifying safety risk** within a
- ▶ System **before it fails** and that necessary **actions can be taken to reduce such risks**
- ▶ → *Analysis of "what could happen if ....."*

## Strategies

# Predictive method

*The predictive method captures system performance as it happens in real-time normal operations.....*

### Predictive Safety Strategy:

- Looking for trouble not waiting for it
- Aggressively seeking information from a variety of sources which may be indicative of emerging safety problems



# Predictive Safety Management



- ▶ Aggressively seeking information from variety of sources which may be indicative of emerging safety risks
- ▶ Based upon the notion that we have to look for trouble and not to wait for it.
- ▶ → *Analysis of this ( ) and that ( ) happens surly, if we not....."*

# Safety Culture indicators - check your own status!

**PREDICTIVE**

Yes, we can!  
safety seen as a profit centre  
new ideas are welcomed

**PROACTIVE**

resources are available to fix things before an accident  
management is open but still obsessed with statistics  
procedures are "owned" by the workforce

**CALCULATIVE**

We cracked it!  
lots and lots of audits  
advisers chasing statistics

**REACTIVE**

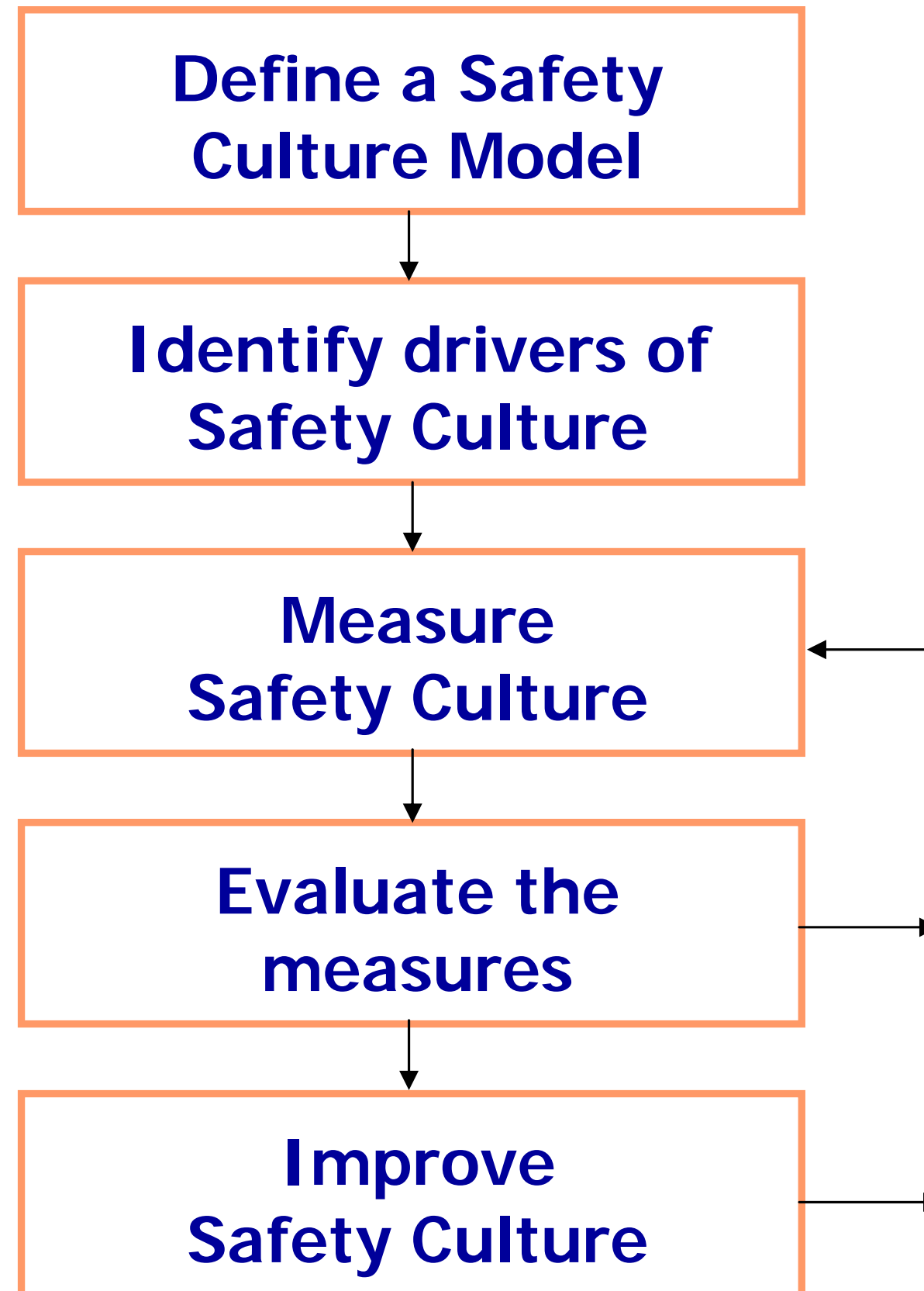
We are serious, but why don't they do what they're told? = endless discussions to re-classify accidents  
Safety is high on the agenda after an accident

**PATHOLOGICAL**

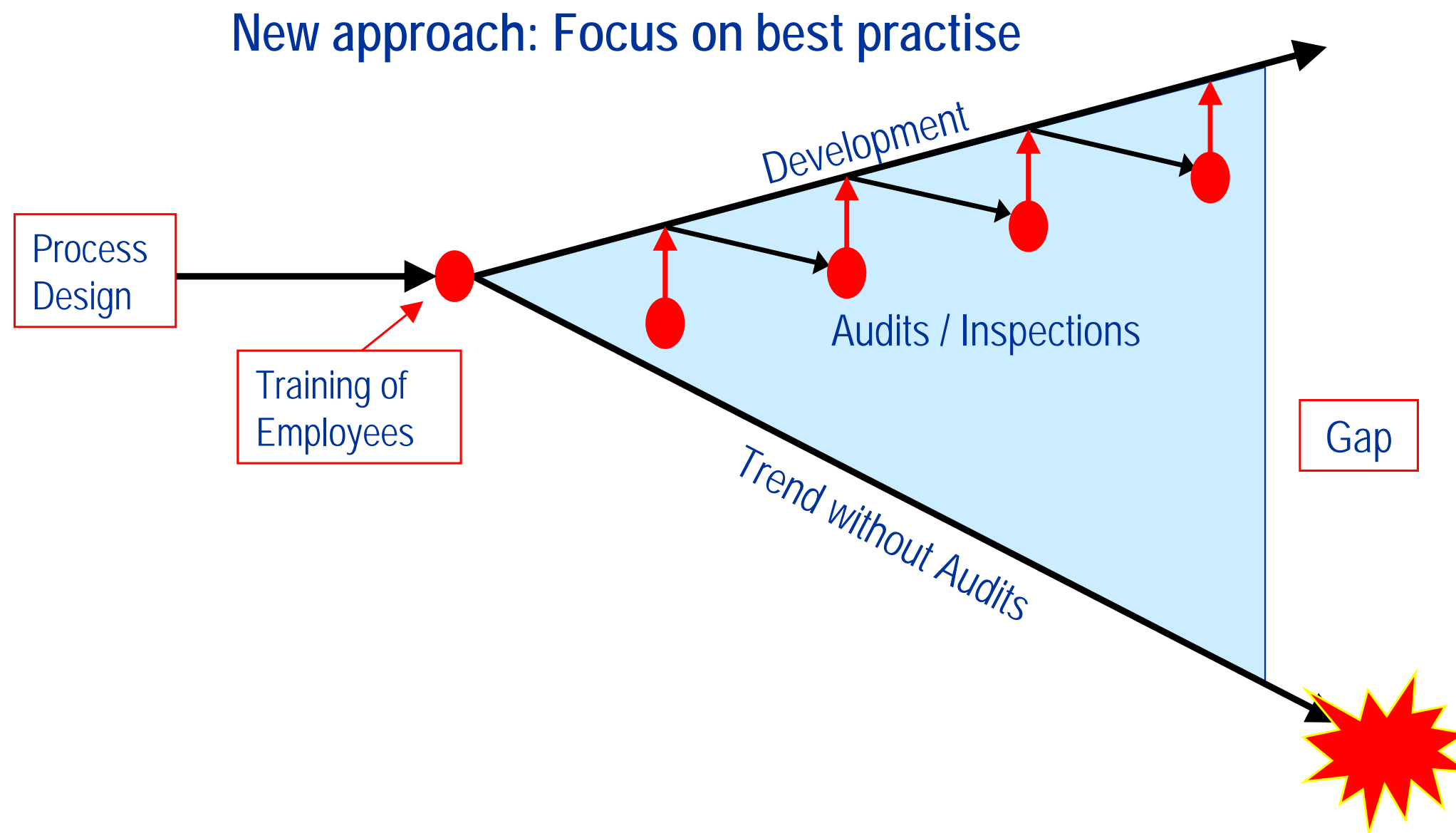
The lawyers said it was OK!  
of course we have accidents, it's a dangerous business  
sack the idiot who had the accident



# Safety Culture Process Model



# The development process is a benefit for the company.....!

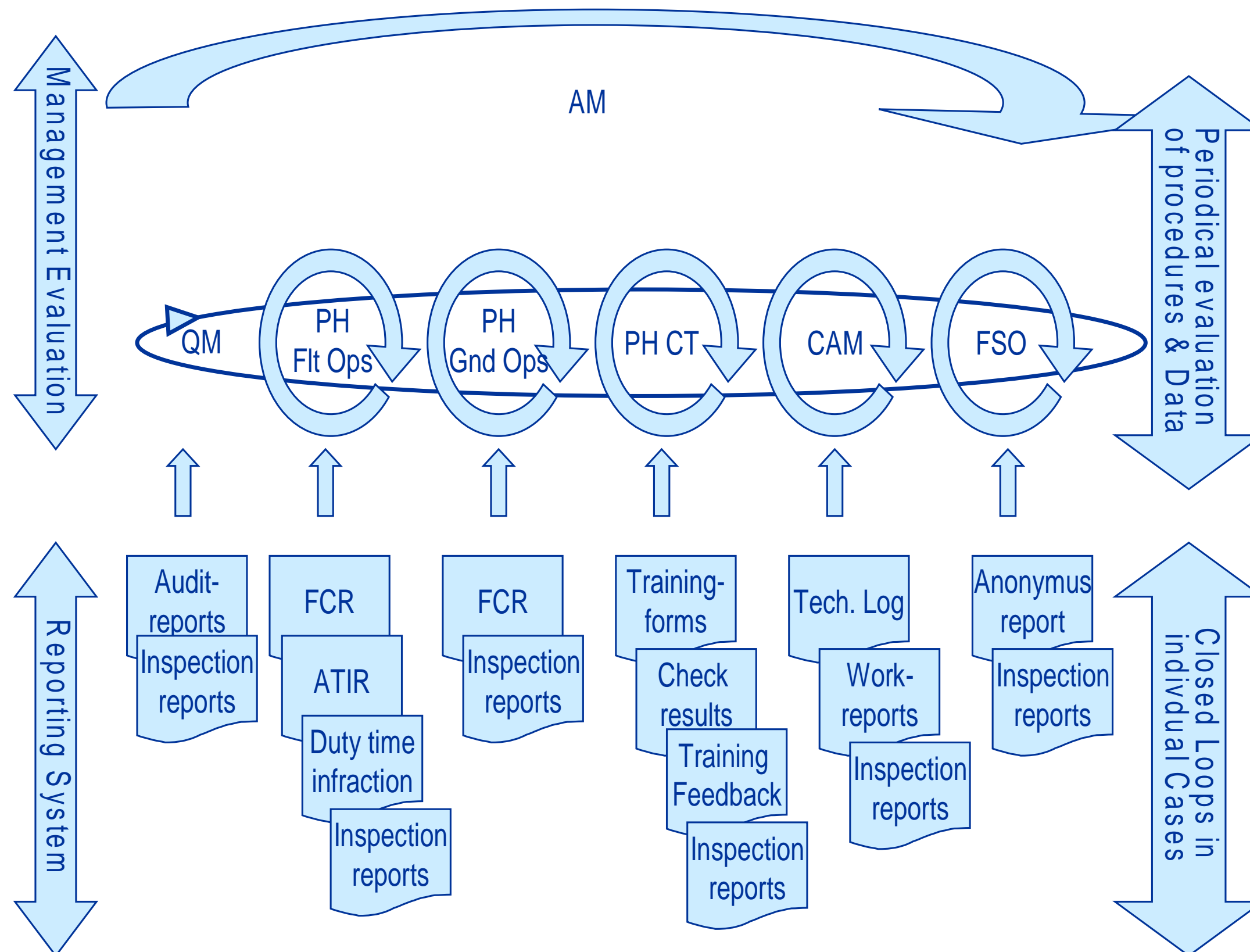


# (ex) FURTHER BENEFIT`s



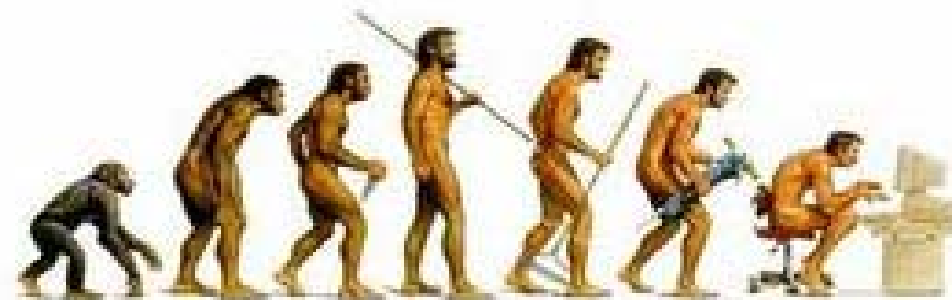
- ▶ **FINANCIAL**      could be insurance price reduction  
safe operation / less maintenance ...  
happy people in the company / less  
changes....+ +
- ▶ **REPUTATION**   Customer selects safe company
- ▶ **CAA**              Trust / good relationship

# A good Management Evaluation Approach...



# SMS – A tool box

- ▶ The scope of SMS encompasses most of the activities of the organization.
- ▶ SMS must start from senior management, and safety must be considered at all levels of the organization.
- ▶ SMS aims to make continuous improvement to the overall level of safety.



- ▶ **All** aviation stakeholders have a role to play in SMS!

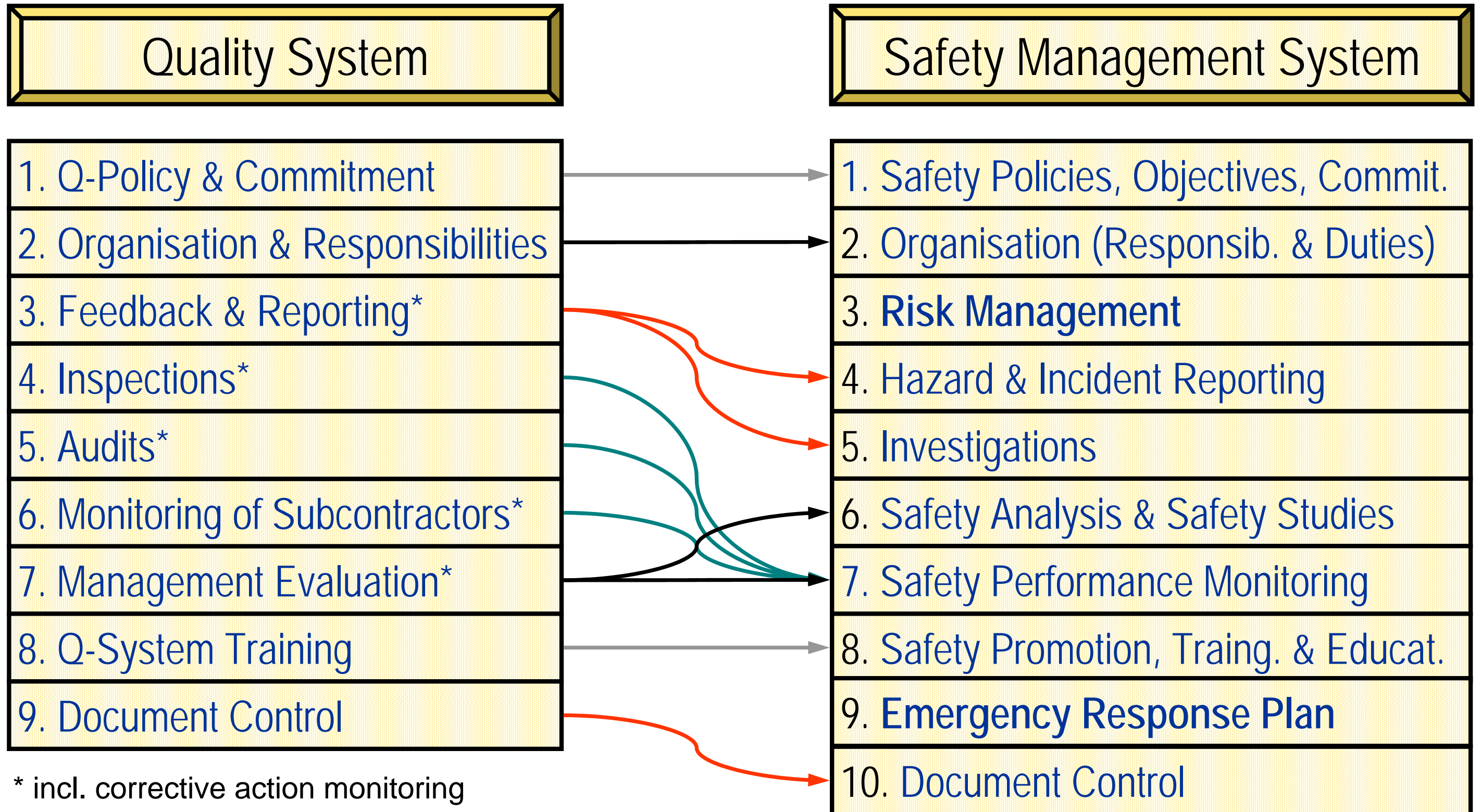
# SMS and QMS – Striking a balance

- ▶ SMS builds partly upon QMS principles.
- ▶ **SMS should include both safety and quality policies. = SQMS**
- ▶ The coverage of quality policies should be limited to quality in support of safety.
- ▶ Safety objectives should receive primacy where conflicts are identified.



"I propose that we change our motto from 'Put Your Best Foot Forward' to 'Safety First.'"

# Synergies QS ↔ SMS



# Core Elements of an integrated SQMS (I) ICAO Doc 9856

## 1. Safety & Quality Policy

- incl. commitment and procedure for deployment

## 2. Organisation & Responsibilities

- considering existing definitions in OM , CAME, etc

## 3. Risk Management

- hazard identification
- risk assessment
- mitigation of risks
- corrective / preventive action implementation and monitoring

## 4. Feedback & Reporting

- treatment of reports considering concurrencies, (potential) hazards
- risk assessment
- corrective action implementation and monitoring
- open culture, non punitive reporting

## 5. Investigations

- including corrective action implementation and monitoring

## 6. Inspections

- ensuring control and supervision by superiors
- including corrective action implementation and monitoring



# Core Elements of an integrated SQMS (II)

## 7. Audits

- covering safety relevant operational processes and SMS itself
- including corrective action implementation and monitoring

## 8. Monitoring of Subcontractors

- concept of risk management based monitoring activities
- including corrective action implementation and monitoring

## 9. Management Evaluation

- including Surveys
- including Safety Analysis & Safety Studies → data evaluation
- Safety Performance Management → based on specified indicators  
→ evaluation of overall effectiveness of the company
- including corrective action implementation and monitoring

## 10. Safety & Quality Promotion, Training & Education

- initial AND recurrent training on all levels considering safety relevant processes & SMS itself
- promulgation of information & sharing experiences

## 11. Document Control

- storage of SQMS relevant records
- amendment of SQMS relevant documents)



# Summary ACG Approach....

- ▶ Information to companies (August / 2007)
- ▶ PHASED APPROACH starting spring 2009
- ▶ Establishment of SQMS starting summer 2009
  
- Implementation of Safety and Quality Management Systems
- Training of personnel to be fit for duty
- Starting with process and procedures
- Establishment of practicable reporting systems
- Safety and Quality assurance in ONE SQMS System
- Development of the SQMS System **TOGETHER!**
- **Monitoring and increasing of benefits for all** involved parties

# THANK YOU .....

## Questions?

