International Federation of Air Line Pilots' Associations

IFALPA

The Global Voice of Pilots

IFALPA HelCom, a global cooperation

WFP – Safety Workshop

4th- 5th of February, Kathmandu, Nepal


First IFALPA Conference in London, 1948

What is IFALPA?

- Is a non-political, not-for-profit organization:

> The International Federation of Air Line Pilots' Associations (IFALPA) represents over 100,000 pilots in almost 100 countries.
>
> The mission of IFALPA is to be the global voice of professional pilots by providing representation, services and support in order to promote the highest level of aviation safety worldwide.

Mission Statement

- Interact with International Organizations to achieve the highest level of aviation safety:
  - Promoting the highest level of safety worldwide:

WFP
wfp.org
World Food Programme

  - Developing policies and postions.
  - Promoting the adoption of such policies by ICAO, regulatory authorities and States

Mission Statement

- Promote and enhance the role and status of professional pilots:
  - Ensure safety of the aircraft, well-being of passengers and goods entrusted to their care.
  - Promote a viable and expanding air transport industry.
  - Provide training and education for the benefit of professional pilots

Mission Statement

- Providing Memeber Associations with services as needed:
  - Assiting in the organizational development of MA.
  - Supporting MA by providing expertise in areas:
    - Technical.
    - Safety.
    - Regulatory.
    - Industrial issues.
  - Facilitating the exchange of information.
  - Coordination of activities among MA a Pilot Alliances:
    - Conference.
    - Regional Meetings
    - Committes

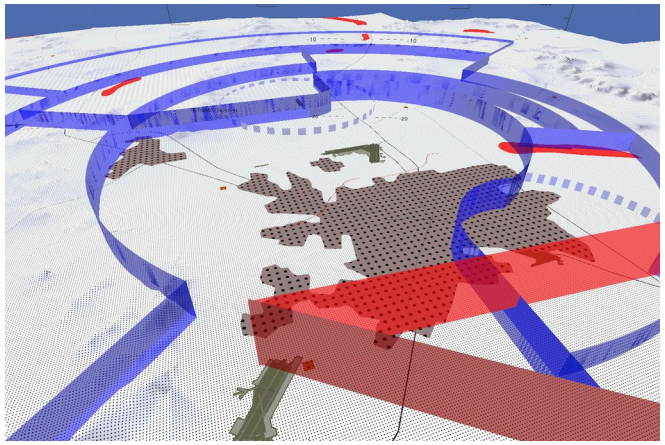
IFALPA MAJOR ACCOMPLISMENTS AND MATERIALS

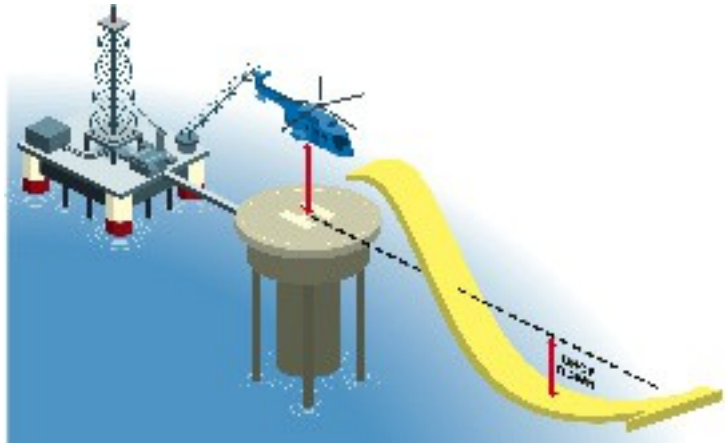

260
40
220 KNOTS
AIRSPEED
60
180
80
160
100
140
120
ALT
CLIMB


6
NM
00
+02
-03
-10

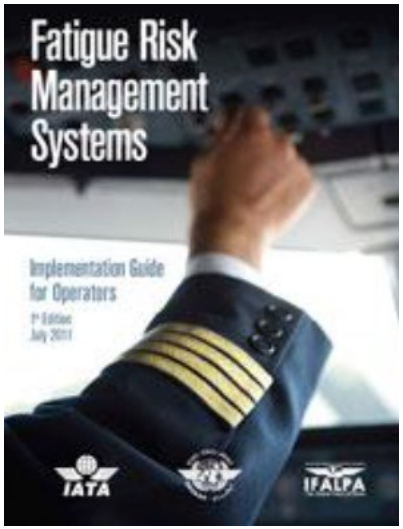

ETOPS
universalweather.com/blog

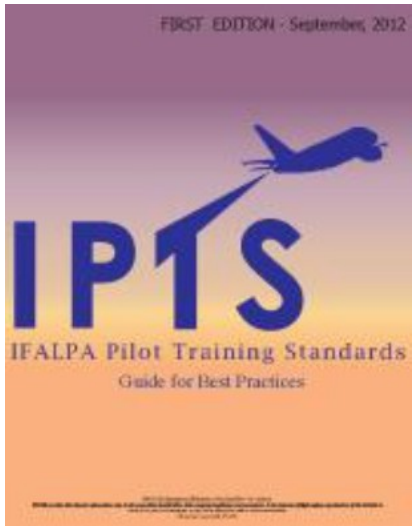

CORROSIVO
8
EXPLOSIVO
1
LÍQUIDO INFLAMÁVEL
3
COMBUSTÃO ESPONTÂNEA
4
PERIGOSO QUANDO MOLHADO
4
OXIDANTE
5
TÓXICO
6
RADIOATIVO
7
SÓLIDO INFLAMÁVEL
4

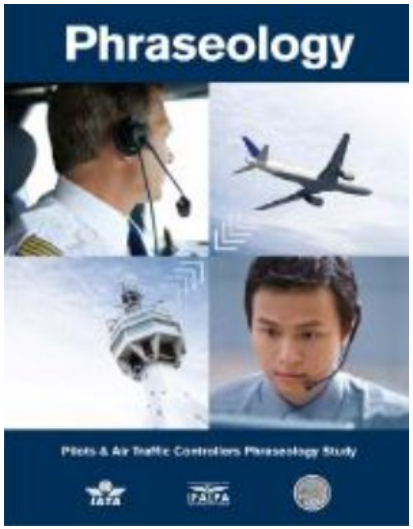


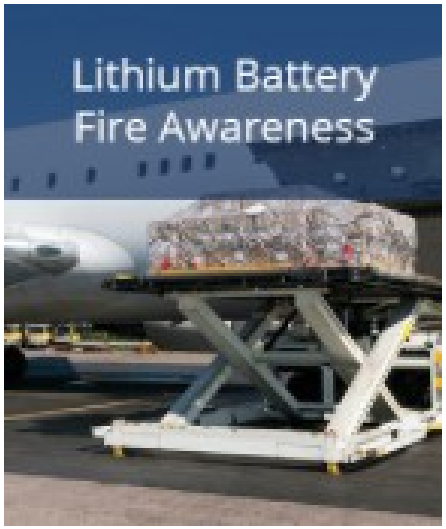


Publications & Manuals









Manuals

Position Papers

Monthly updates

Safety Bulletins

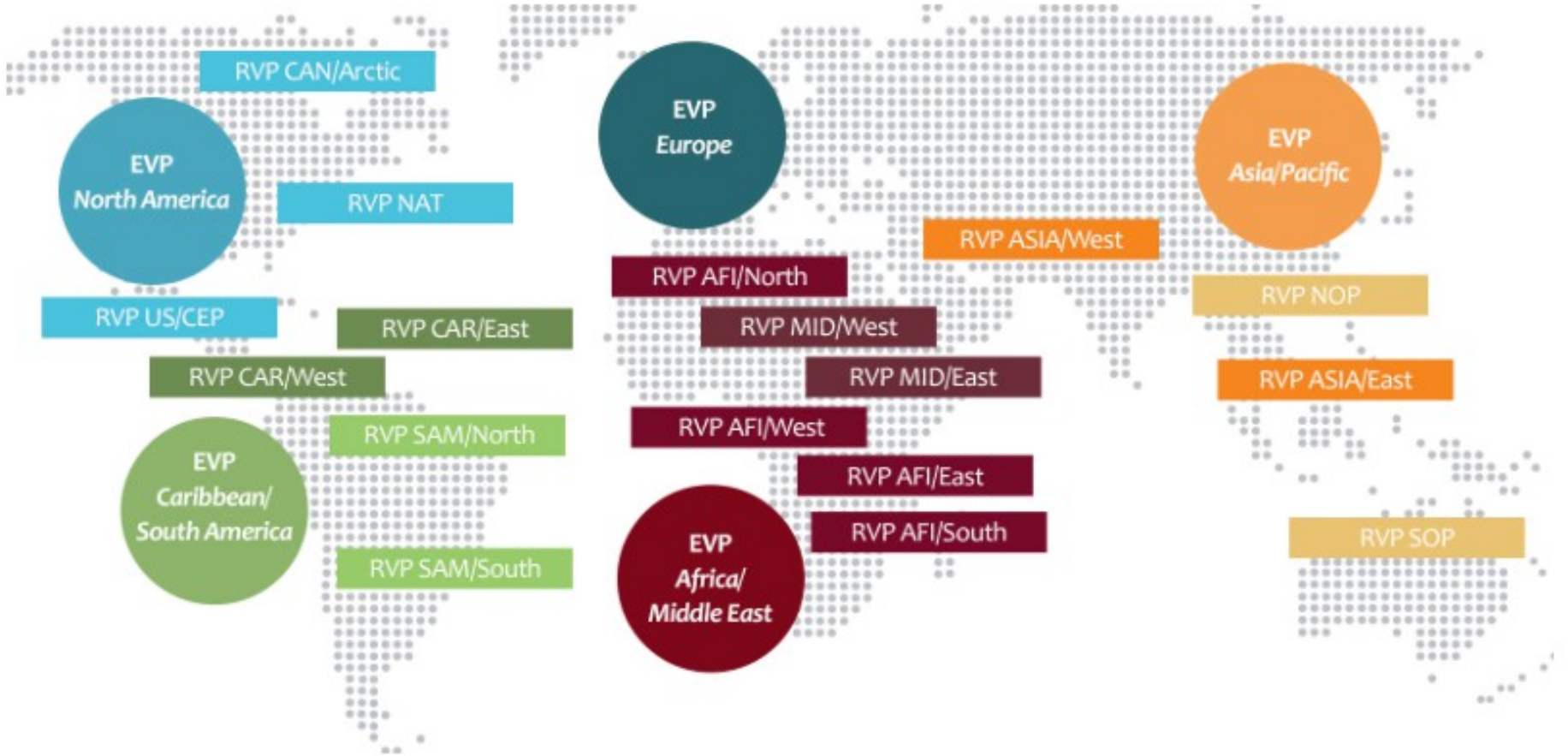
Briefing Leaflets

FRM

IFALPA STRUCTURE

Regions

- Work divided in 5 regions, each with 1 EVP:



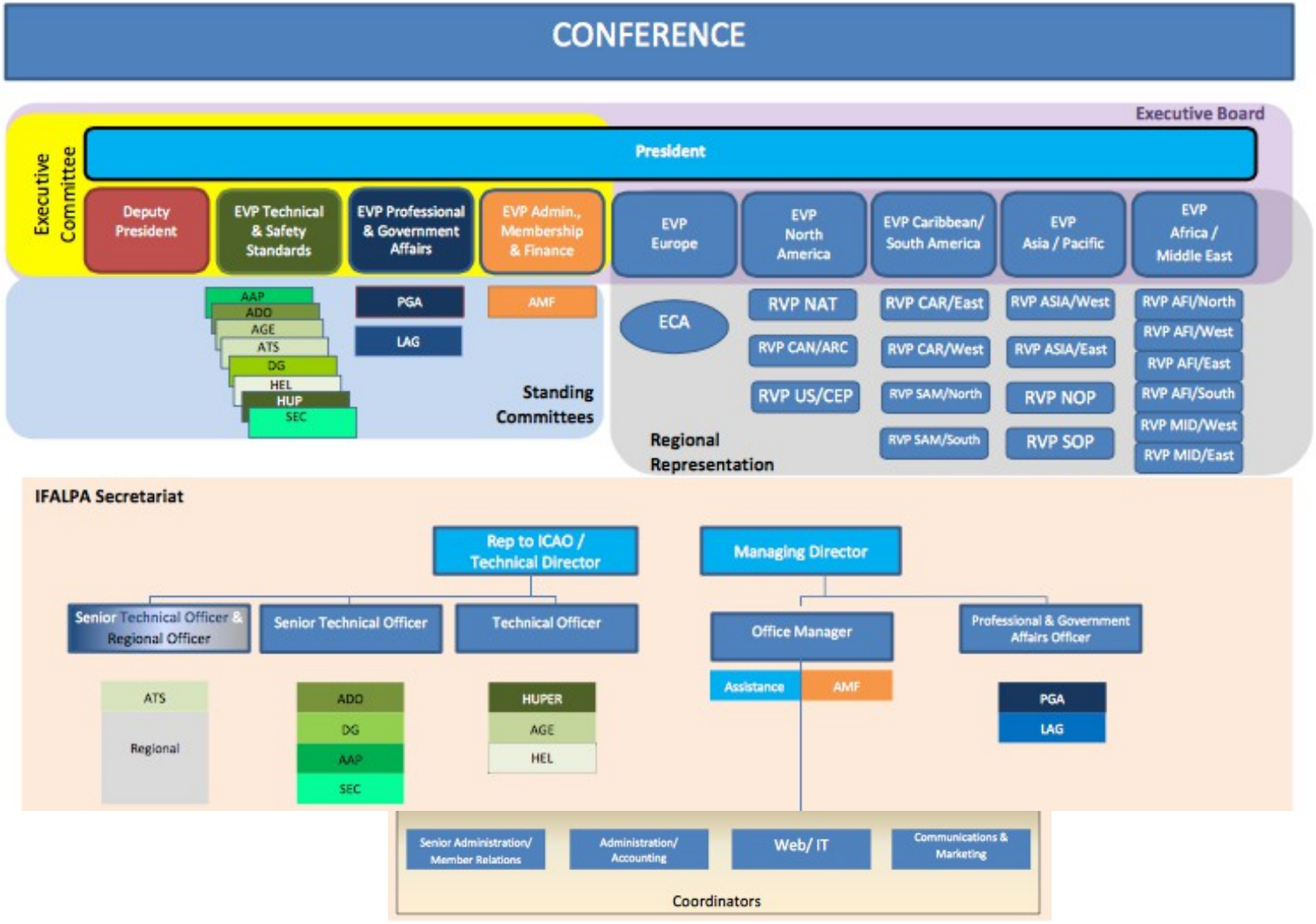
ECA

European Cockpit Association

IFALPA
The Global Voice of Pilots

SINDICATO ESPAÑOL DE PILOTOS
SEPLA
DE LINEAS AÉREAS

EASA
European Aviation Safety Agency


CONFERENCE
Executive Board
Executive Committee
President
Deputy President
EVP Technical & Safety Standards
EVP Professional & Government Affairs
EVP Admin., Membership & Finance
EVP Europe
EVP North America
EVP Caribbean/ South America
EVP Asia / Pacific
EVP Africa / Middle East
AAP
ADO
AGE
ATS
DG
HEL
HUP
SEC
PGA
LAG
AMF
Standing Committees
ECA
RVP NAT
RVP CAN/ARC
RVP US/CEP
RVP CAR/East
RVP CAR/West
RVP SAM/North
RVP SAM/South
RVP ASIA/West
RVP ASIA/East
RVP NOP
RVP SOP
RVP AFI/North
RVP AFI/West
RVP AFI/East
RVP AFI/South
RVP MID/West
RVP MID/East
Regional Representation
IFALPA Secretariat
Rep to ICAO / Technical Director
Managing Director
Senior Technical Officer & Regional Officer
Senior Technical Officer
Technical Officer
Office Manager
Professional & Government Affairs Officer
ATS
Regional
ADO
DG
AAP
SEC
HUPER
AGE
HEL
Assistance
AMF
PGA
LAG
Senior Administration/ Member Relations
Administration/ Accounting
Web/ IT
Communications & Marketing
Coordinators

AAP

Accident Analysis & Prevention

AMF

Administration, Membership & Finance

ADO

Aircraft Design and Operation

AGE

Aerodrome & Ground Environment

ATS

Air Traffic Services

DG

Dangerous Goods

HEL

Helicopters

HUP

Human Performance

LAG

Legal Advisory Group

PGA

Professional & Government Affairs

SEC

Security

HELICOPTER COMMITTEE

HEL

- Advises the EB about all aspects of Helicopters issues and matters.
- Cover all commercial helicopter operations:
  - HEMS
  - SAR
  - CAT: Off-shore / Corporate
  - Training
  - Aerial Works

HEL

- Since 2009 ECA stablished a HeliWG.
- ECA HeliWG meets 3-4 times a year.
- Supported by SEPLA in 2012 we decide to merge ECA HeliWG + IFALPA Helcom.
- Share and colaborate.
- Worldwide issues.

Total success!!

All of us

Capt. Tony Ridley
Chairman

Capt. Jeff Smith
Vice Chairman

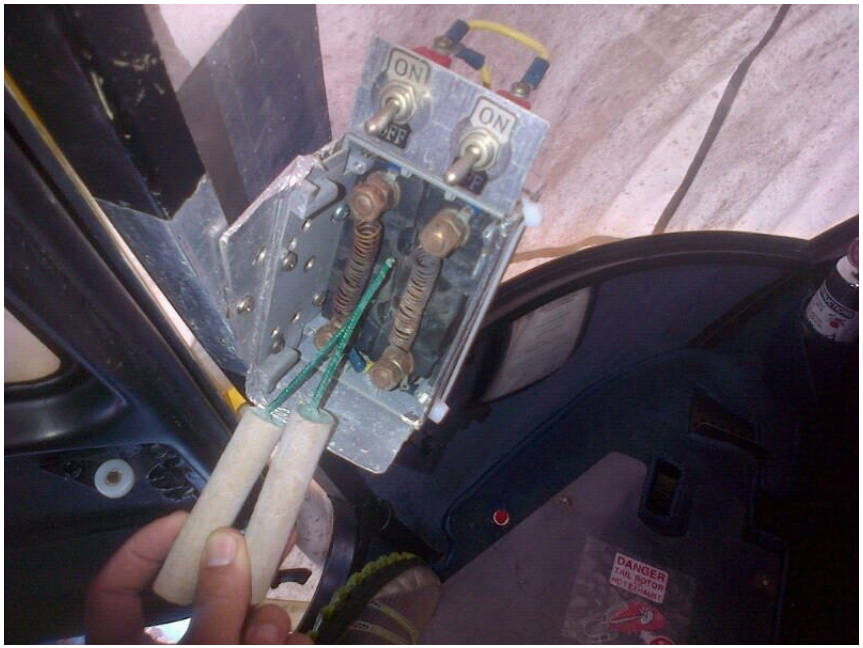
Capt. David Abad
Vice Chairman

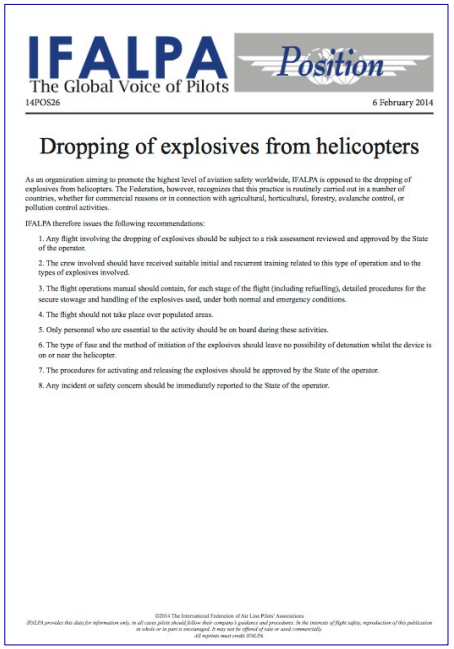
HEL “Hot Topic” List

- RPAS.
- Ergonomics.
- Off Shore Alternates.
- Survival protection equipment.
- Training and recency requirments.
- Simulation training standards.
- Cockpit video surveillance.
- Off airfield, on ground security of aircraft.
- FTL and FDT.
- NVIS.
- Regulatory.

Global results

- Tuna fishing ops using explosives in Panama.
- Lack of legislation.
- Collaboration.
- Position.
- Policy





IFALPA The Global Voice of Pilots — Position

14POS26 — 6 February 2014

Dropping of explosives from helicopters

As an organization aiming to promote the highest level of aviation safety worldwide, IFALPA is opposed to the dropping of explosives from helicopters. The Federation, however, recognizes that this practice is routinely carried out in a number of countries, whether for commercial reasons or in connection with agricultural, horticultural, forestry, avalanche control, or pollution control activities.

IFALPA therefore issues the following recommendations:

1. Any flight involving the dropping of explosives should be subject to a risk assessment reviewed and approved by the State of the operator.
2. The crew involved should have received suitable initial and recurrent training related to this type of operation and to the types of explosives involved.
3. The flight operations manual should contain, for each stage of the flight (including refuelling), detailed procedures for the secure stowage and handling of the explosives used, under both normal and emergency conditions.
4. The flight should not take place over populated areas.
5. Only personnel who are essential to the activity should be on board during these activities.
6. The type of fuse and the method of initiation of the explosives should leave no possibility of detonation whilst the device is on or near the helicopter.
7. The procedures for activating and releasing the explosives should be approved by the State of the operator.
8. Any incident or safety concern should be immediately reported to the State of the operator.

International Federation of Air Line Pilots' Associations

IFALPA

The Global Voice of Pilots

GRACIAS

If you need us or want to join our TEAM, contact us:

Capt. David Abad
davidabad@mac.com

WFP

World Food Programme

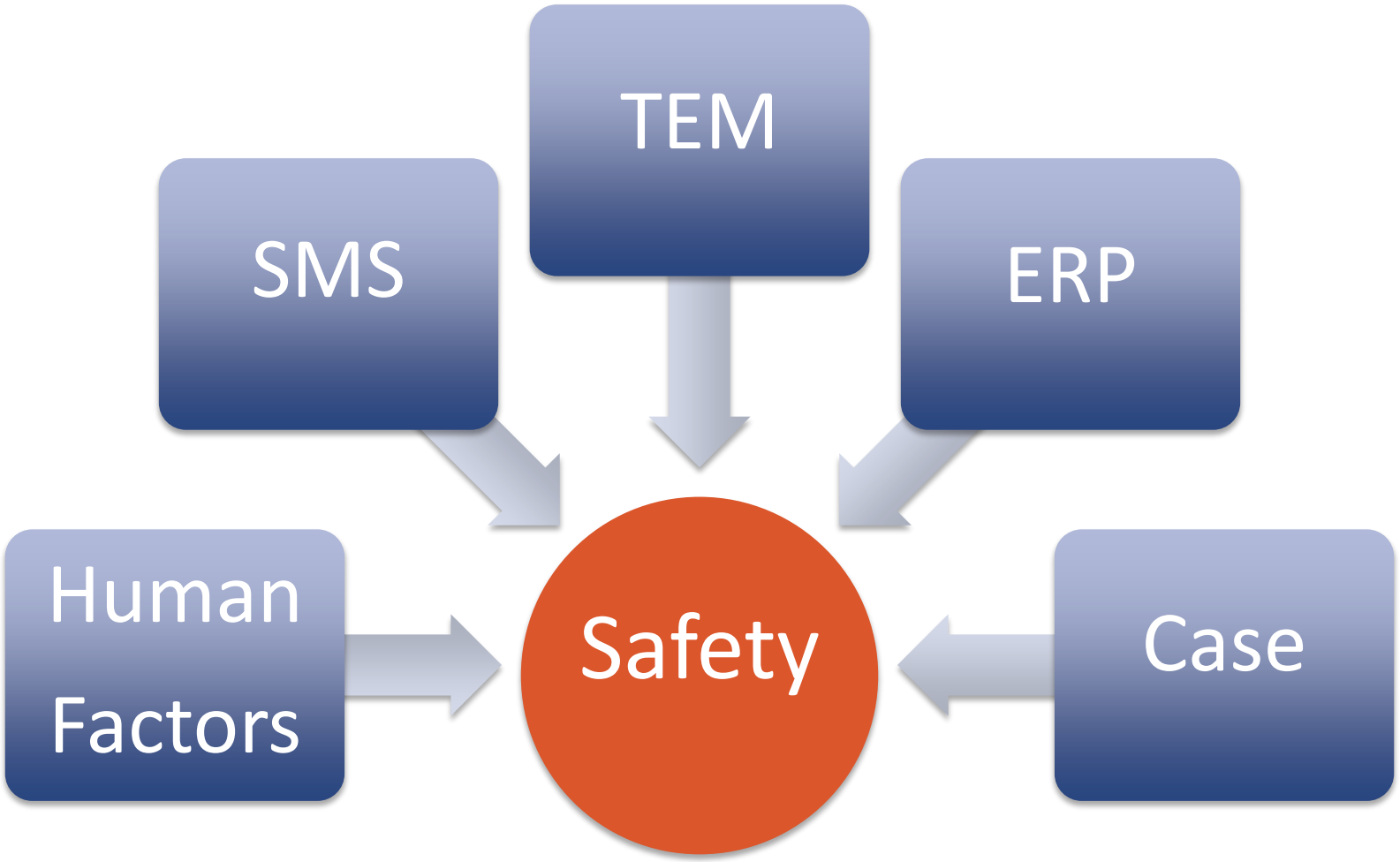
wfp.org

Human Factors

WFP – Safety Workshop

4th- 5th of February, Kathmandu, Nepal

Let's talk about…



My objetive:

Pilot as the key element in Flight Safety

Agenda

- Statistics.
- HF and Error.
- Leadership.
- Fatigue and Stress
- Communication.

STATISTICS

IHST

International Helicopter Safety Team

Our Goal is to Reduce the Civil Helicopter Accident Rate by 80% by 2016.

Accident Rates Vary by Region of the World

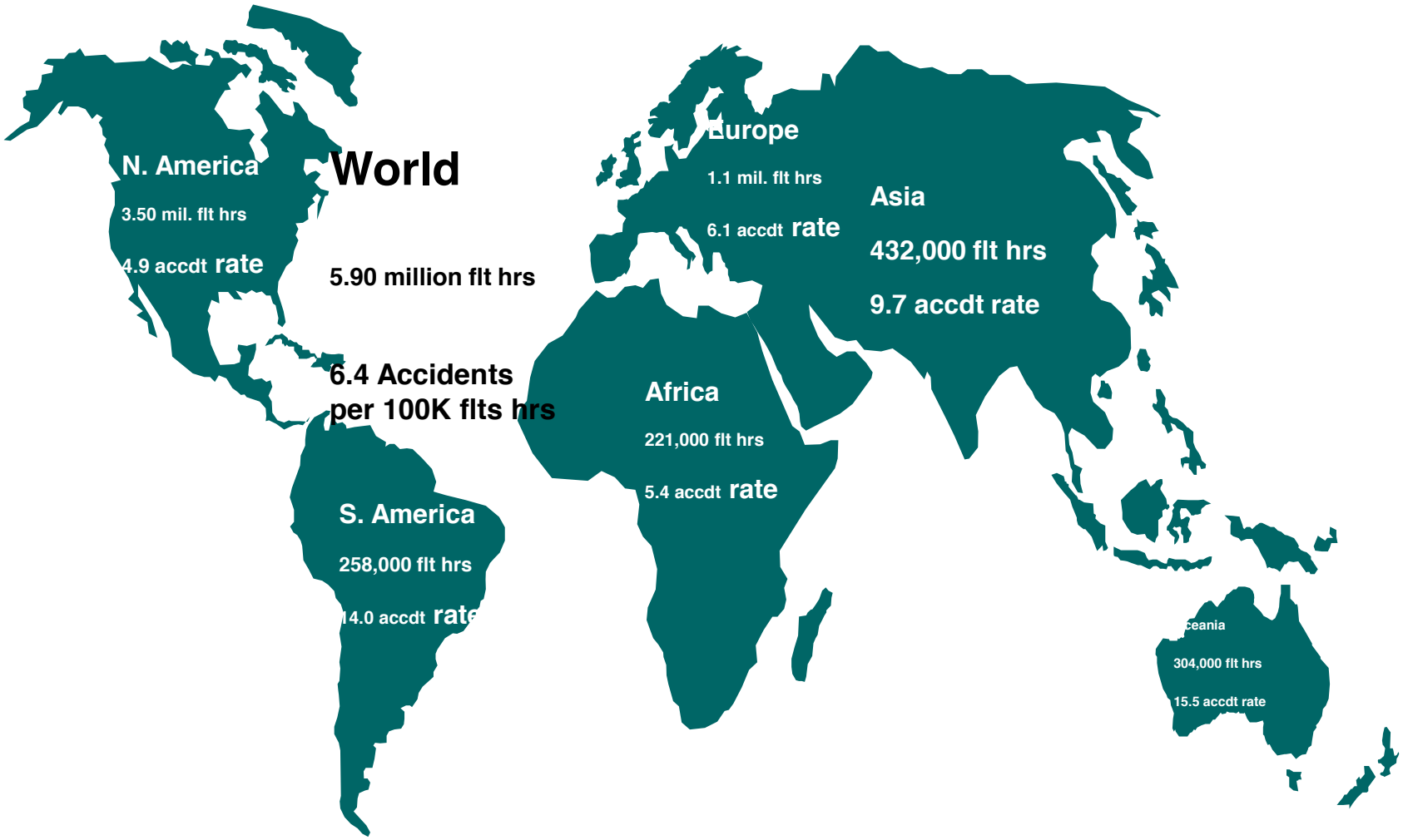
Civil registered helicopter accidents and flight hours from IHST data

Pre-IHST (2001-2005) accident rates vs. 2011 thru September accident rates

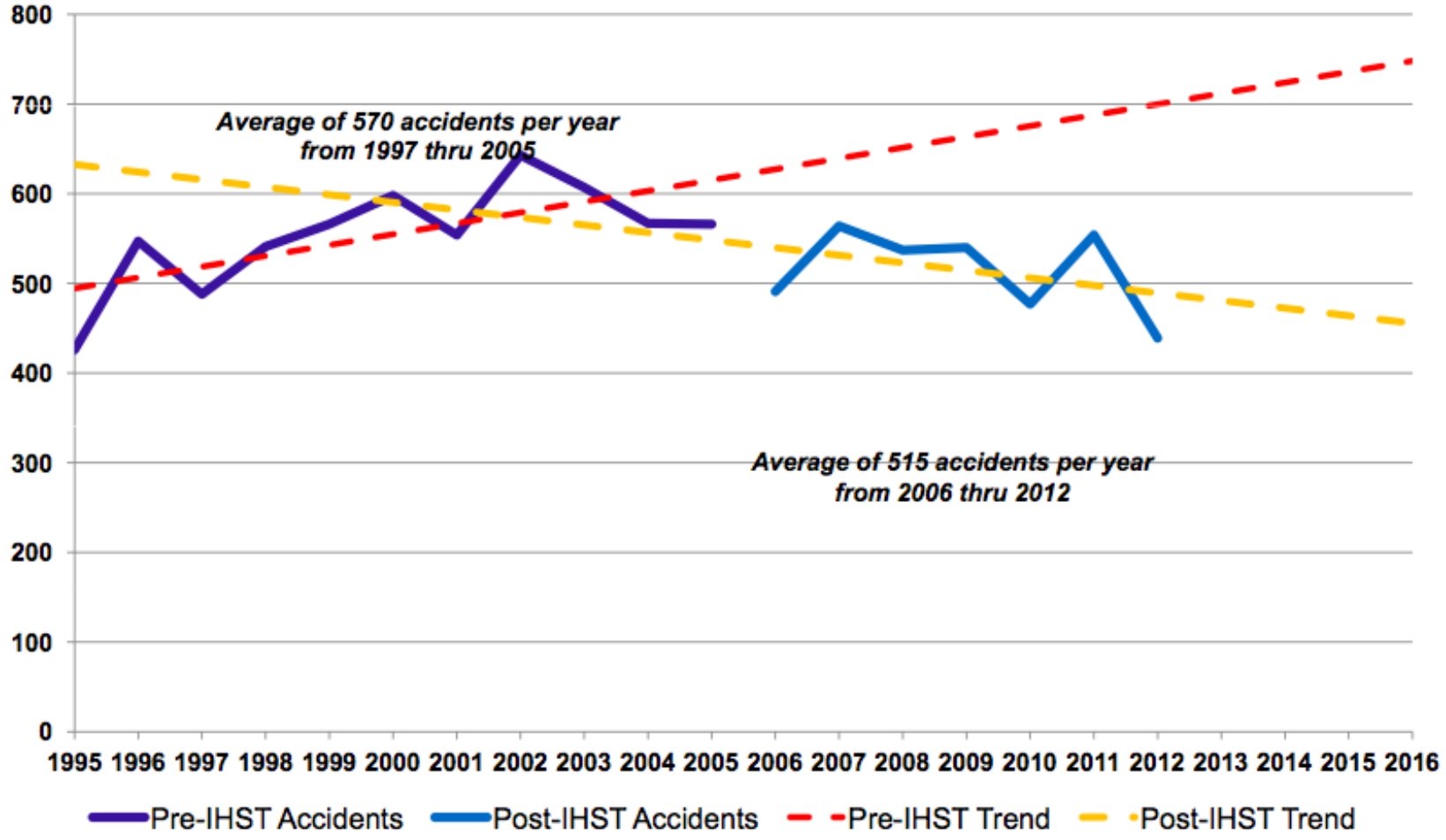
Accuracy of flight hour exposure estimate improves every year.

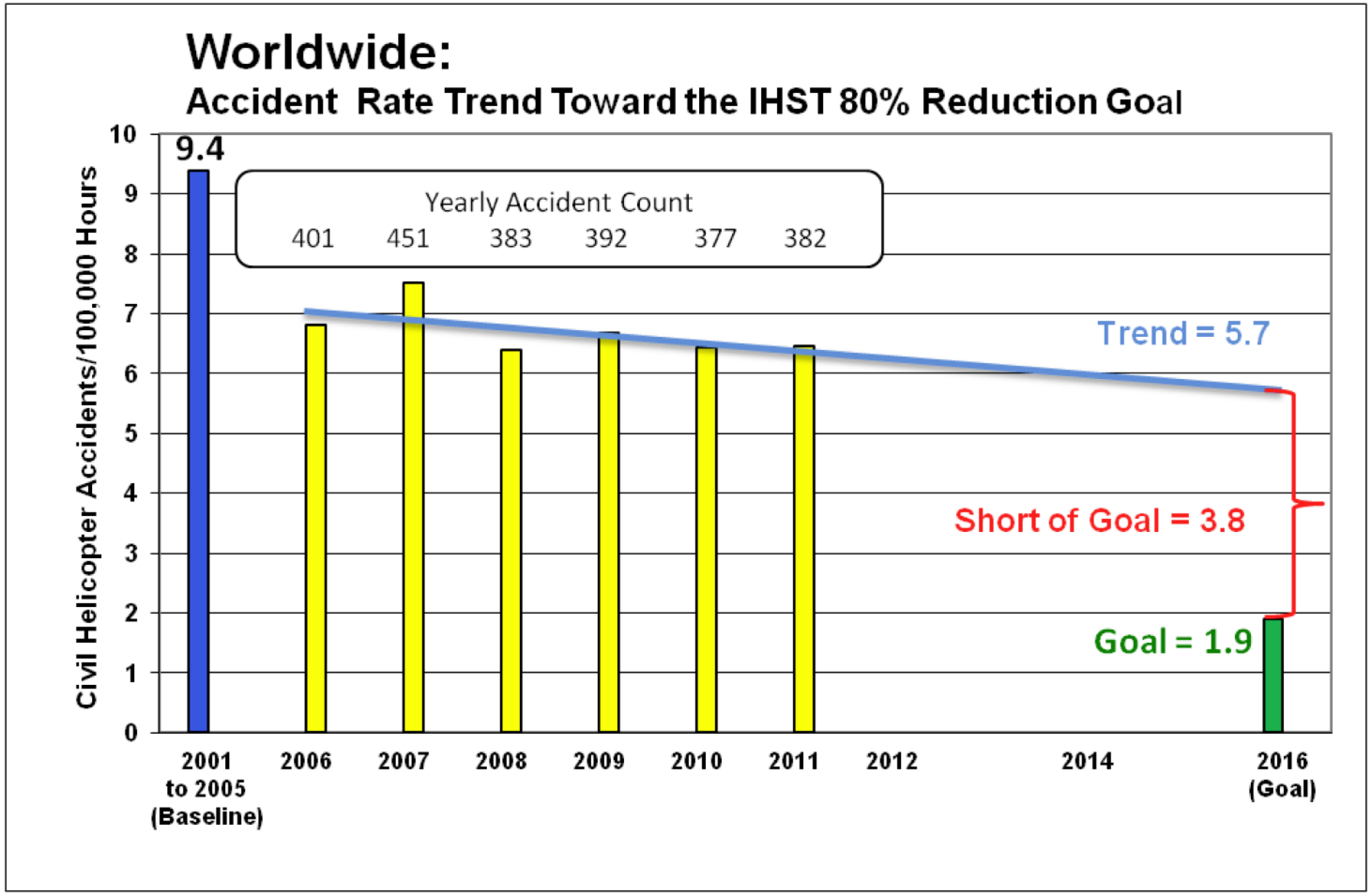
20 October 2011

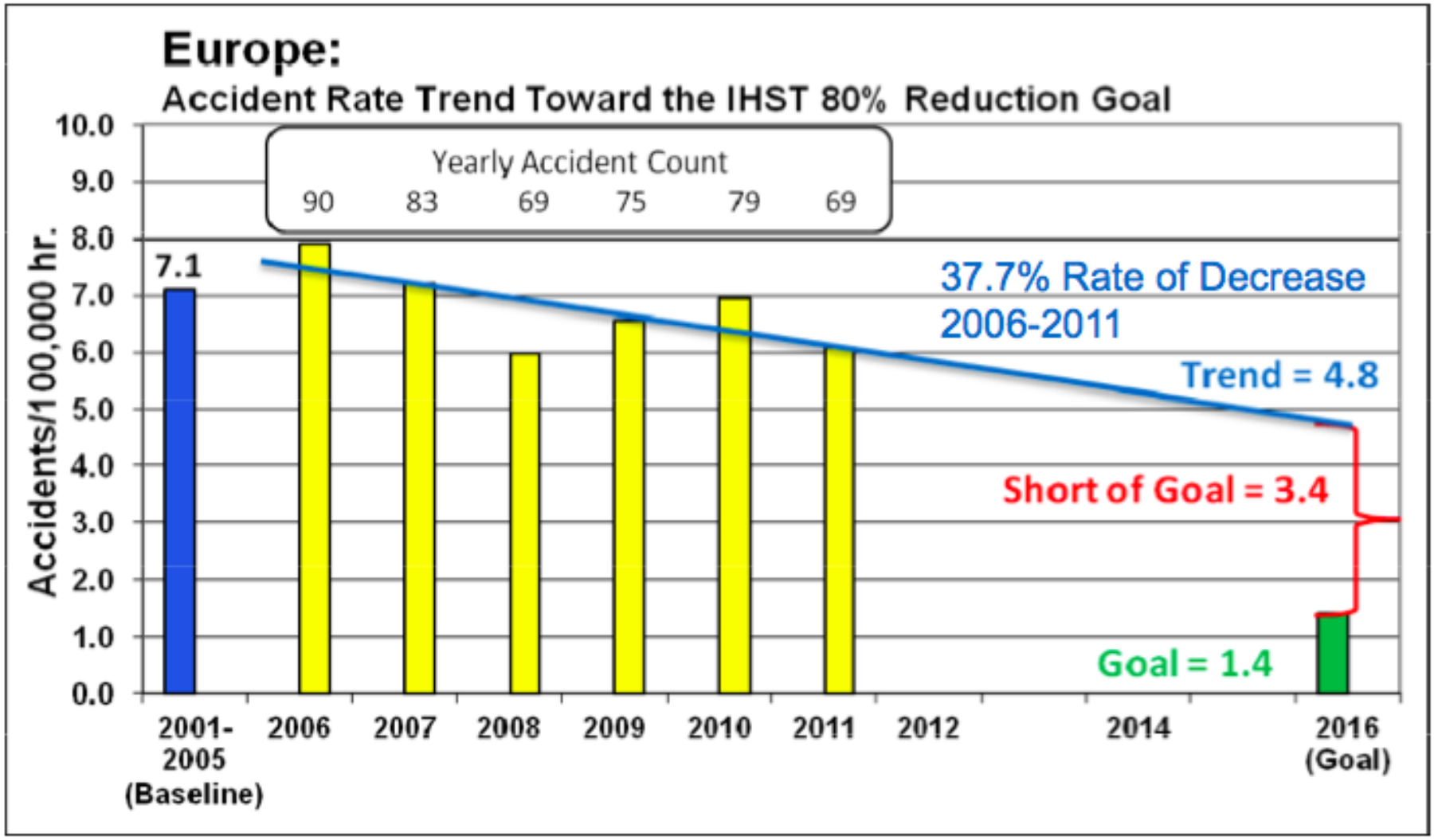
Flight hours worldwide



Worldwide Civil Helicopter Accidents



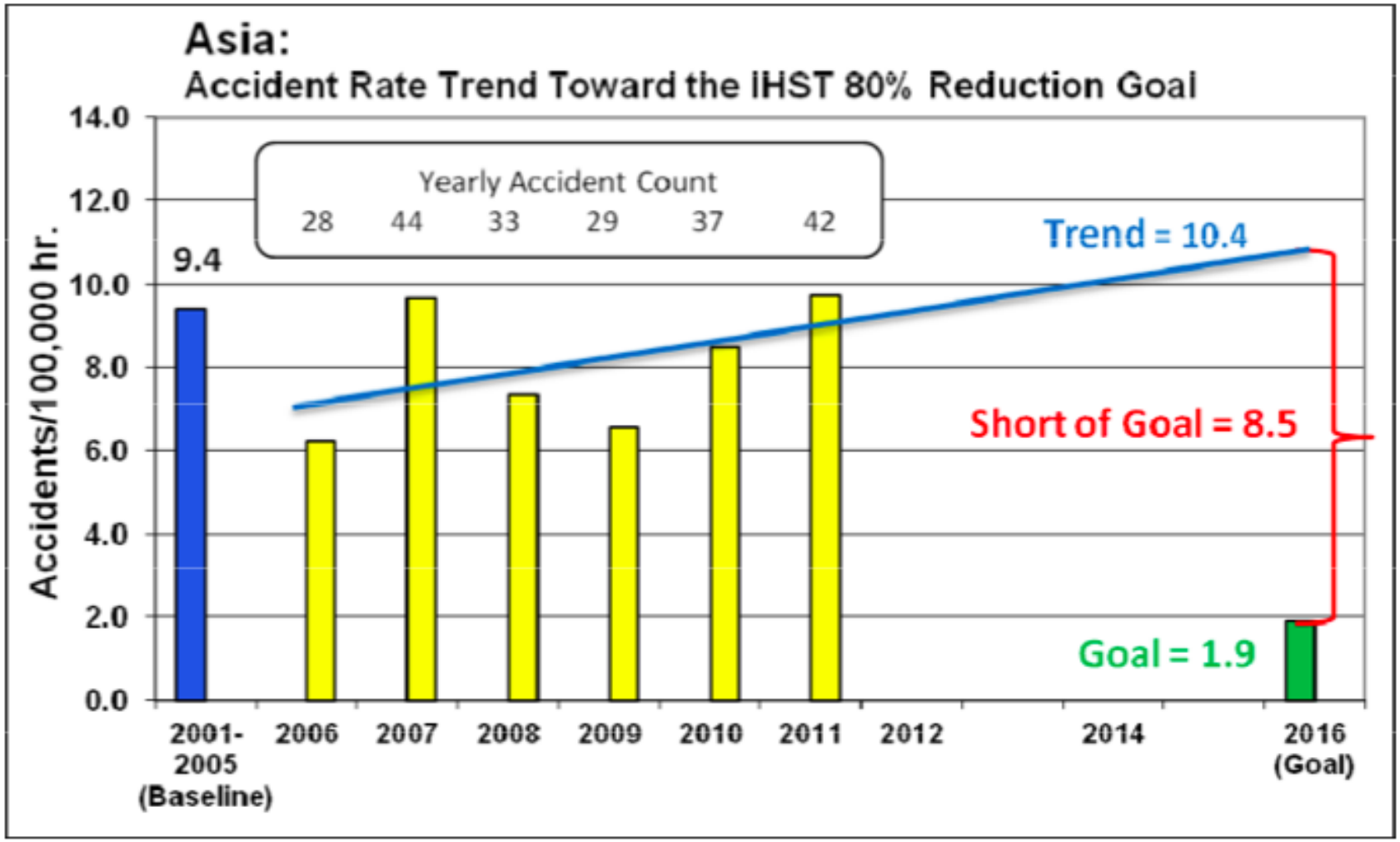

Worldwide:
Accident Rate Trend Toward the IHST 80% Reduction Goal
Civil Helicopter Accidents/100,000 Hours
10
9
8
7
6
5
4
3
2
1
0
9.4
Yearly Accident Count
401 451 383 392 377 382
Trend = 5.7
Short of Goal = 3.8
Goal = 1.9
2001 to 2005 (Baseline)
2006
2007
2008
2009
2010
2011
2012
2014
2016 (Goal)


Europe:
Accident Rate Trend Toward the IHST 80% Reduction Goal
Yearly Accident Count
90
83
69
75
79
69
7.1
37.7% Rate of Decrease
2006-2011
Trend = 4.8
Short of Goal = 3.4
Goal = 1.4
Accidents/100,000 hr.
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2001-2005 (Baseline)
2006
2007
2008
2009
2010
2011
2012
2014
2016 (Goal)

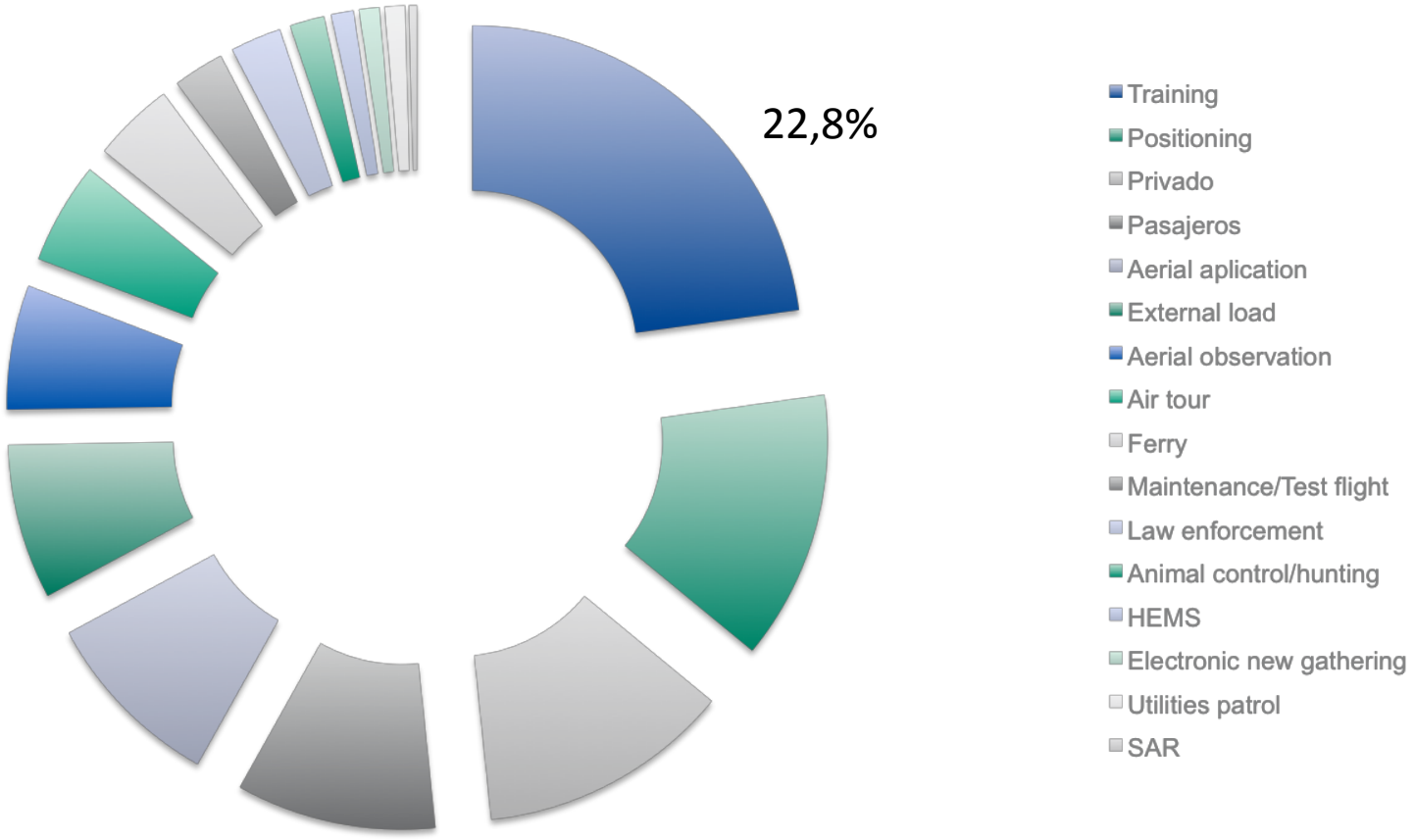
IHST

International Helicopter Safety Team

Our Goal is to Reduce the Civil Helicopter Accident Rate by 80% by 2016.



Accident rate by mision



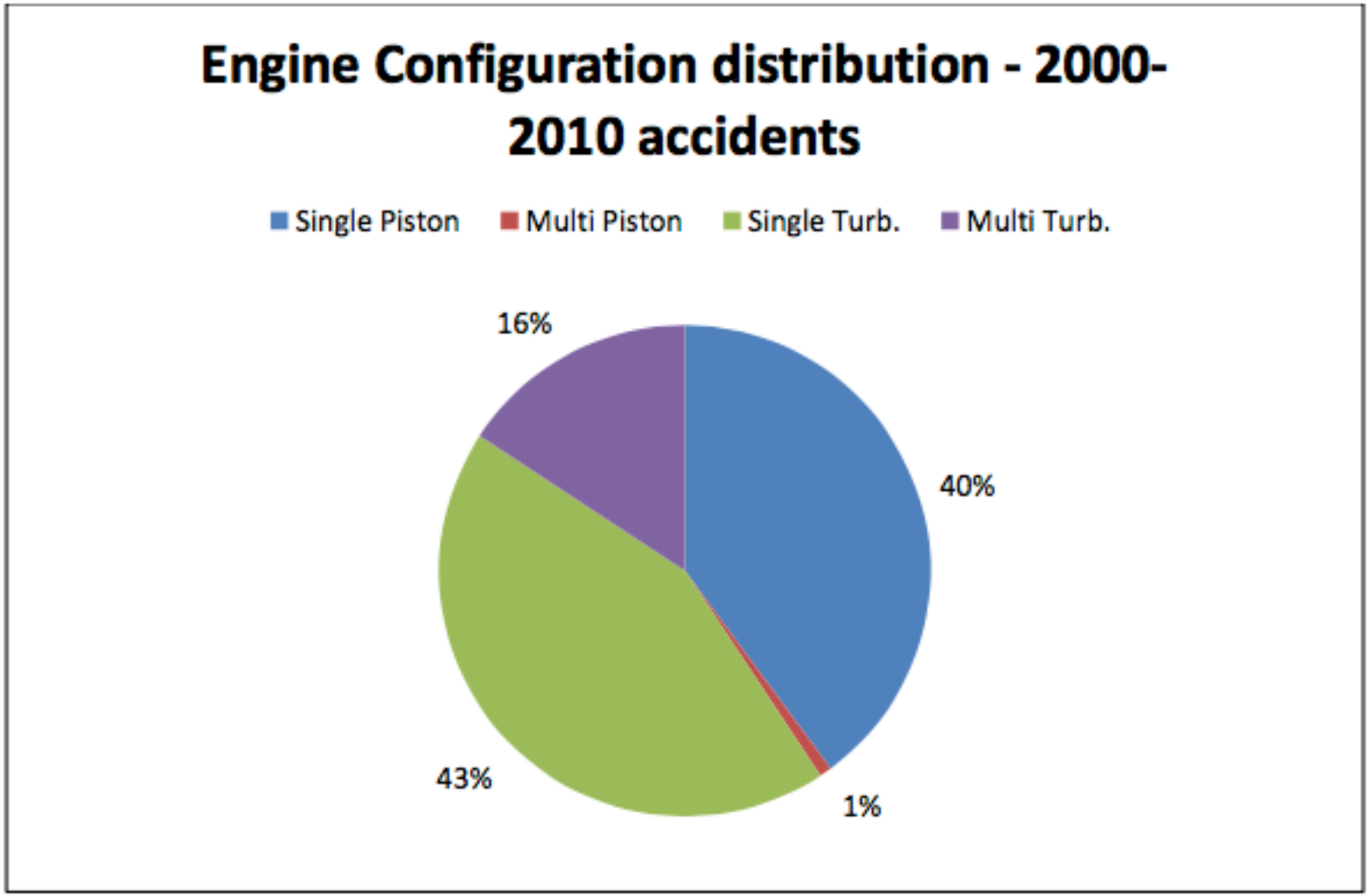
Soruce: IHST

Aerial works

Occurrence Category	Accidents and SIs	
	2004-2013 average	2014
LALT: Low altitude operations	9.3	3
LOC-I: Loss of control - inflight	7.0	4
EXTL: External load related occurrences	4.2	2
SCF-PP: Powerplant failure or malfunction	3.9	1
OTHR: Other	3.1	1
SCF-NP: System/component failure or malfunction [non-powerplant]	2.0	1
F-POST: Fire/smoke (post-impact)	2.0	0
FUEL: Fuel related	1.4	0
CTOL: Collision with obstacle(s) during take-off and landing	1.2	1
ARC: Abnormal runway contact	1.0	2
LOC-G: Loss of control - ground	1.1	0
CFIT: Controlled flight into or toward terrain	0.9	0

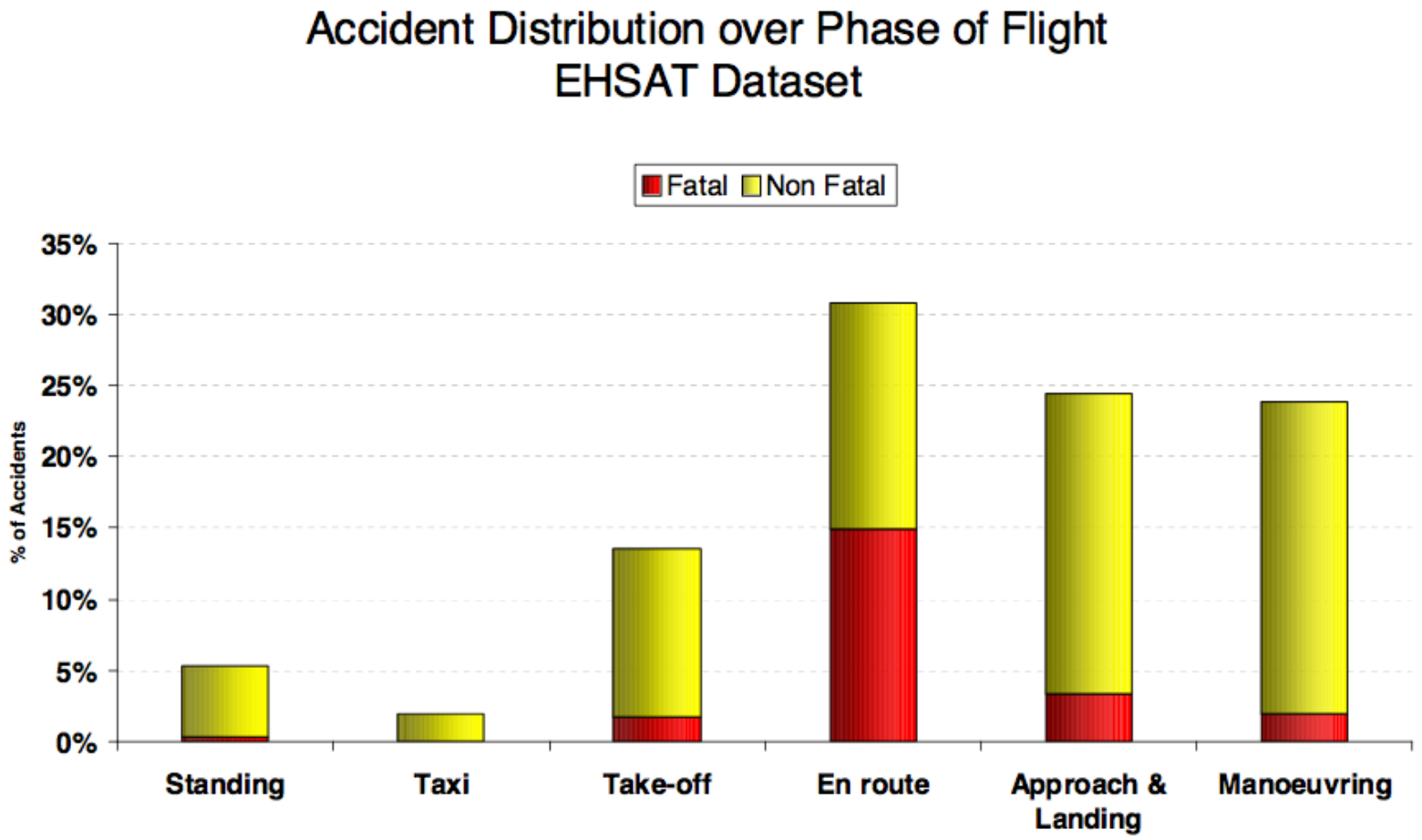
Soruce: EASA Satey Review, 2014

Accident rate by engine configuration



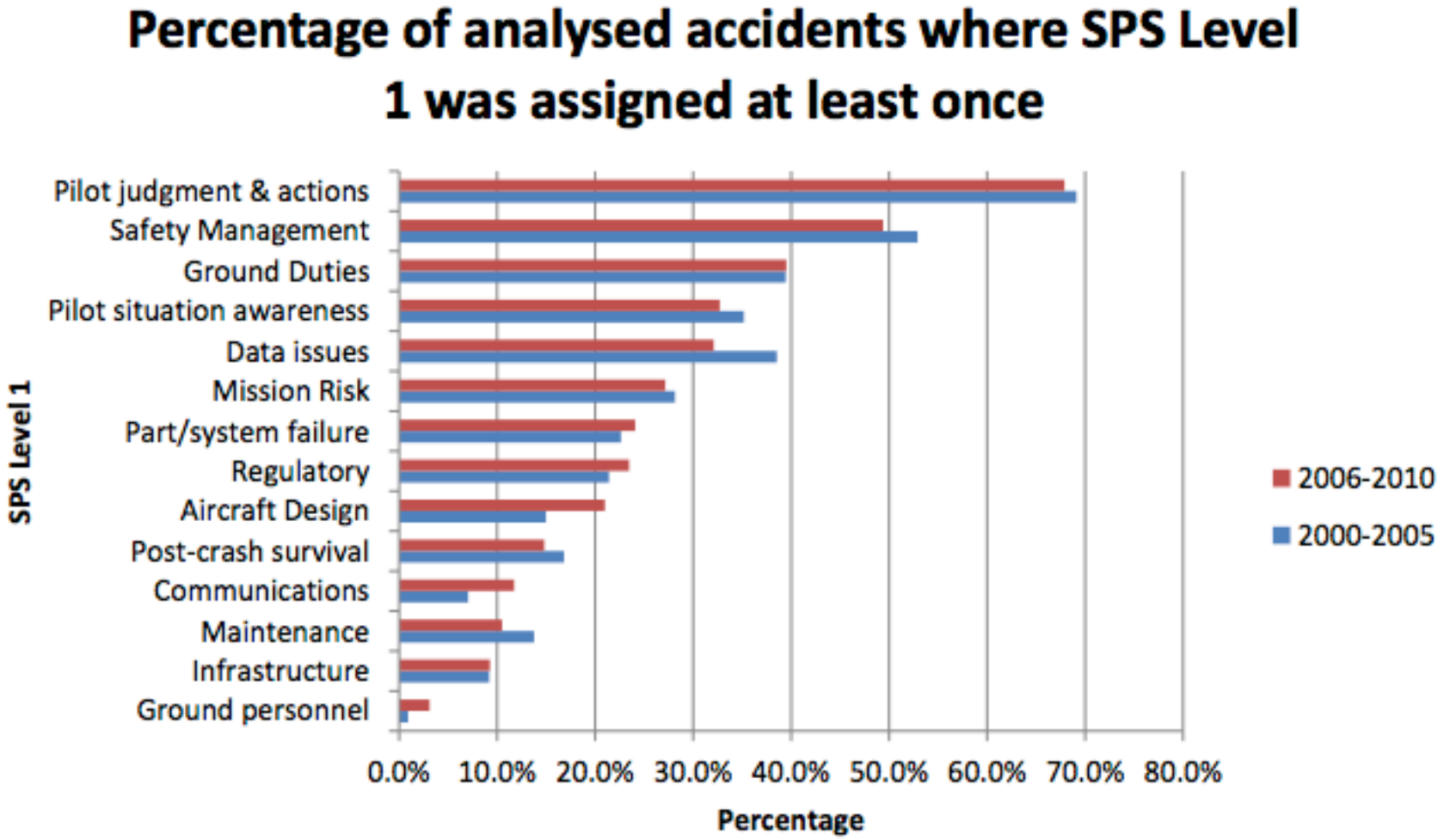
Source: "*EHEST analysis of 2000-2010 european helicopter accidents*"

Accidents by flight fase



Source: "*EHEST analysis of 2000-2010 european helicopter accidents*"

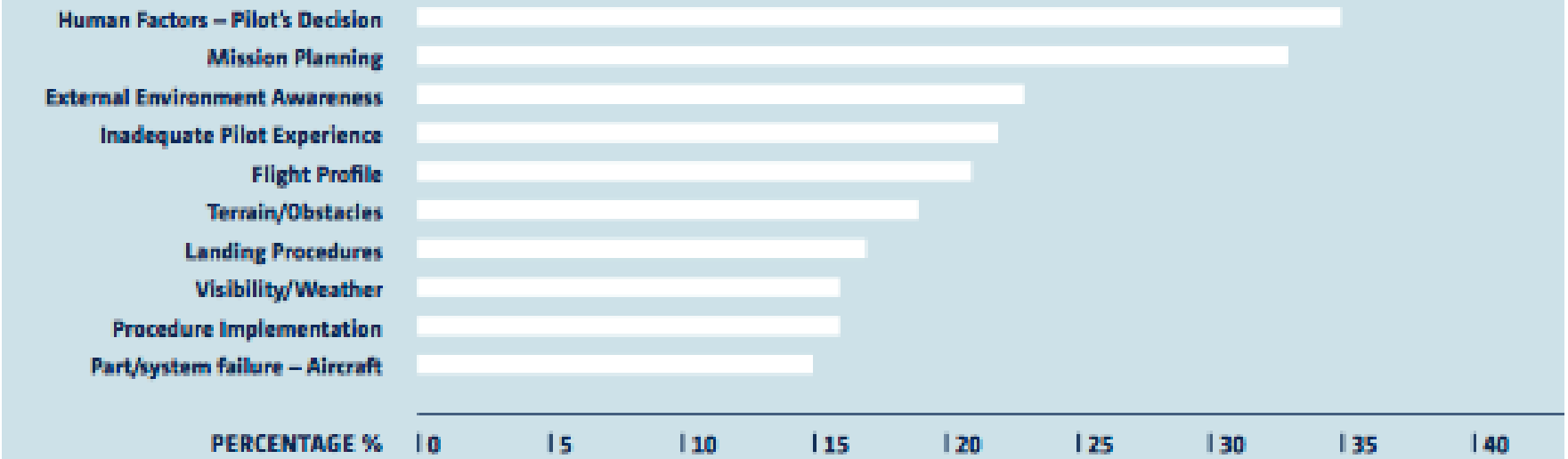
EHSAT Analysis



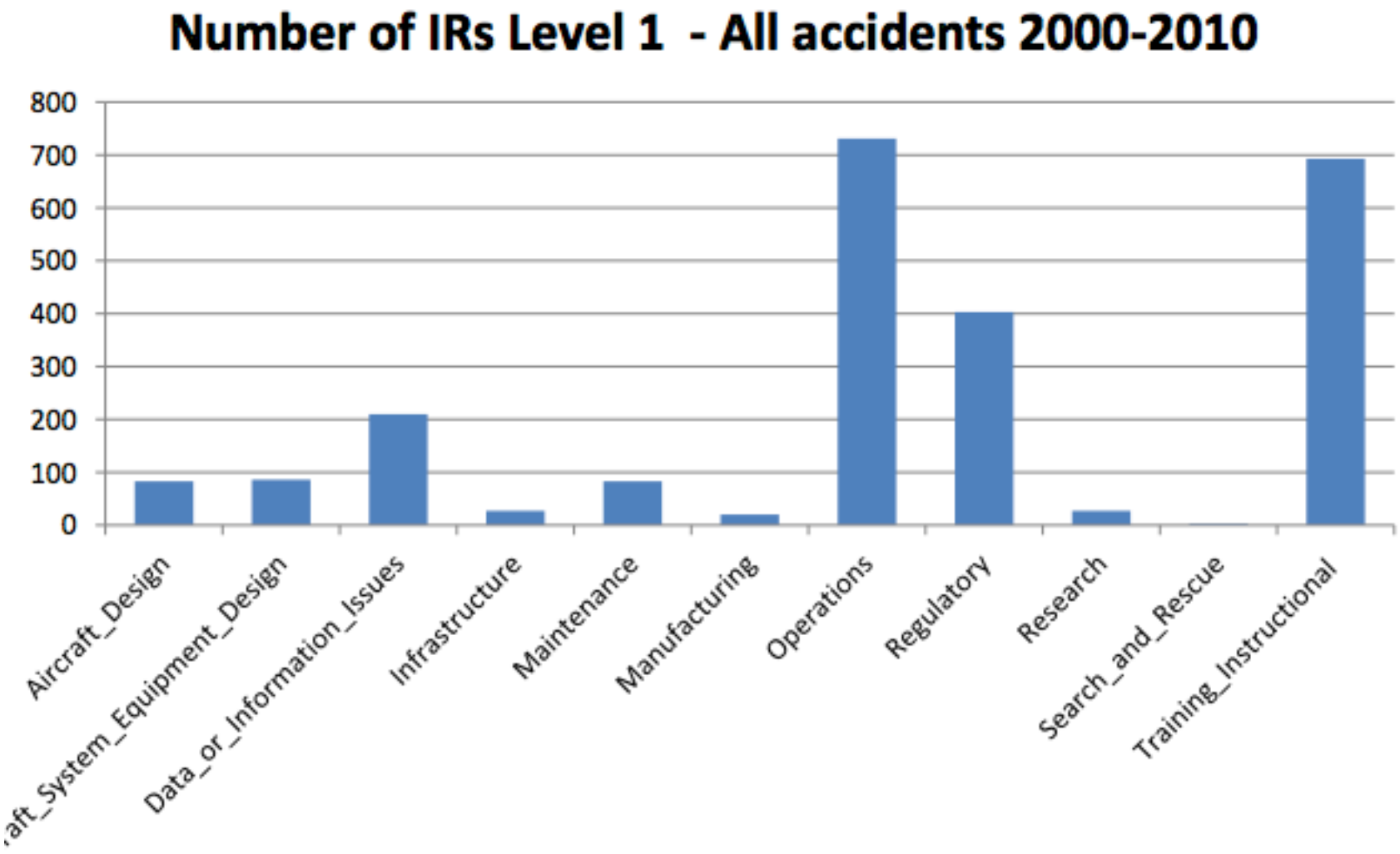
EHSAT Analysis

FIGURE 11

PERCENTAGE OF ACCIDENTS IN DATASET
IN WHICH SPS CATEGORY (LEVEL 2) WAS IDENTIFIED AT LEAST ONCE
(TOP 10, EXCLUDING FACTORS RELATED TO DATA ISSUES)



EHSAT Analysis



HUMAN FACTORS AND ERRORS

Why Human Factors?

- FCL, UE Reglaments.
- Error.
- Tool.
- Excellence.
- Effectiveness.
- Risks.
- Culture.

HF introduction and Definitions

- “We can’t avoid human error, but we certainly can reduce the frequency of it’s apperance and ensure that its consequences are minimal.”
- Effective use of ALL available resources to achieve efficient and safe flight operations. 1984, John Lauber, Ames Research Center, NASA
- Behavior training in order to recognize safety threats, avoid errors and manage errors committed. Bob Helmerich

¿CRM?

Effective use of **ALL** available resources to achieve efficient and safe flight operations, plus…

Effective

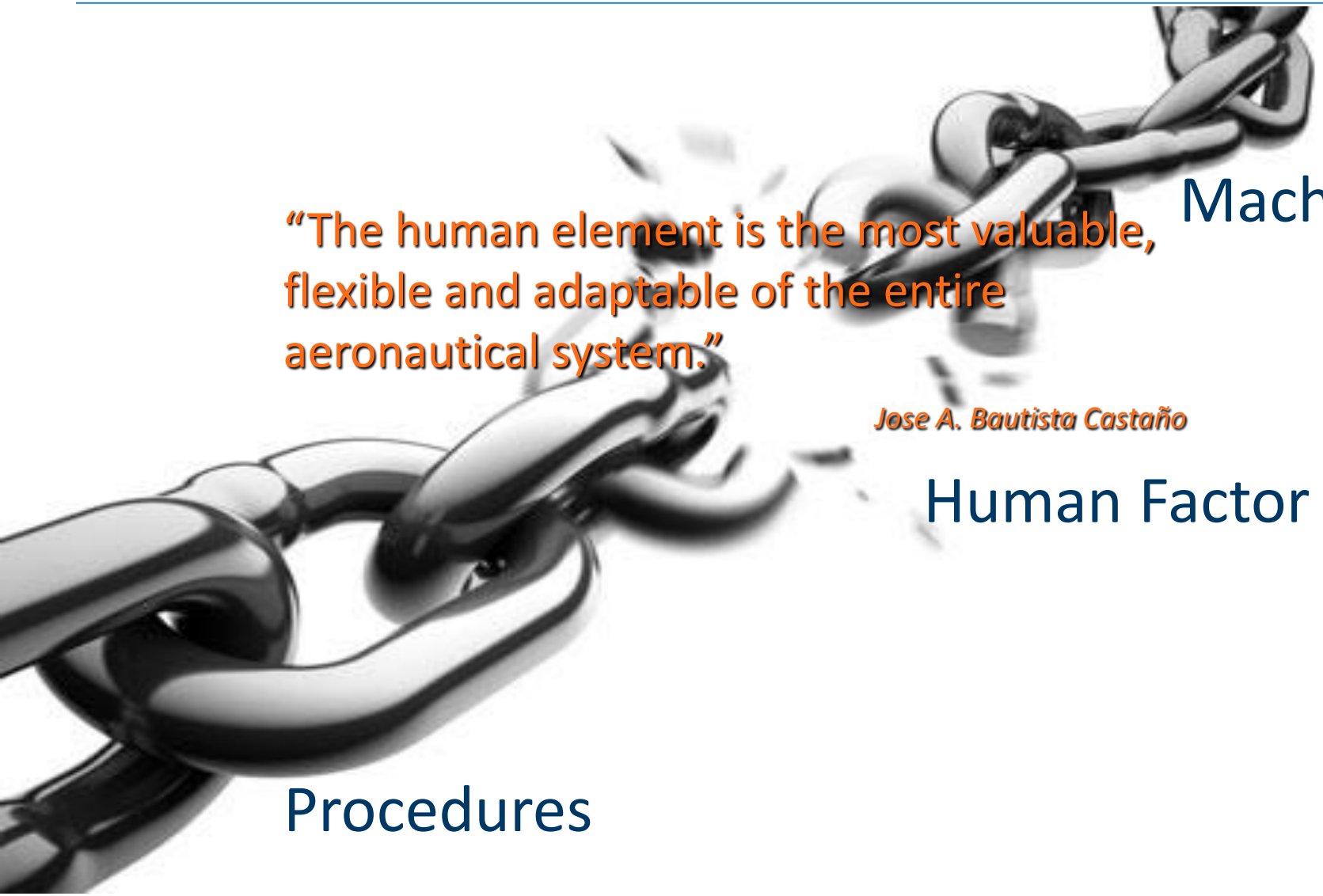
VS

Efficient

Effectiveness

Only someone who knows how to combine effective and efficiency manages to become real professional…

Chain of Errors



"The human element is the most valuable, flexible and adaptable of the entire aeronautical system."

Jose A. Bautista Castaño

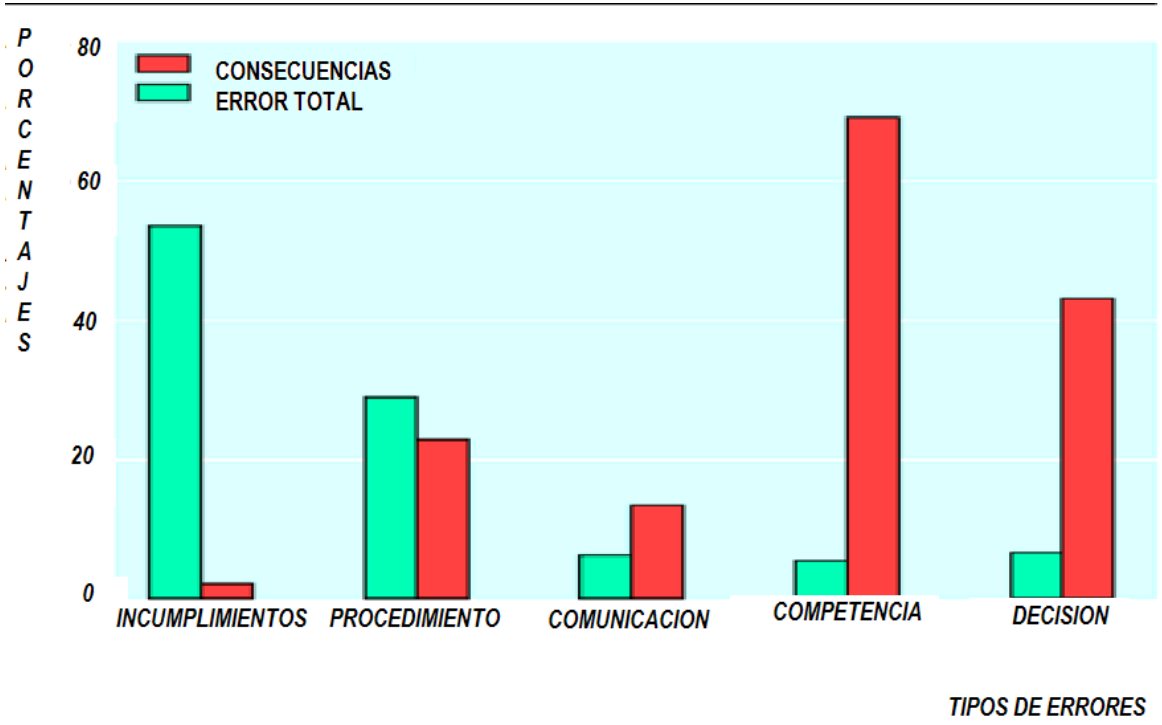
Machine

Human Factor

Procedures

Types of errors

- Deliberate non-compilance = Violation.
- Of procedures.
- Of communication.
- Of competency.
- Decision errors.



Violations

Error vs Violation

- Are those “mistakes” or acctions we make, knowing that do not conform to rules, procedures or legislation, even are against them…
- Errors are related to the processing of information, failures, loss of attention, lack of knowledge…
- Errors are unintentional.
- Violations have to do with problems of motivation, lack of reward, lack of supervision/sanctions, ego, even self pressures.
- Violations are premeditated.

Table 1 Why People Don't Follow Procedures

"Procedures are not used because...		%agreeing
Accuracy	..they are inaccurate	21
	..they are out-of-date	45
Practicality	..they are unworkable in practice	40
	..they make it more difficult to do the work	42
	..they are too restrictive	48
	..they are too time consuming	44
	..if they were followed 'to the letter' the job couldn't be done in time	62
Optimisation	..people usually find a better way of doing the job	42
	..they do not describe the best way to carry out the work	48
Presentation	..it is difficult to know which is the right procedure	32
	..they are too complex and difficult to use	42
	..it is difficult to find the information you need within the procedure	48
Accessibility	..it is difficult to locate the right procedure	50
	..people are not aware that a procedure exists for the job they are doing	57
Policy	..people do not understand why they are necessary	40
	..no clear policy on when they should be used	37
Usage	..experienced people don't need them	19
	..people resent being told how to do their job	34
	..people prefer to rely on their own skills and experience	72
	..people assume they know what is in the procedure	70


AVOID ERRORS
ERROR DETECTION
CATCH ERROR
MITIGATE ERRORS
DEBRIEF
LIDERSHIP
STRESS
FATIGUE
SA
DECISION MAKING
ORM
TRAINING

LEADERSHIP

The aim of leadership

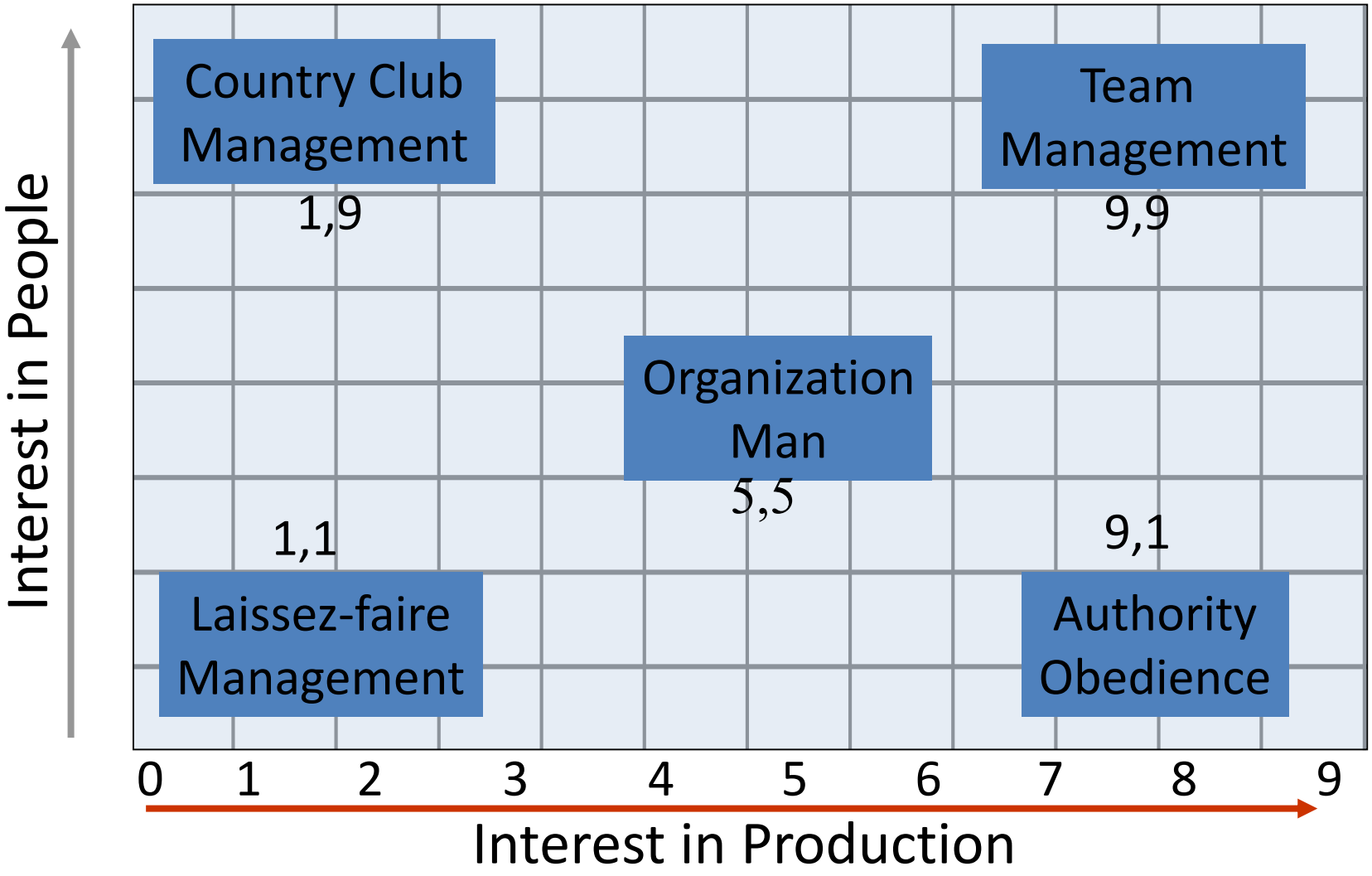
Leadership

- We can have an excellent planning, monitoring and SOP in our operations and disappear for lack of a proper LEADER… (Fco Javier Mendi Pompa).
- Personality traits are innate or acquired in the early stages of life.
- Are very stable and resistance to change carachteristics.
- Studies demostrate the incidence of personality in air accidents.
- Ideally, in the selection of futures pilots, inadequate personalities or traits should be detected and discarded.
- Attitudes can be influenciate by training and persuasion (safety briefings and workshops, well conducted debriefings…).

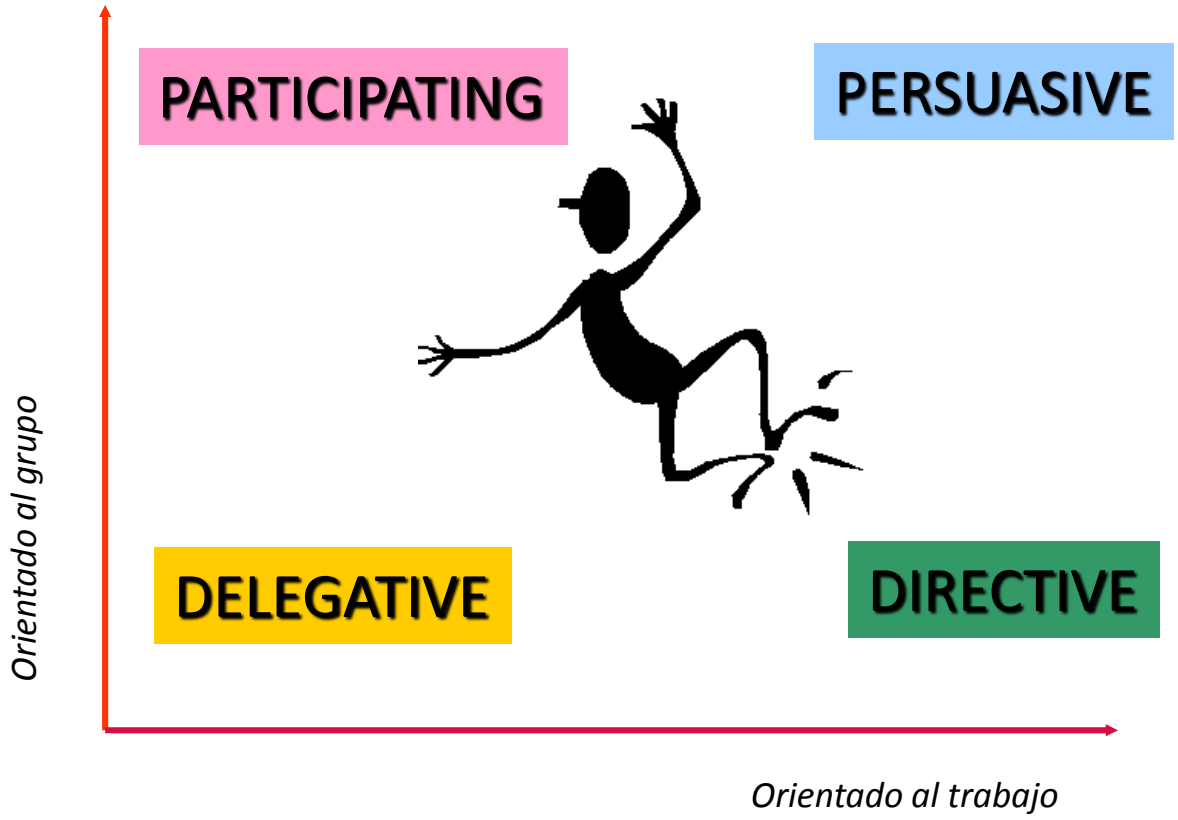
Leadership

- Main difference between leader and boss is the origin of its AUTHORITY
- Bosses, authority is granted by the organization, it is a formal authority.
- You obey the boss, you follow the leader!
- Newcomers or younger pilots reflects their instructors…

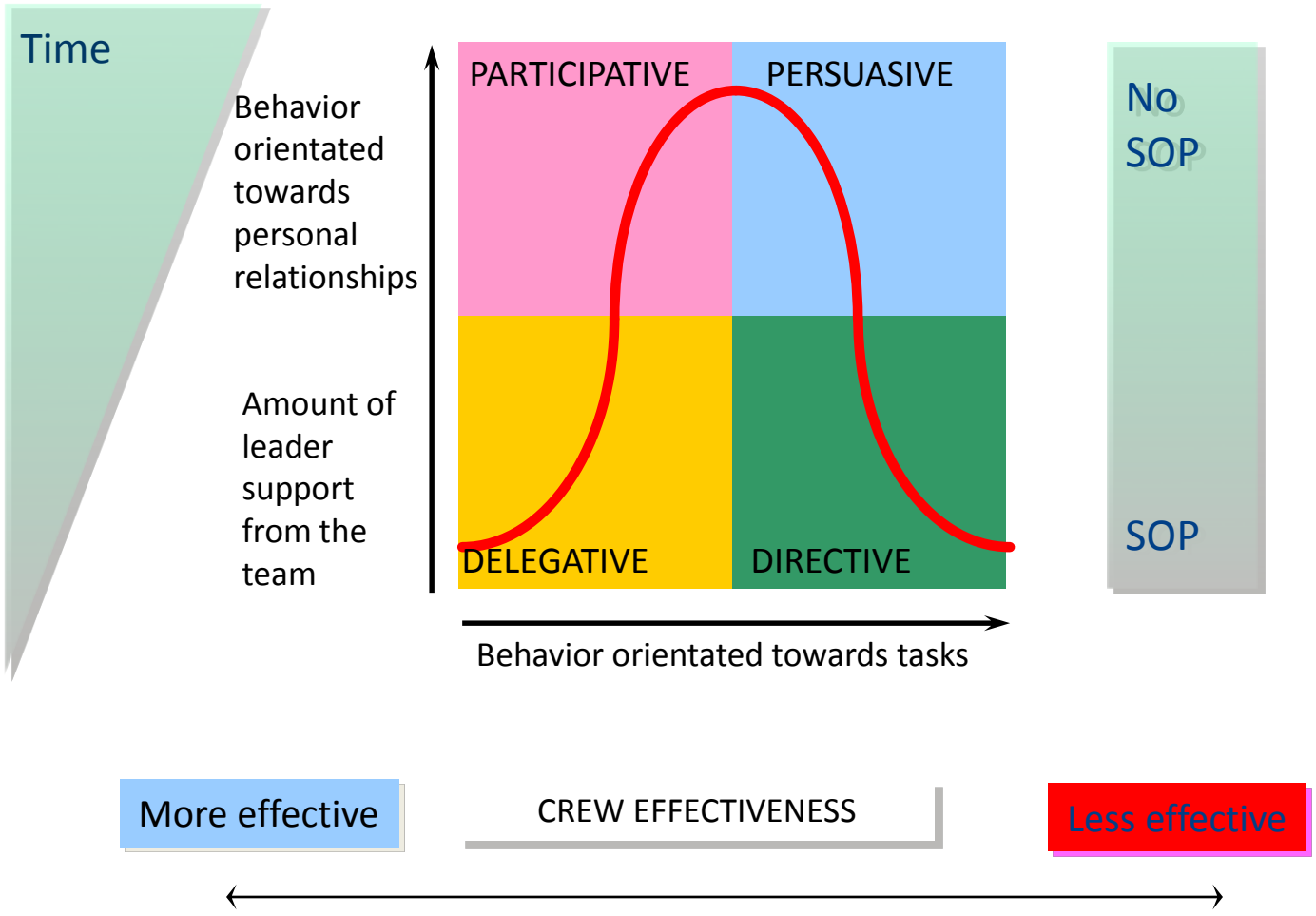
Leadership matriz



Leadership in aviation



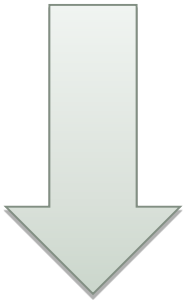
Leadership Styles



FATIGUE AND STRESS

Fatigue and Stress

We must be able to manage fatigue and stress when we are part a flight crew, even if we don't do it in our daily lives…



Even more in complex environments

What is fatigue?

Decreased physical capacity of the individual after completion of a job for a certain time; his tiredness, depression resulting from a period of anxiety, exposure to harsh environments or lack of sleep.

Types of fatigue

- **Physiological:** related to the contribution of muscular energy and eliminating toxins. The cause: the failure of diet, lack of oxygen, the contraction of muscles and tendons, insufficient blood flow**.**

- **Psychic**: feelings of lassitude, changes in moral and disability. The cause lack of motivation of individuals.

- **Chronic fatigue**: The existence of permanent fatigue for an extended period of time. It is cumulative. Its origin may be physiological or psychological. Additional symptoms: difficulty concentrating, memory loss (for upcoming events), muscle and joint pain or sleep disorders.

Contributing factors

- Extended service activity.
- Lack of physical conditions.
- Consecutive working days.
- Precarious basic technical training.
- Weather and terrain conditions.
- Cockpit ergonomics (seating, equipment, lights).
- Number of takeoffs and landings.
- Social influences and crew.

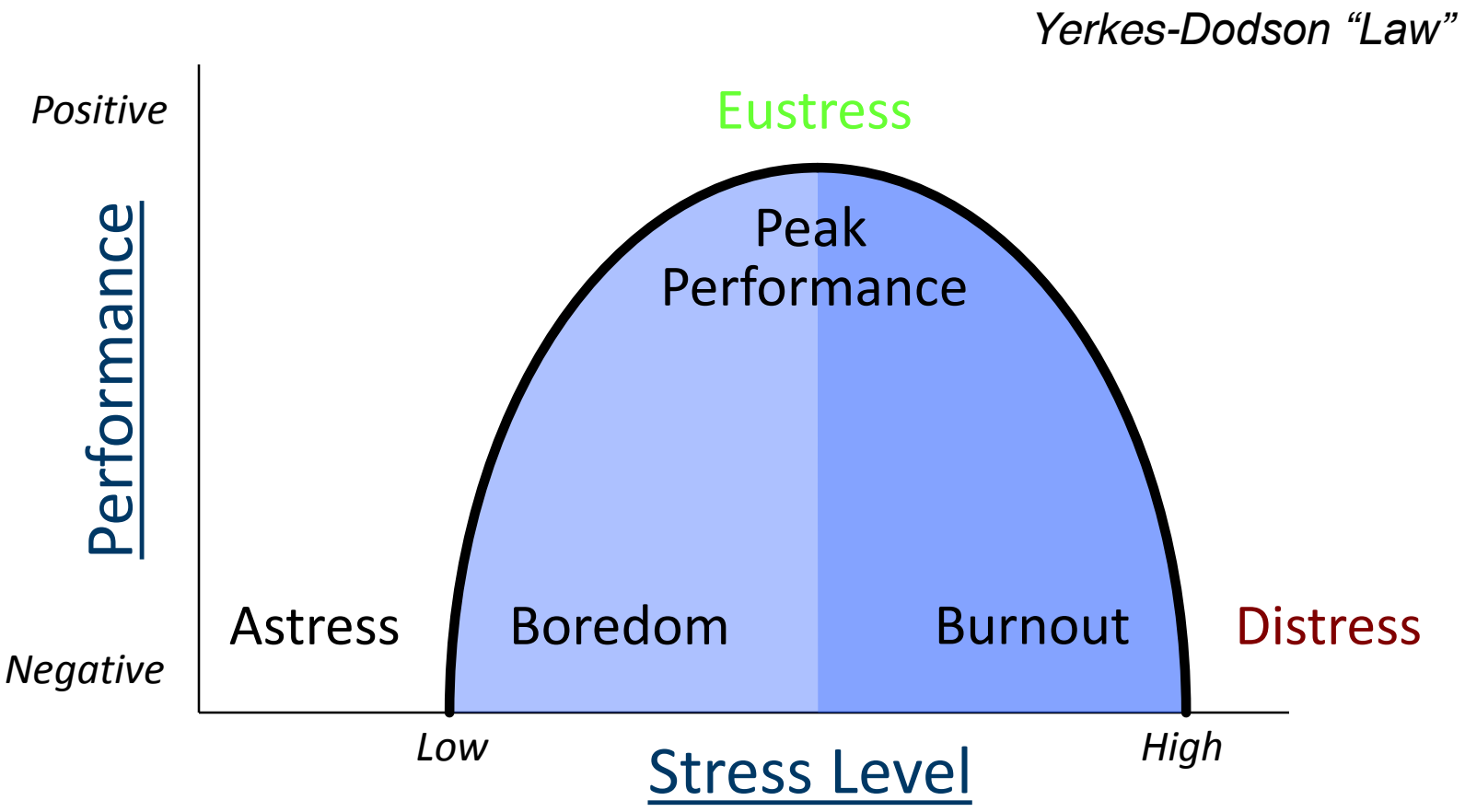
Fatigue: Effects on crews

- Lack of attention.
- Decreases motivation.
- Memory, perception and judgment.
- Abilities.
- Difficulties in decision making.
- Coordination, cooperation and communication.
- Response times.
- Temporal awareness and precision.
- Irritability.

Stress

- Reaction to environmental circumstances fraught with tension of psychic, emotional or physical-traumatic type.
- Set of physiological reactions that prepare the body for action.

Stress and Performances



Types of Stress

- Depending on the length:
  - Acute. It is a temporary and momentary stress. We can be subdivided into two types: Distress (burn out) and Eustress (positive stress).
  - Chronic. It is permanent and cumulative.
- Depending on the circumstances:
  - Everyday stress. Due to adverse circumstances of everyday life of the XXI Century.
  - Environmental stress. Because of the harmful effects of the environment where they work.
  - Professional stress. Specific demands of the job.

Mechanisms against stress

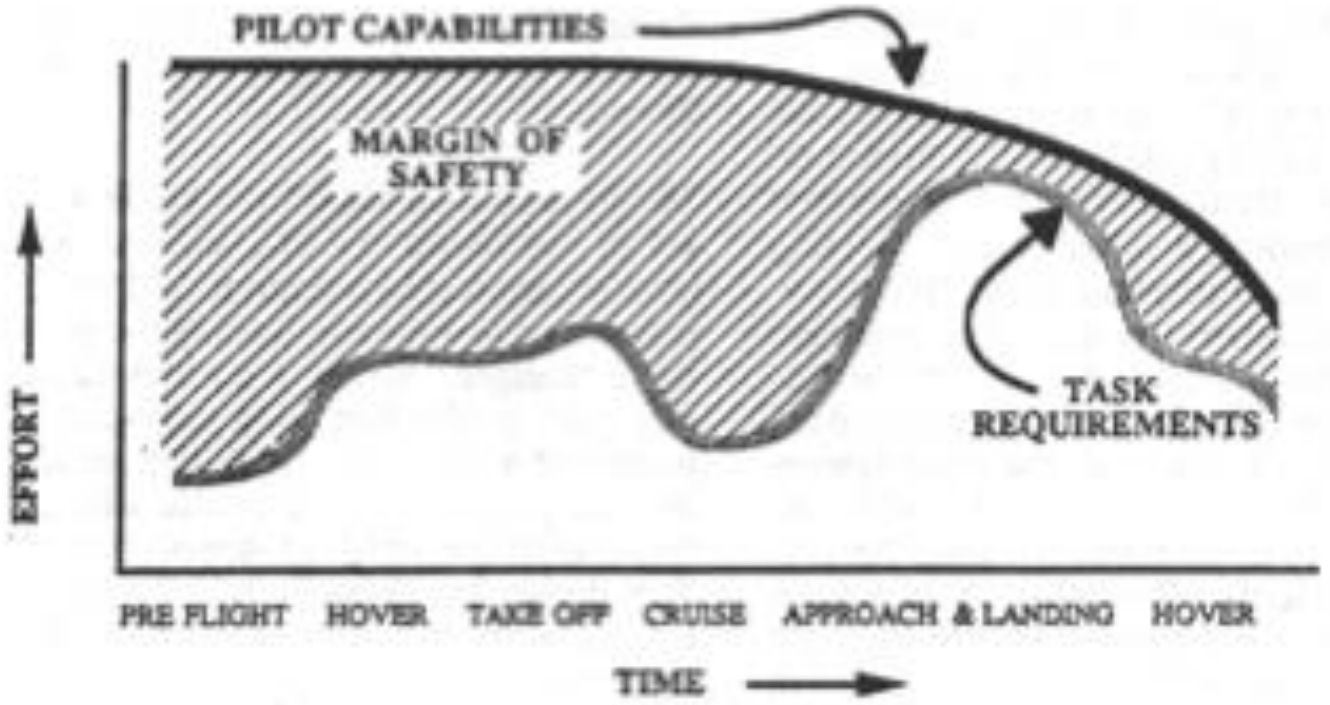
RELAXATION METHODS

UNBURDEN

CHANGE ATTITUDE MENTALITY

AVOIDANCE OF STRESSORS

Safety Margin



SITUATIONAL AWARENESS
DECISION MAKING

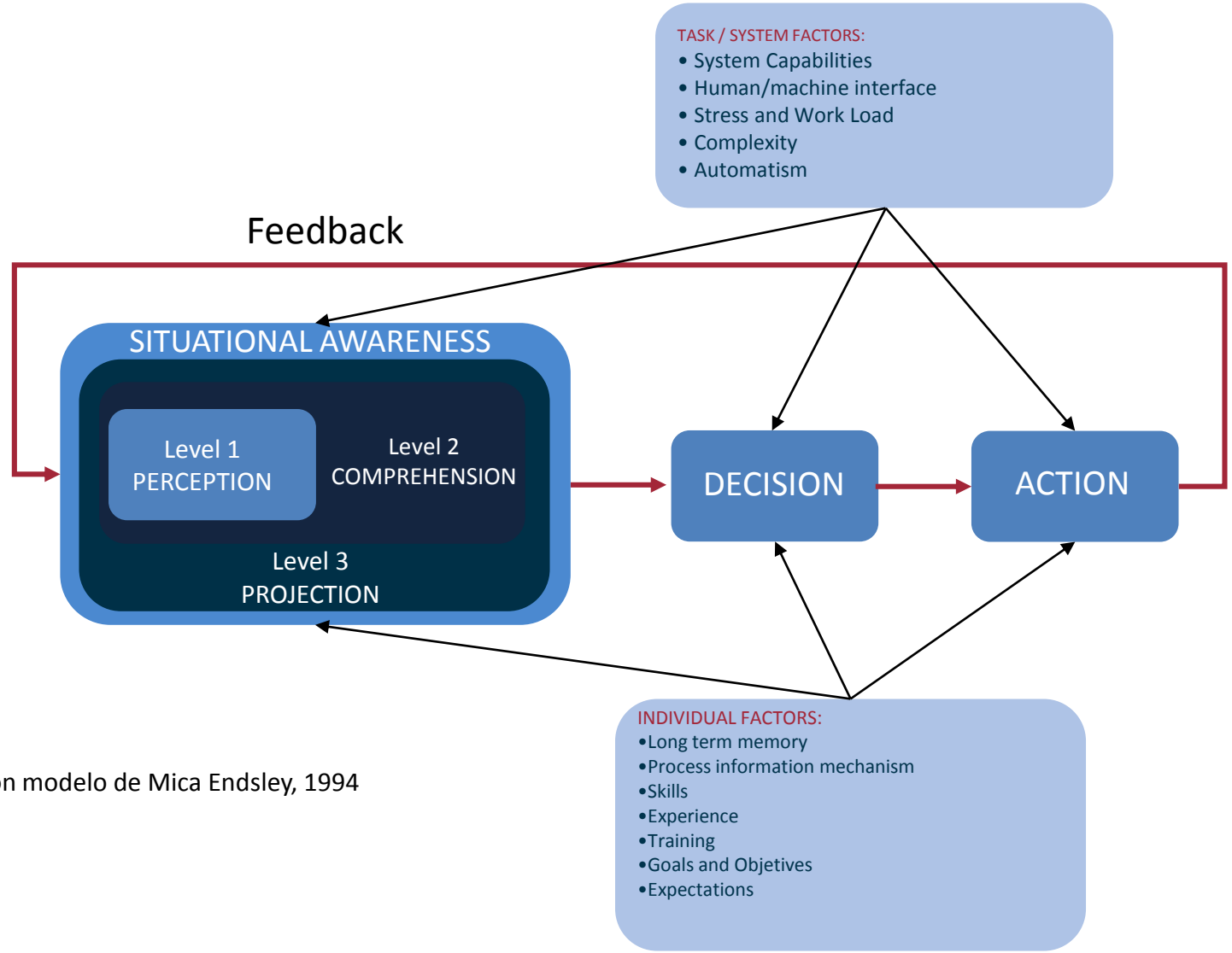
What is SA?

"It is the ability of each individual to perceive information in space and time, the understanding of their meaning and anticipate their evolution in the future ".

Endsley, 1988

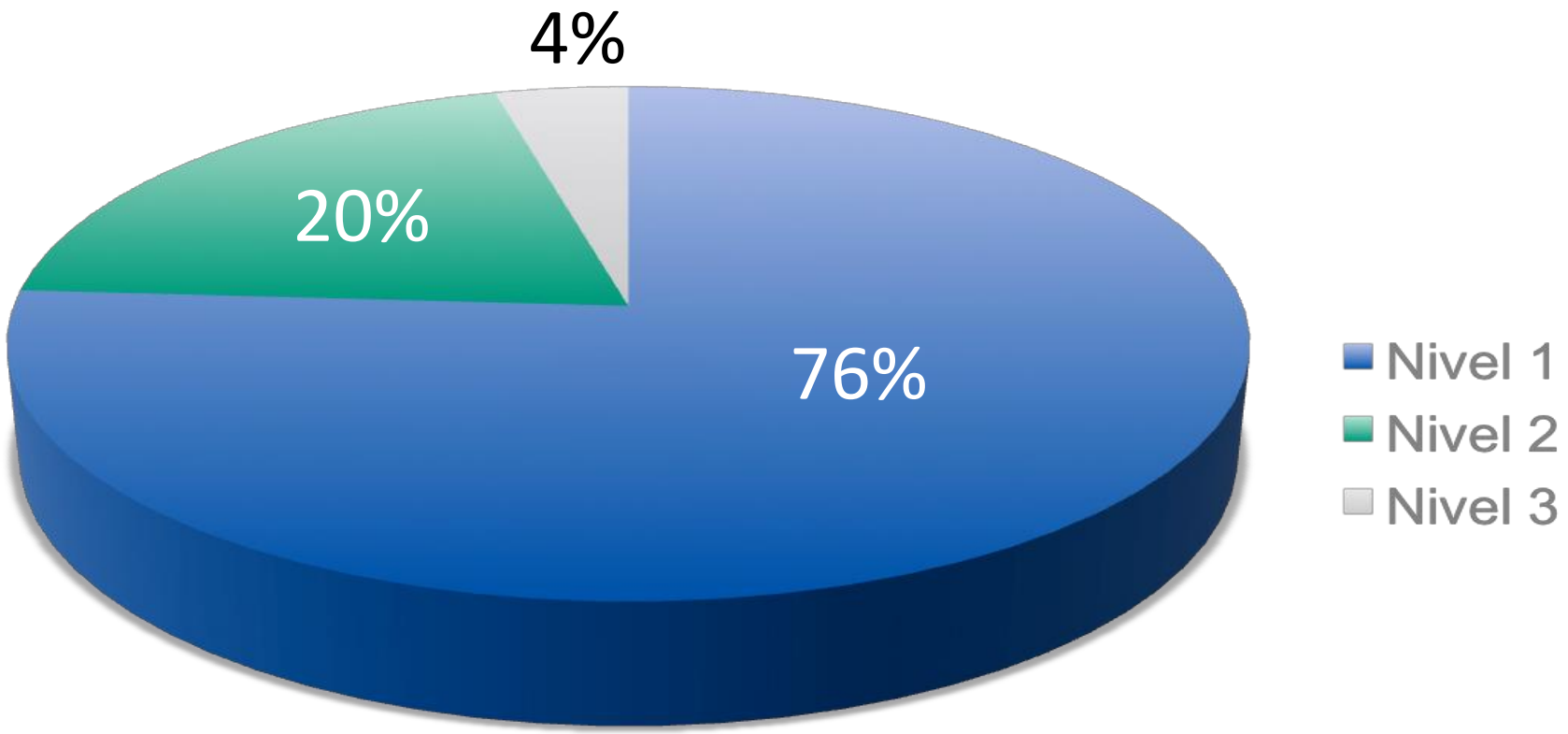
KNOW WHAT'S HAPPENING AROUND ME!!!

SA scheme



Adaptación modelo de Mica Endsley, 1994

Errors in SA



Level 1: PERCEPTION

- Without a correct perception, the possibility of generating a wrong picture of the situation dramatically increase.

- According to Jones and Endley up to 76% of SA errors are due to errors in the perception of information.

Level 2: COMPREHENSION

- It is based on how the pilot and combines, interprets, stores and retains the information perceived.

- There is not only how is perceived or serves the information, but how is integrated and importance thereof is determined.

Level 3: PROJECTION

- Highest level of SA, is the ability to predict future situations, and the ultimate understanding of the situation.

- This ability to anticipate situations (and their consequences) will allow us an "extra" time in our decision making process.

- At this level experts are recognized.

Factors which affects SA

Real World

System capabilities
Interface
Complexity
Automatism

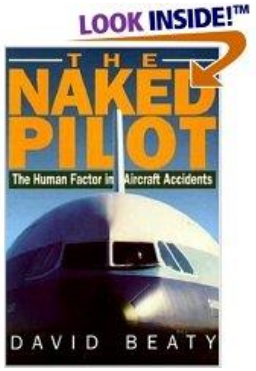
Resources
Knowledges
Skills

Training
Experience

Stress
Workload
Fatigue

Decision Making

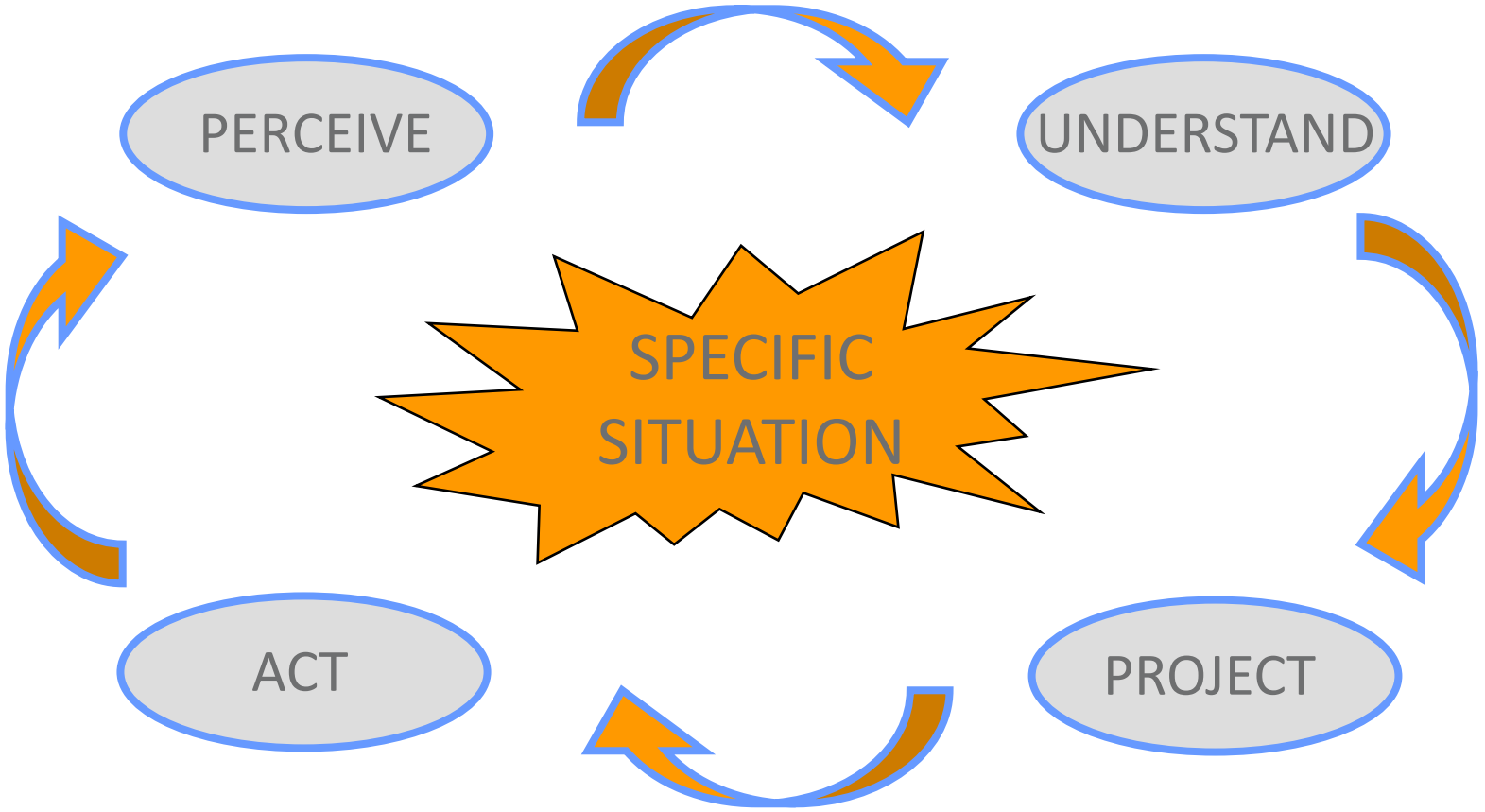
"Once we have made a decision, we experience a sense of relief, but the decision may be wrong and then there is a tendency to defend at all costs, because retract a decision is even more difficult and stressful to take it"



Decision Making

- The CS is the main precursor of the TD.
- Decisions are formed with the CS and CS is formed by decisions.
- We can have good CS and take a wrong decision, the reverse is lucky.

How we make decisions



Can we traing SA and ADM

SOP

YES

CRM

Emergency Porcedures

Technical Skills

Systems

NOTECHS

COMMUNICATION

What is communication?

"It is the transmission of something from one place to another. That "something" may be transmitting a message, a sign, meaning, etc. For there to be communication, both the sender and receiver must share a common code, so that the meaning or information contained in the message can be interpreted without error ".

Penguin Dictionary of Psychology

Communication process

TRANSMITTER

RECEIVER

Code and Message

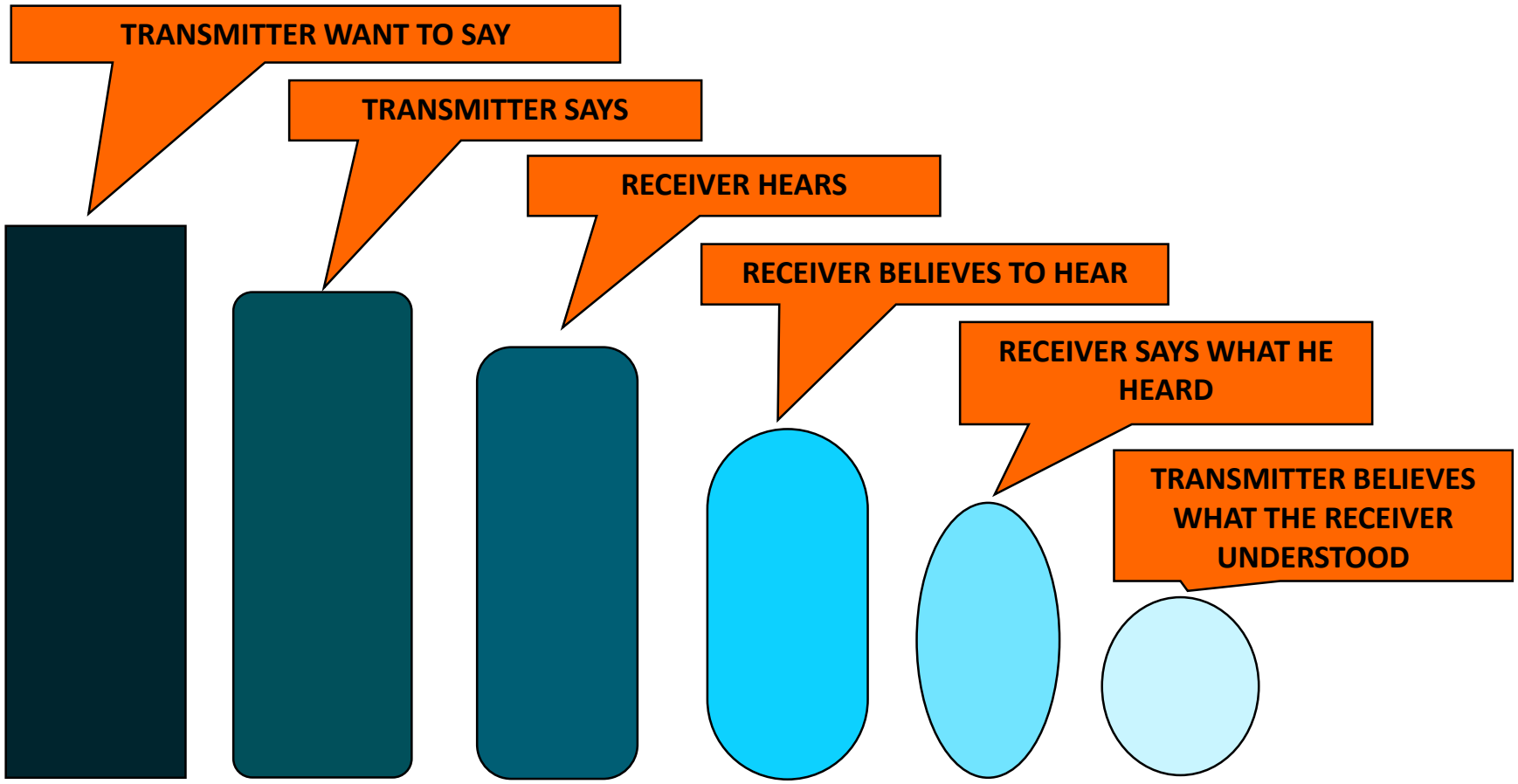
Feedback

CHANNEL

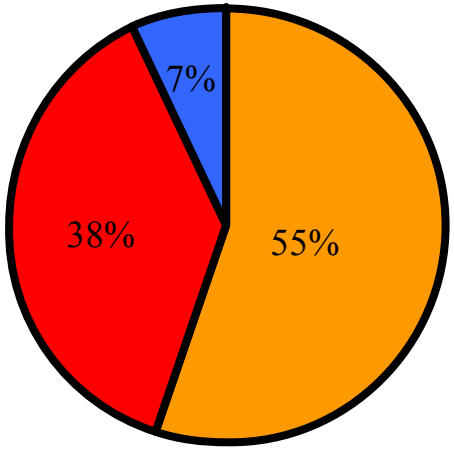
BARRIERS

CHANNEL

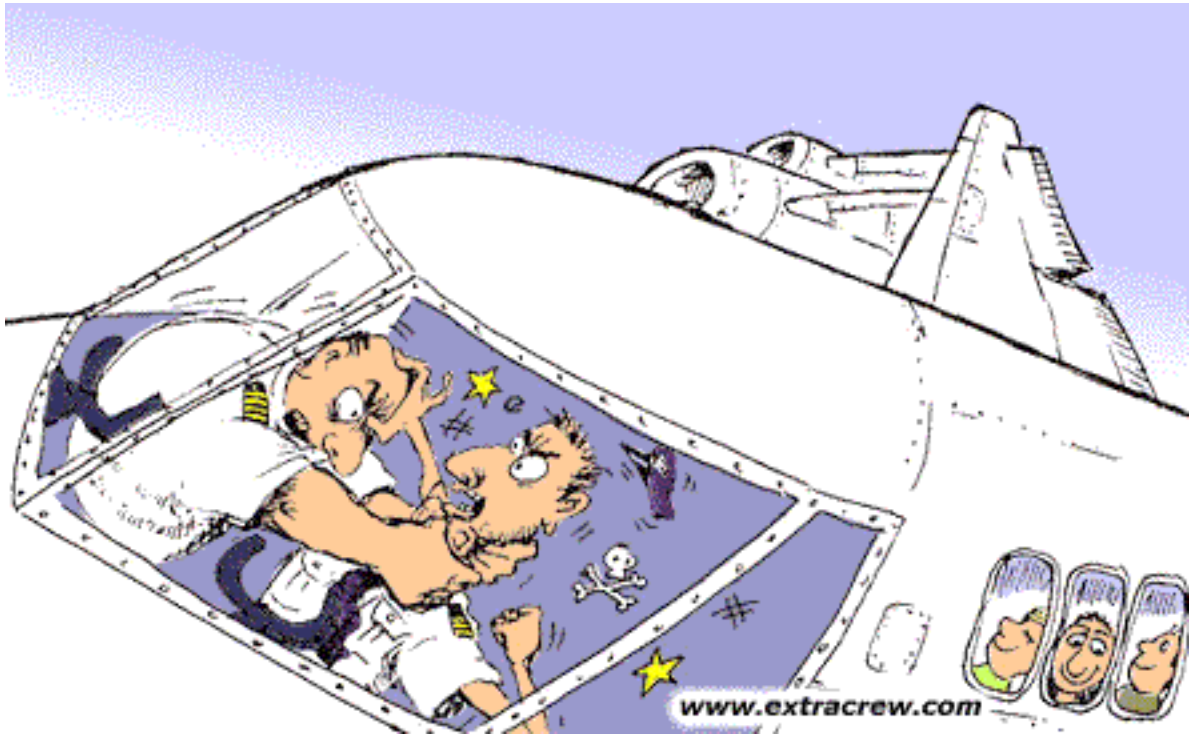
Distorsion


TRANSMITTER WANT TO SAY
TRANSMITTER SAYS
RECEIVER HEARS
RECEIVER BELIEVES TO HEAR
RECEIVER SAYS WHAT HE HEARD
TRANSMITTER BELIEVES WHAT THE RECEIVER UNDERSTOOD

Types of communication



- Body Language
- Tone
- Verbal Language



Attitude

"A good communicator is one who demonstrates a good attitude toward self and others. But this attitude can not be bought. Must be developed through effort and practice until we get it natural"

Flight Safety Foundation Seminar

(Montreal 1984)

Empathy

- Ability to understand the feelings, reasoning and motivations of others.
- Ability to understand that others may have viewpoints different from our own.
- Acting with empathy does not mean agree with each other.
- We can strongly disagree and still be empathetic, accepting and respecting his position as legitimate their own motivations.

Assertiveness

Ability to defend personal rights and expressing thoughts, feelings and beliefs in direct, honest and appropriate way not violate the rights of another person.

5 Tricks for an effective communication

- Speak slowly.
- Active listening (do nothing, just listen).
- If you have questions, please just ask.
- Listen before speaking.
- Try to know what are your expectations.

Tzvetomir Blajev. EUROCONTROL Safety Improvement Initiatives

WFP

wfp.org

World Food Programme

GRACIAS

Capt. David Abad

davidabad@mac.com

WFP

World Food Programme

wfp.org

SMS Training

WFP – Safety Workshop

4th- 5th of February, Kathmandu, Nepal

Objectives

- Understand the SMS concept.
- Practial approach to SMS.
- Works?

Agenda

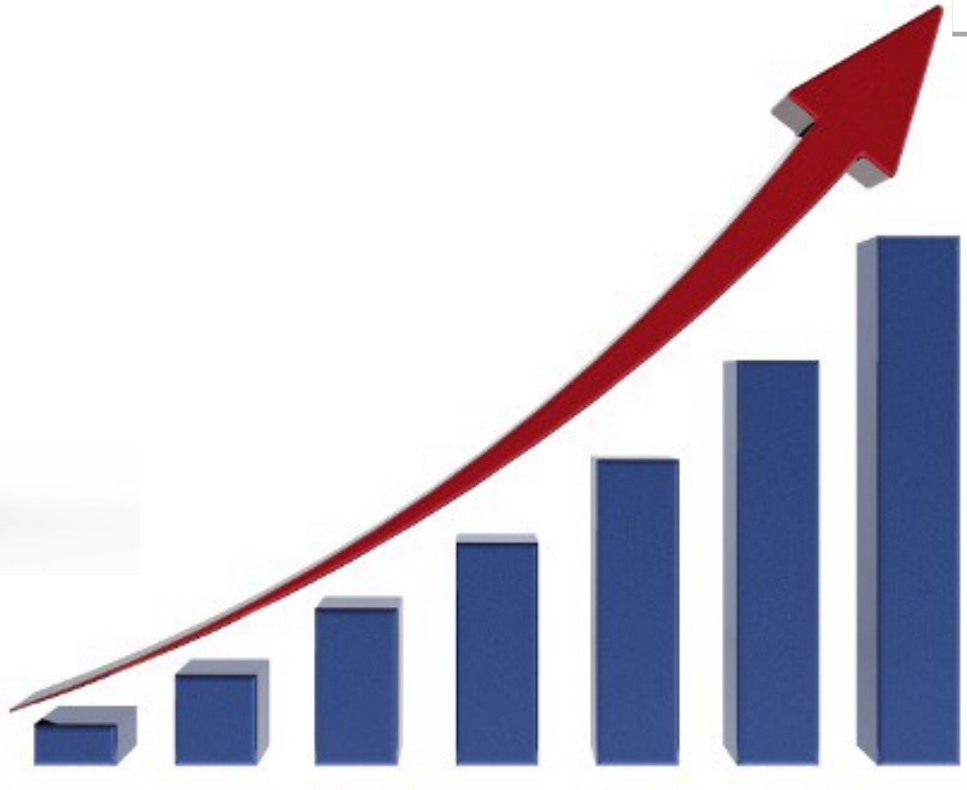
- Why we need a SMS?
- Safety management introduction.
- Building up a SMS:
  - Components.
  - SMM.
  - Hazard identification.
  - Risk Management.
  - Pilot role in SMS.
- Conclusions.

Why Safety Management

- To meet production targets, the management of any aviation organization requires the management of different processes.
- The safety management is one of these processes.
- The safety management is as essential as it is the financial management function, the function of human resources, etc.
- This creates a management dilemma.

What is the aim of …?

Really??



Safety concept

- What is Safety?:
  - Cero accidents (or serious incidents)?
  - Total absence of hazards or risks?
  - Avoiding Mistakes?
  - Compliance with regulations?
  - … ?

Safety concept

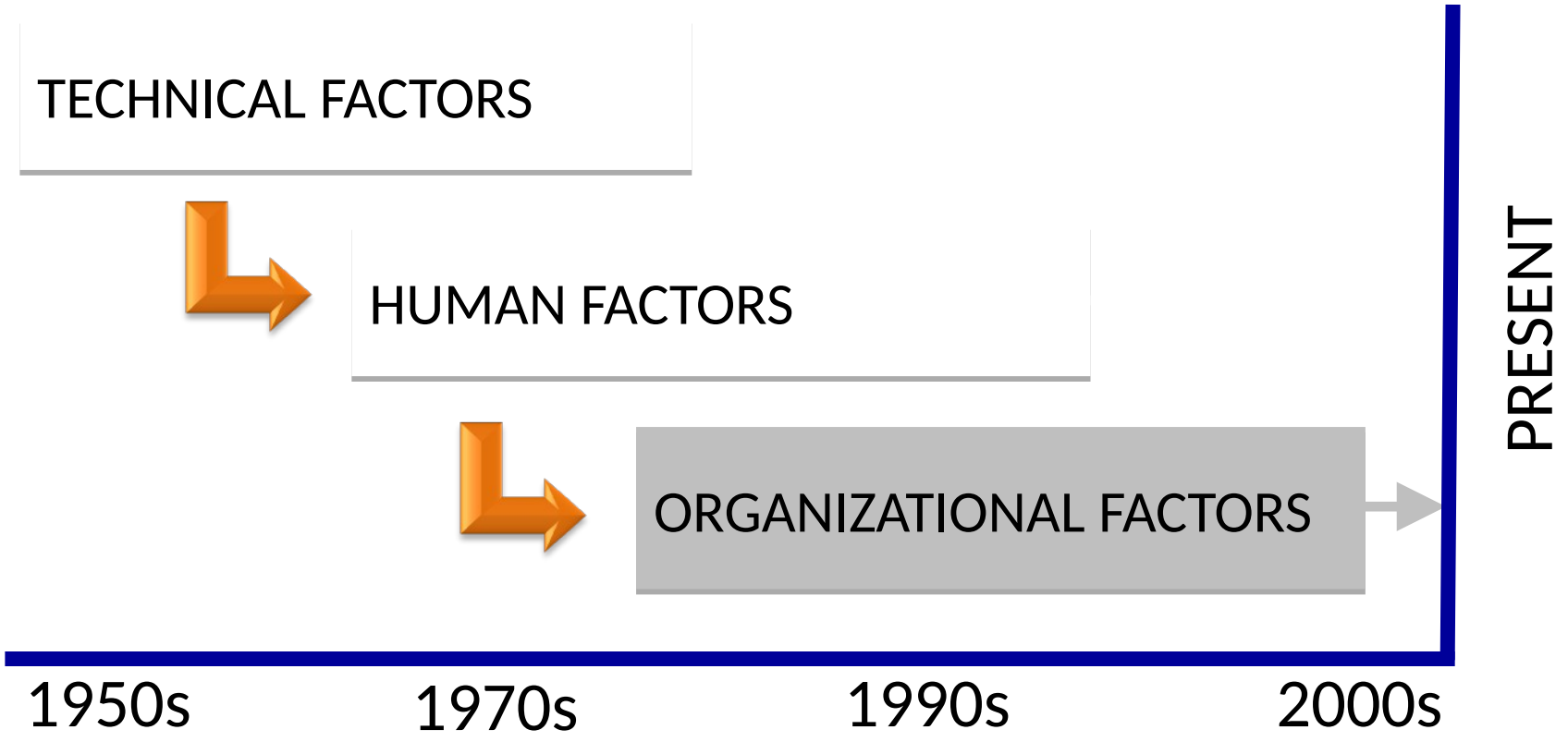
- The elimination of all events, accidents (and serious incidents) is impossible.
- The failures continue to occur despite the best efforts of prevention.
- No human activity or system designed by man that is totally free from risks and errors.
- The risks and errors are acceptable in a safe implicitly system, provided they are *under control*.
- Adherence to procedures manuals.
- Continuous assessment.

Safety concept

- Something is missing in training.
- Experience is not always the answer.
- Aviation is more mental than physical.
- HF helps to recognize the events leading to the error (and accident) and to avoid, mitigate or eliminate errors.
- This is only effective if the whole system is coordinated.

SMS

Safety evolving approach

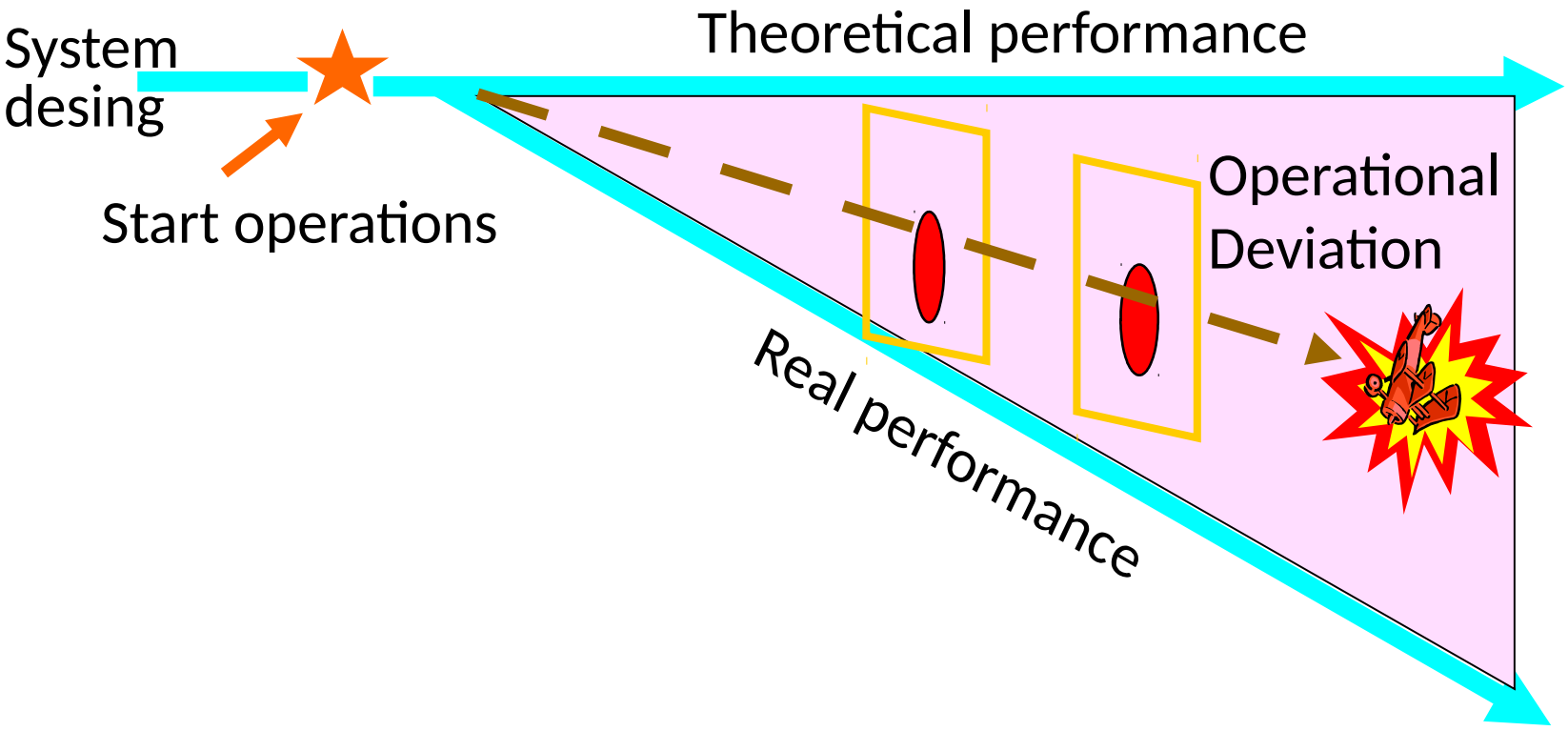


Source: James Reason

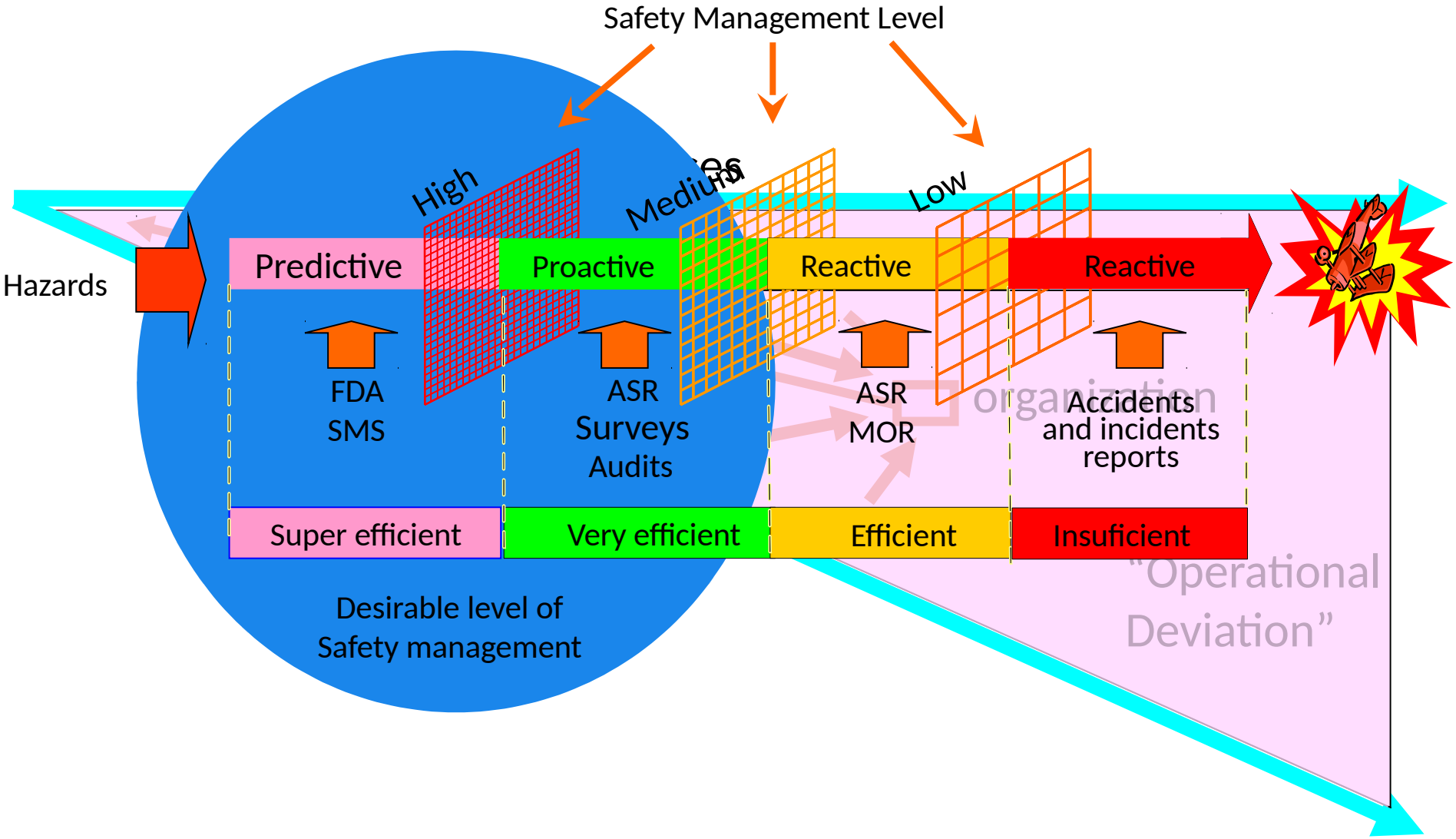
Safety concept (Doc. 9859)

Safety is the state in which the risk of injury to persons or damage to property is reduced and maintained at an acceptable level, or below it, through a continuous process of hazard identification and risk management.

What happens in real life...

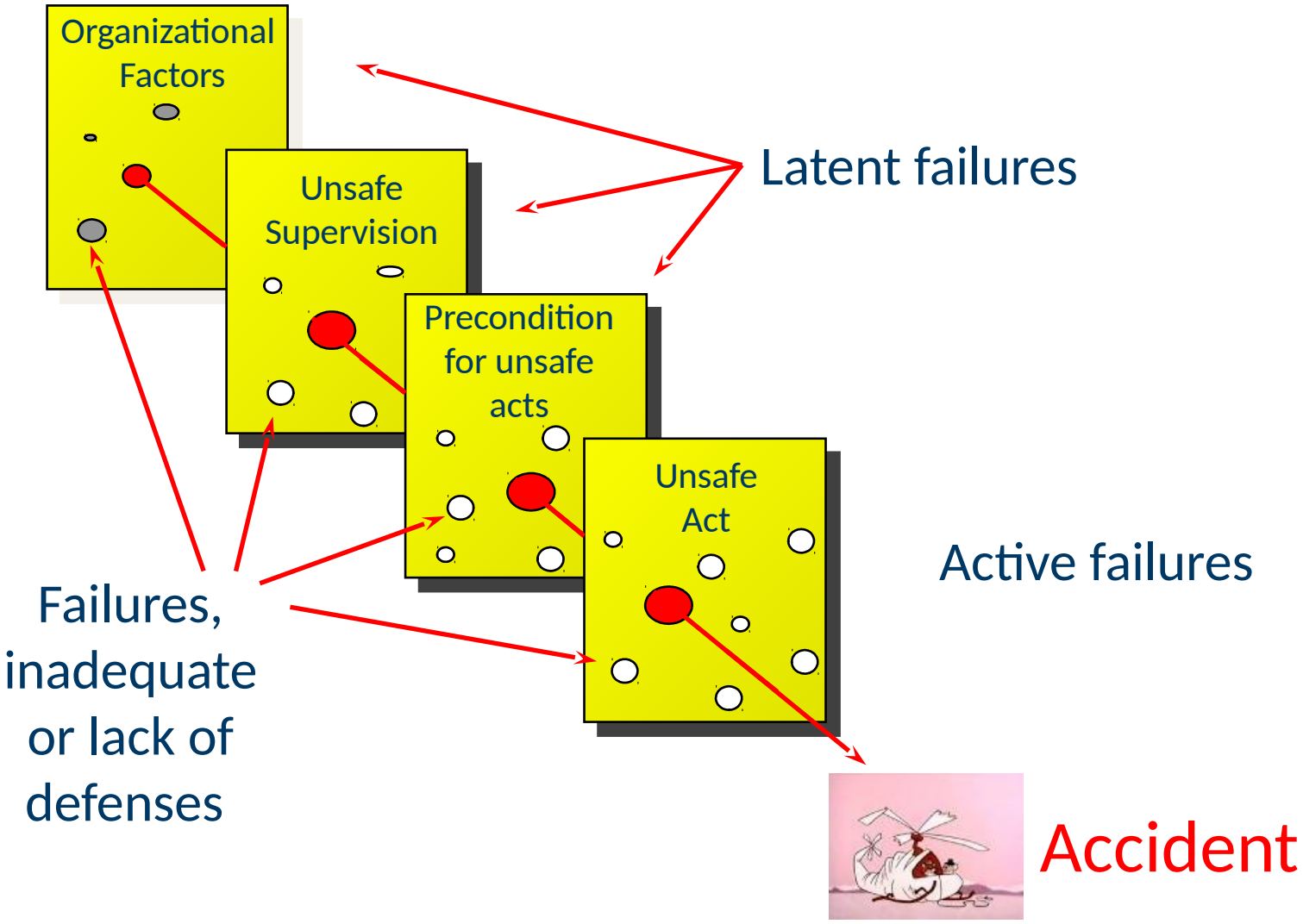


Strategies


Safety Management Level
High
Medium
Low
Hazards
Predictive
Proactive
Reactive
Reactive
FDA
SMS
ASR
Surveys
Audits
ASR
MOR
Accidents
and incidents
reports
Super efficient
Very efficient
Efficient
Insuficient
Desirable level of
Safety management
organization
"Operational
Deviation"

Humans and Operational Safety

Reason Model



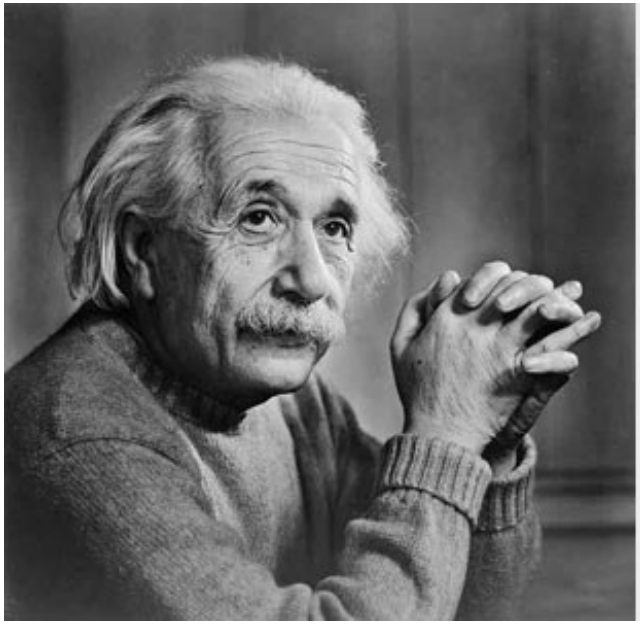
Latent Failures

- …may lie dormant for a long time, and only become evident when they combine with a triggering mechanism to breach the system's defenses

Active Failures

- Those errors and violations having an immediate adverse effect

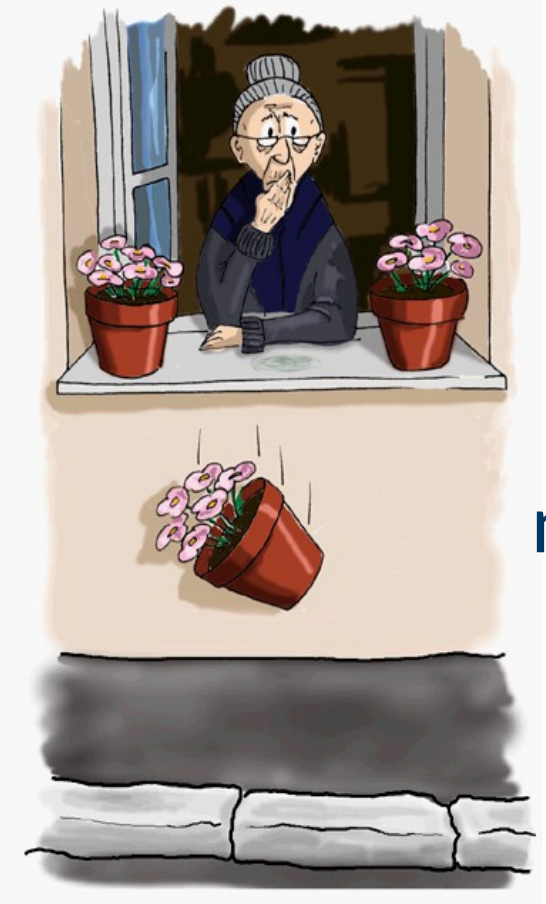
It is fundamental to *learn to manage* the error correctly, *detecting* it, *diminishing* his incidence and *mitigating* its consequences



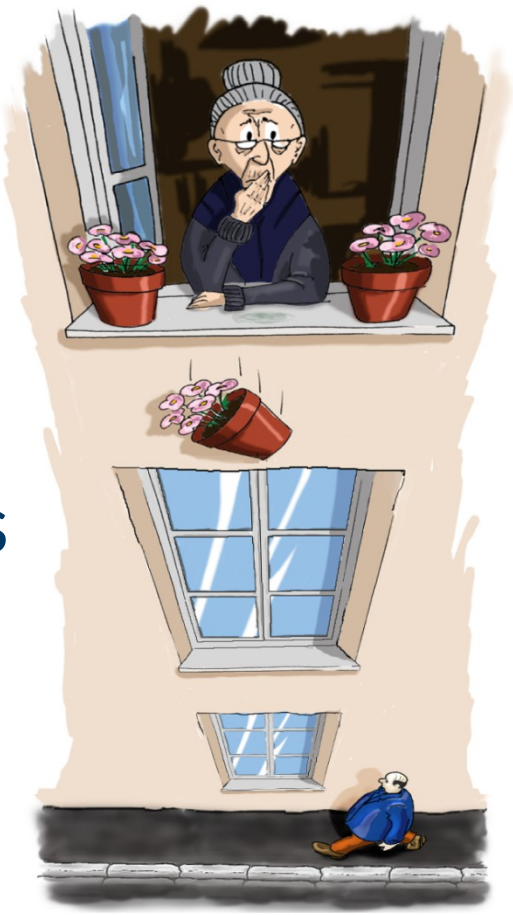
The definition of insanity is repeating the same behaviors and expecting a different outcome.

Albert Einstein

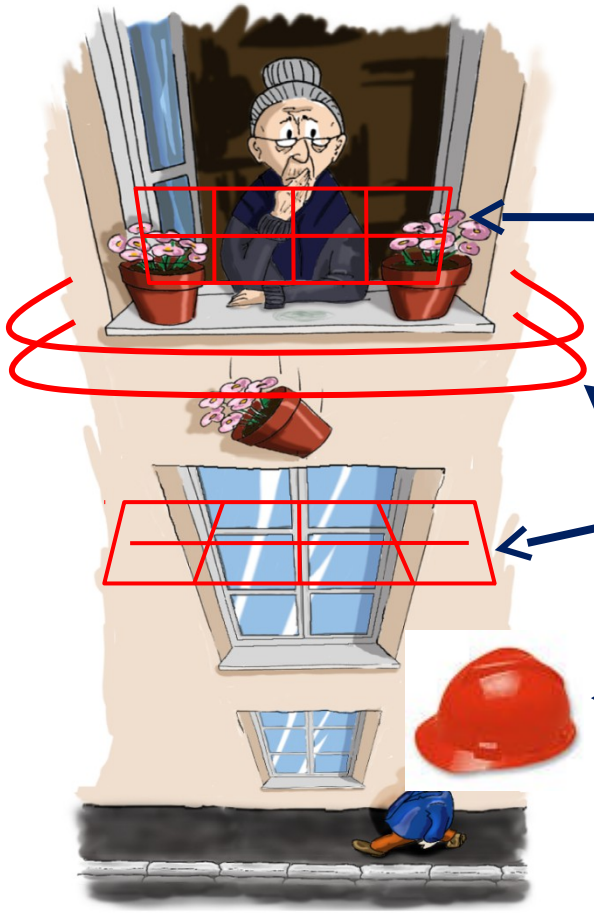
Errors and its consecuences



Causes and consecuences of operational mistakes are not **lineal** in its magnitude



Errors and its consecuences



Prevention:
- Training
- Technology
- Procedures

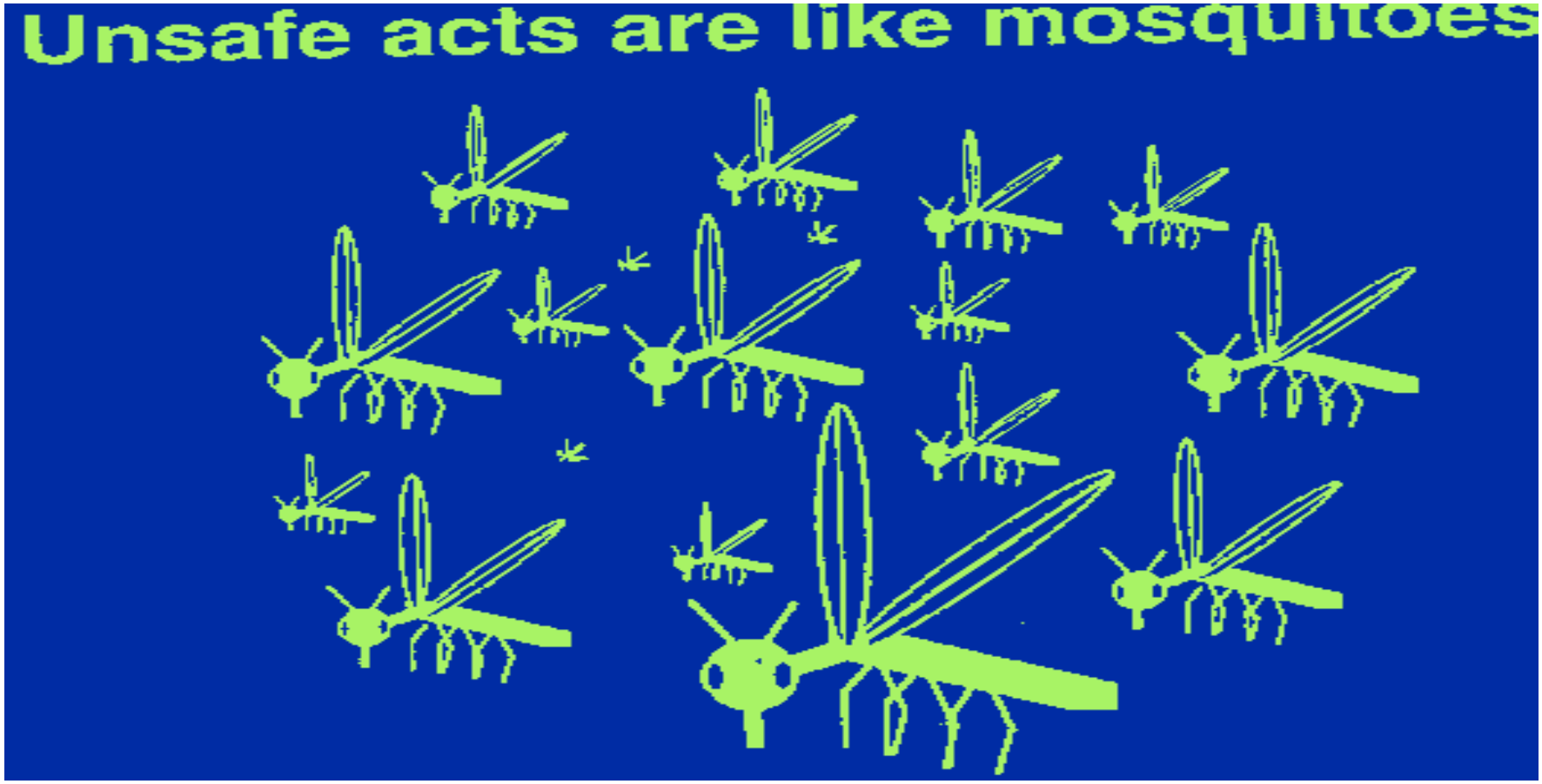
Control

Recuperation

Protection from consecuences

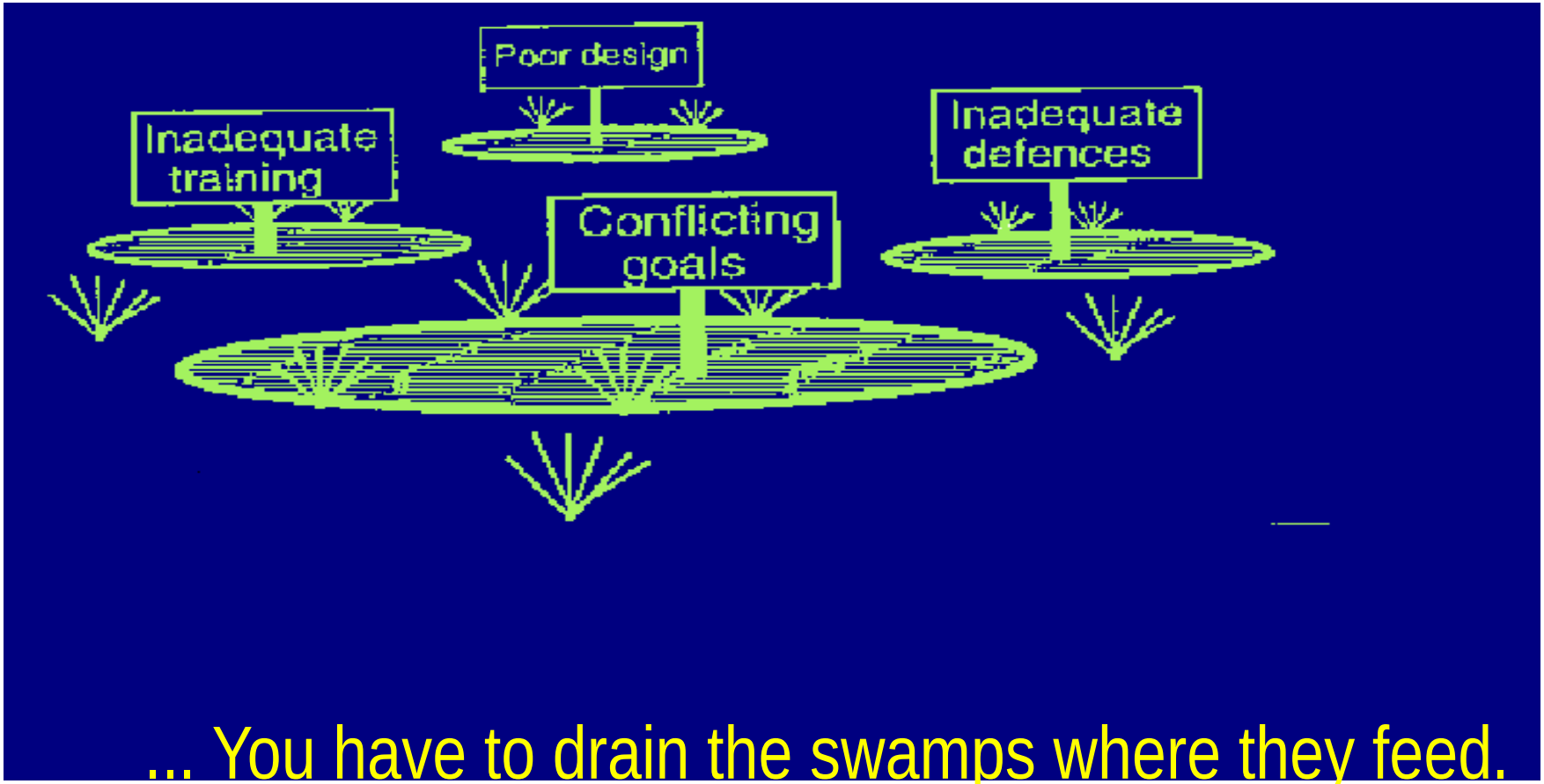
Reduction of consecuences

Errors are…



… like mosquitoes…

To defeat them…



Errors

Number of events:

1 – 5

30 – 100

100 – 1000

1000 – 4000

BULDING UP A SMS

“New rules”

5.4.2012 ES Diario Oficial de la Unión Europea L 100/1

II

(Actos no legislativos)

REGLAMENTOS

REGLAMENTO (UE) Nº 290/2012 DE LA COMISIÓN

de 30 de marzo de 2012

que modifica el Reglamento (UE) nº 1178/2011, por el que se establecen requisitos técnicos y procedimientos administrativos relacionados con el personal de vuelo de la aviación civil en virtud del Reglamento (CE) nº 216/2008 del Parlamento Europeo y del Consejo

Diario Oficial de la Unión Europea

L 311

Edición en lengua española

Legislación

54º año

25 de noviembre de 2011

Sumario

II Actos no legislativos

REGLAMENTOS

★ Reglamento (UE) nº 1178/2011 de la Comisión, de 3 de noviembre de 2011, por el que se establecen requisitos técnicos y procedimientos administrativos relacionados con el personal de vuelo de la aviación civil en virtud del Reglamento (CE) nº 216/2008 del Parlamento Europeo y del Consejo ... 1

Precio: 8 EUR

ES

Safety Management System...

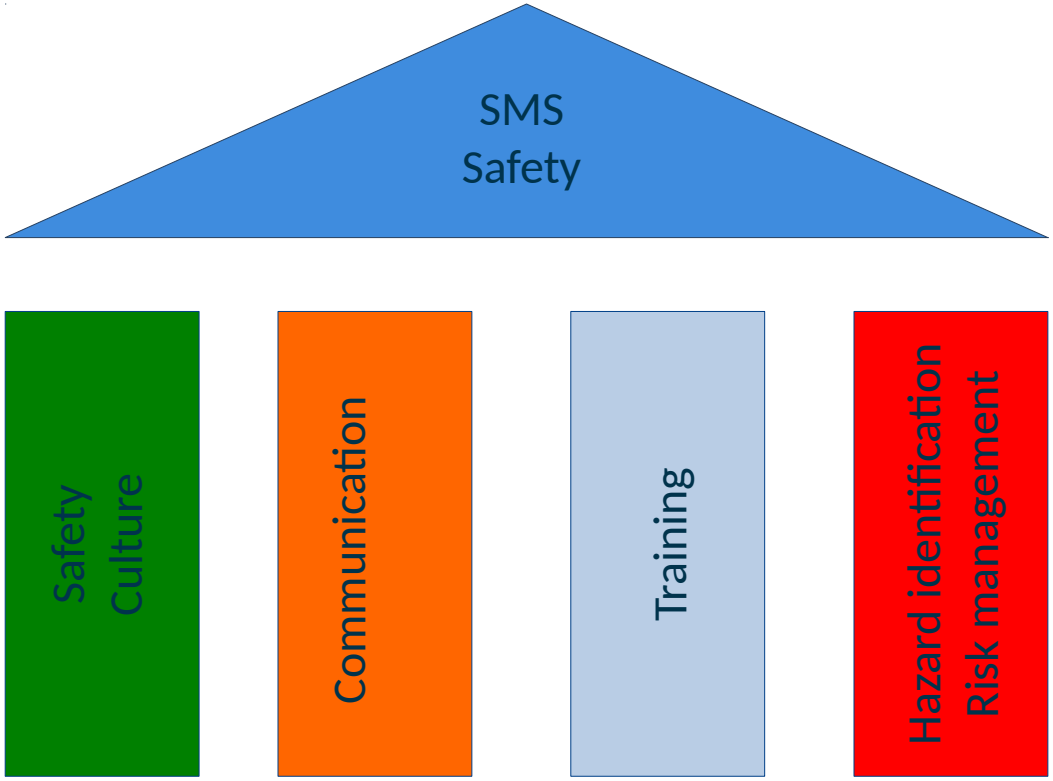
SMS Key Factors - Applicabilty

- SMS is systematic and continuous Management process based on proactive identification of Hazards, and analysis of their Risk.
- SMS is about managing the manageable.
- SMS requires extensive knowledge of Human Error Mechanisms (>85% of errors are Human Error related)
- SMS requires knowledge of… how, what, and why errors occur

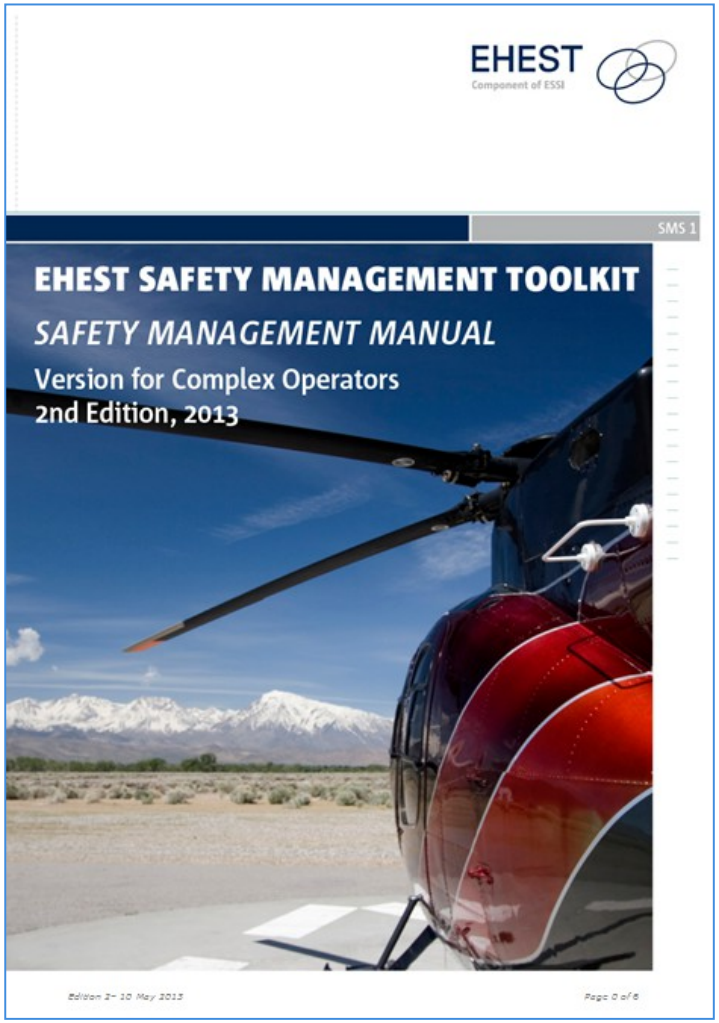
The HOW?

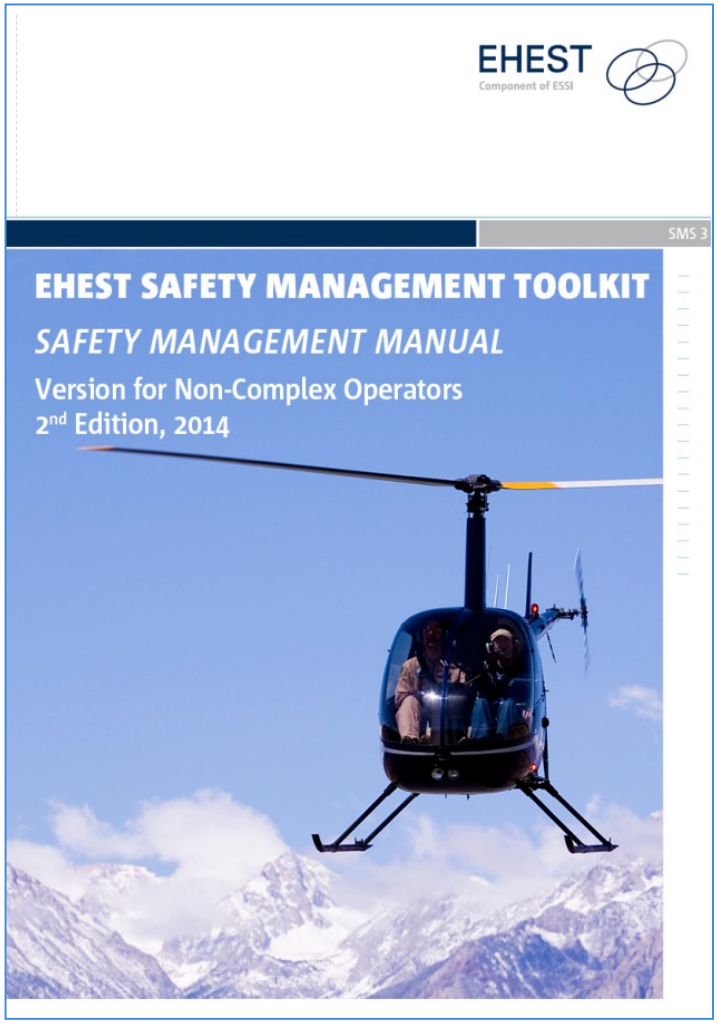
- How to transition from the old to the new view of Safety?
- By developing *effective strategies* to reduce Human Error presence in our daily activities.
- We have to change…

Basic Pillars of a SMS



SMS - SMM


EHEST
Component of ESSI
SMS 1
EHEST SAFETY MANAGEMENT TOOLKIT
SAFETY MANAGEMENT MANUAL
Version for Complex Operators
2nd Edition, 2013


EHEST
Component of ESSI
SMS 2
EHEST SAFETY MANAGEMENT TOOLKIT
SAFETY MANAGEMENT MANUAL
Version for Non-Complex Operators
2nd Edition, 2014

Basic Components of a SMS – SMM

- Safety Policy and objectives.
- Responsibilities.
- Document management.
- Hazard identification and risk management.
- Safety supervision.
- Report and safety investigation system.
- ERP.
- Changes management.
- Safety promotion.

Three Cultures

Safety Culture, Policy and Objetives

- CEO.
- Compromised.
- Comply with rules.
- Resources.
- Responsibilities.
- Occurrences report system.
- Just Culture.
- Communicate.

Organizational Culture

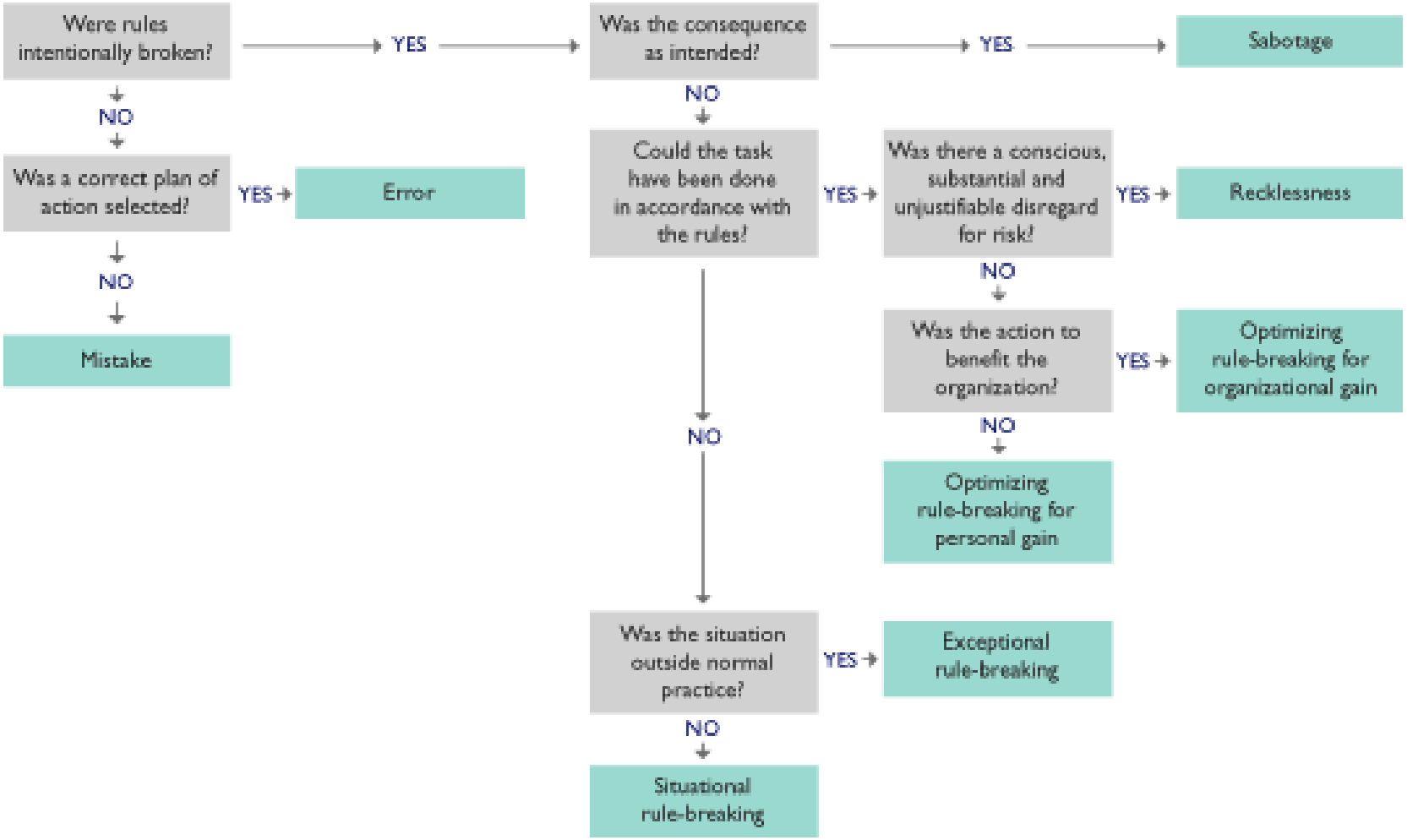
- Establishes guidelines for acceptable bahavior in the workplace, setting up rules and limits.

  "Is the way we do and talk about the things we do here..."

- Organizational Culture establishes:
  - Procedures.
  - Reporting practices.
  - How the information and reporter are treated...

- And more in complex environments!!!

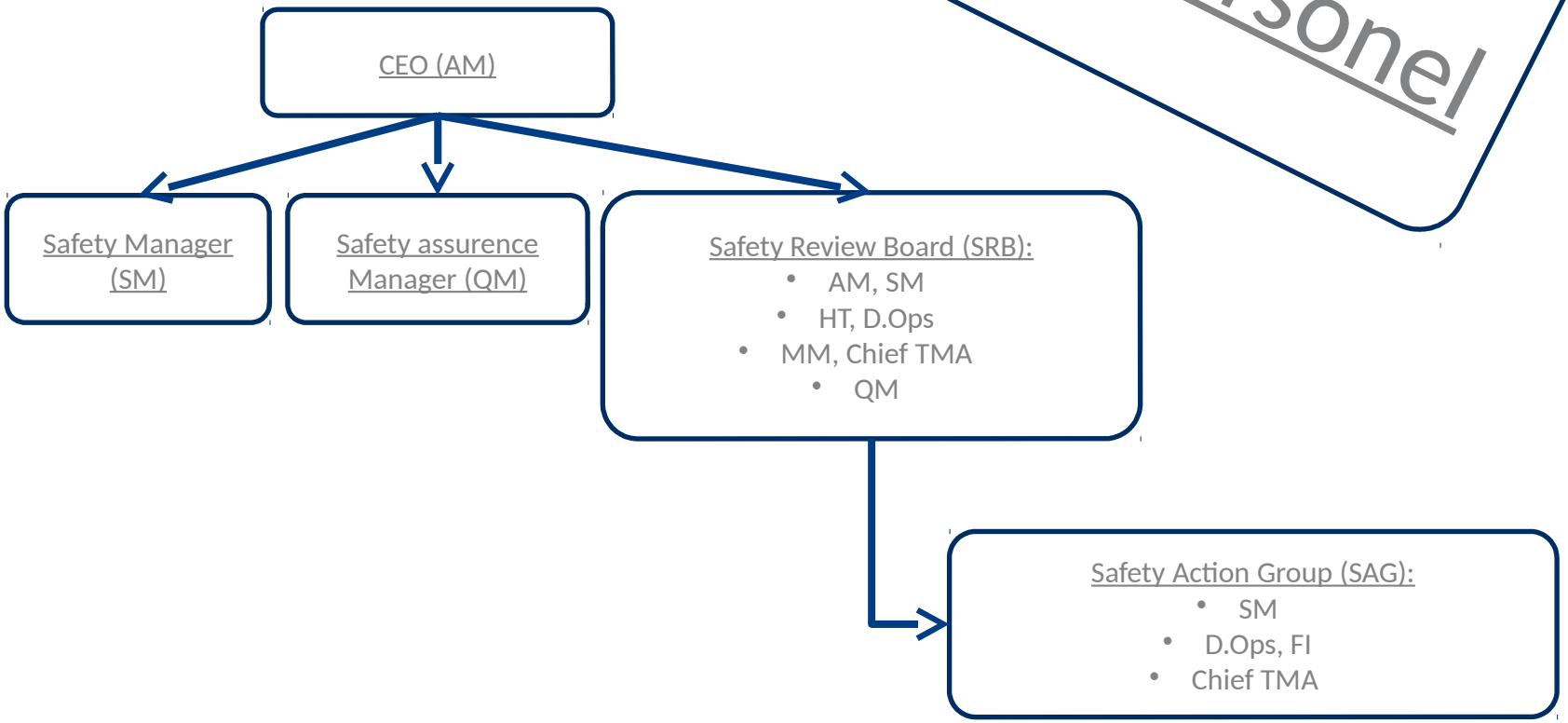
Just Culture



Responsabilities

- Accountable manager
- Safety manager….

All Personel



Documentation management

- Revisions, changes, control, custody…
- All process MUST BE DOCUMENTED!

Collecting safety data - key to efficient management systems safety aspect (SMS)

Cmte. Daniel Mauriño

FFHH y Seguridad de Vuelo – OACI

Flight Occurrence Report

- Without informations SMS is an empy shell!
- FDR vs Report.
- What I have to report?
- What they do with my report? = Feedback.

No one known the real performance of the operation better that the operative personnel

Daniel Mauriño

Report policiy

- Confidential.
- NO PUNITIVE (Annex 13/19 OACI).
- Error is assumed and accepted.
- Do not threat.
- “0” Tolerance with unsafe acts, violations or unacceptable behaviors.

5 Report Characteristics

- People are willing to notify.
- Feel the responsibility to notify.
- Know about the importance of the information, HF, SMS.
- Flexibility.
- Learning tool.

Safety assurance

- Monitor and measurement of our safety performances = Data, indicators…
- Change Management.
- Continuous improvement.

Safety promotion

- Training and education.

- Safety communications:
  - Briefings.
  - Leaflets.
  - SB…

Safety Tools Set

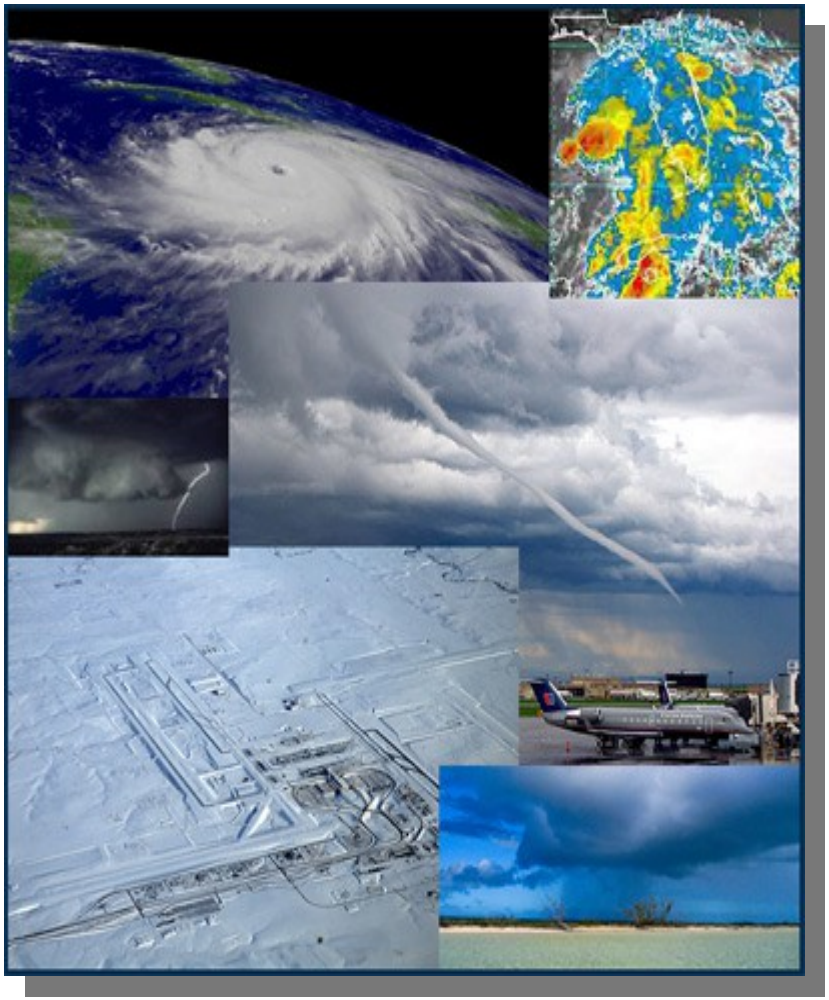
- Safety Management Manual.
- Emergency Response Plan.
- Hazard Identification Tool.
- SMS Safety Database.
- Undesirable Events Database.
- Risk Assessment.
- Follow Up.

Excel Based tools

Hazard identification and Risk management

Hazard

A condition, object, activity or event with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of the ability to perform a prescribed function.



Types of Hazards

- Natural.
- Technical.
- Economics.

Hazard identification

- Desing.
- SOP and operational factors.
- Communications.
- Organizational factors.
- Working conditions.
- Rule
- Defenses
- Human performances.

Understand the hazards

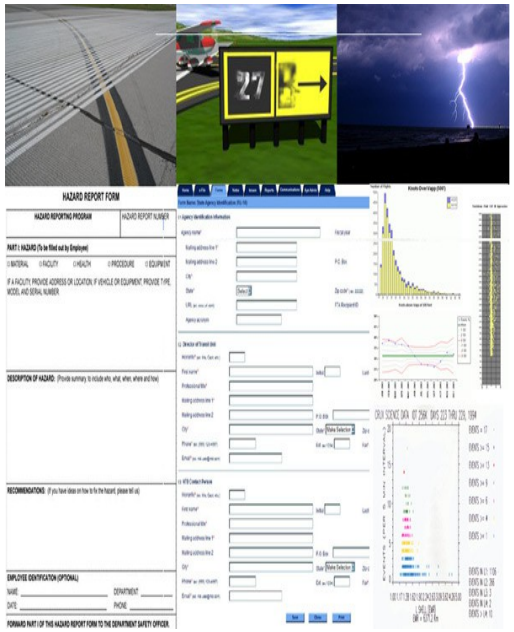
- There is a natural tendency to describe hazards as one of its consequences.
  - “Poor aerodrome signaling” vs. “Rwy incursions”.
  - Hides the nature of the hazards.
  - Interfere with identifying other important consequences.

- Correct hazard identification:
  - Allow to establish their sources or mechanisms that generate
  - To assess magnitude of the consequences.

Hazard Identification Sources

- Internal
  - Initial analisys of flight ops
  - FD analisys
  - Voluntary occurence reports
  - Audits and surveys

- External
  - Accidents and incidents DB
  - SNS, NTSB,…
  - Wikipedia



Hazard identification process

- State the generic hazard:
  - Cargo mission
- Identify the specific components of the hazard:
  - Cargo, sling.
  - Environment.
  - …
- Direct course to the specific consequences:
  - Cargo can hit objects.
  - Limited power.
  - …

Identify…

Resumen de nivel de riesgo corregido por maniobras

AM REF	Ejercicio aéreo	Preflight check	Towing	Fuelling	Starting	Taxiing	Take-off	Climb < 500 Ft/ground	Climb > 500 Ft/ground	Level flight	Maneuvering	Descent> 500 Ft/ground	Final approach	Hover OGE	Hover IGE	Landing	Engine shutdown	Post-flight check
AM-03	Comprobaciones	N/A	N/A	N/A	N/A	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Tolerable	N/A	Aceptable	Aceptable	Aceptable	N/A
AM-04	Vuelo de traslación: Virajes, ascensos, descensos	N/A	N/A	N/A	N/A	N/A	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Aceptable	Aceptable	N/A	N/A	N/A	N/A	N/A
AM-05	Cambios de velocidad en vuelo recto y nivelado	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Tolerable	Tolerable	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AM-06	Maniobras en estacionario: desplazamientos, giros, ejercicios de coordinación	N/A	N/A	N/A	N/A	Aceptable	N/A	N/A	N/A	N/A	Tolerable	N/A	N/A	N/A	Tolerable	N/A	N/A	N/A
AM-07	Tomas y despegues en estacionario	N/A	N/A	N/A	N/A	N/A	Tolerable	N/A	N/A	N/A	Aceptable	N/A	N/A	N/A	Tolerable	Tolerable	N/A	N/A
AM-08	Circuitos de tráficos	N/A	N/A	N/A	N/A	N/A	Tolerable	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Tolerable	N/A	Tolerable	Tolerable	N/A	N/A
AM-09	Aproximaciones: normal, tendida y profunda	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Tolerable	Tolerable	N/A	N/A	Tolerable	N/A	N/A
AM-10	Despegues	N/A	N/A	N/A	N/A	N/A	Tolerable	Tolerable	Aceptable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AM-11	Autorrotación básica	N/A	N/A	N/A	N/A	Tolerable	Inaceptable	Inaceptable	Inaceptable	Tolerable	Tolerable	Tolerable	Tolerable	Inaceptable	Tolerable	Inaceptable	N/A	N/A
AM-12	Maniobras en autorrotación: con virajes de 90/180/360, desde estacionario, a baja velocidad y alta velocidad	N/A	N/A	N/A	N/A	Tolerable	Inaceptable	Inaceptable	Inaceptable	Tolerable	Tolerable	Tolerable	Tolerable	Inaceptable	Tolerable	Inaceptable	N/A	N/A
AM-13	Emergencias: pasivas, LTE, anillos (VRS), vuelco dinámico y estático, fallos de R/C, governor, LOW-G	N/A	N/A	N/A	N/A	Tolerable	Tolerable	Aceptable	Aceptable	Tolerable	Tolerable	Aceptable	Tolerable	Tolerable	Tolerable	Aceptable	N/A	N/A
AM-14	Vuelo SOLO	Aceptable	N/A	N/A	Aceptable	Aceptable	Tolerable	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Tolerable	Inaceptable	Tolerable	Tolerable	Aceptable	Aceptable
AM-15	Maniobras avanzadas: Laderas, Frenados rápidos, HOGE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Tolerable	N/A	N/A	Tolerable	Tolerable	Tolerable	N/A	N/A
AM-16	Tomas fuera de aeropuertos, áreas confinadas	N/A	N/A	N/A	N/A	Tolerable	N/A	Tolerable	Aceptable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	N/A	N/A
AM-17	Vuelo en montaña	N/A	N/A	N/A	N/A	N/A	Tolerable	Tolerable	Aceptable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	N/A	N/A
AM-18	Vuelos de navegación	Tolerable	Tolerable	Tolerable	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Tolerable	Tolerable	N/A	Aceptable	Aceptable	Aceptable	Aceptable
AM-19	Vuelo nocturno	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	Tolerable	Aceptable	Aceptable	Tolerable	Tolerable	Tolerable	Inaceptable	Tolerable	Tolerable	Tolerable	Aceptable

Risk

- The evaluation of the consequences of a hazard, expressed in terms of probability and severity, taking as reference the worst foreseeable conditions.
  - A crosswind of 15 knots is a hazard.
  - The possibility that the pilot could not control the aircraft during takeoff or landing, is one of the consequences of the hazard.
  - The evaluation of the consequences of the possibility that the pilot can not control the aircraft expressed in terms of probability and severity is the risk.

Risk Probability

The possibility that an unsafe event or condition might occur:

Safety Risk Probability Table

RISK PROBABILITY	MEANING	VALUE
FREQUENT	**Likely to occur many times** (has already occurred in the company (Freq. > 3 x year). Has occurred frequently in the history of the aviation industry)	5
OCCASIONAL	**Likely to occur sometimes** (has already occurred in the company (Freq. < 3 x year). Has occurred infrequently in the history of the aviation industry)	4
REMOTE	**Unlikely to occur, but possible** (has already occurred in the company at least once. Has regularly occured in the history of the aviation industry)	3
IMPROBABLE	**Very unlikely to occur** (not known to have occurred in the company but has already occurred at least once in the history of the aviation industry)	2
EXTREMELY IMPROBABLE	**Almost inconceivable that the event will occur** (it has never occurred in the history of the aviation industry)	1

Risk Severity

Possibles consecuences of the event or unsafe situation, taking as reference the worst foreseeable conditions.

Safety Risk Severity Table

SEVERITY OF OCCURRENCE	MEANING				VALUE
	PERSONNEL	ENVIRONMENT	MATERIAL	IMAGE	
CATASTROPHIC	Multiple fatalities	Massive effects (pollution, destruction, etc.)	Damage> 1 M€	International impact	E
HAZARDOUS	Fatality	Effects difficult to repair	Damage< 1 M€	National impact	D
MAJOR	Serious injuries	Noteworthy local effects	Damage< 250K€	Considerable impact	C
MINOR	Slight injuries	Little impact	Damage< 50K€	Limited impact	B
NEGLIGIBLE	Superficial or no injuries	Negligible or no effects	Damage < 10K€	Light or no impact	A

Risk assessment Matrix

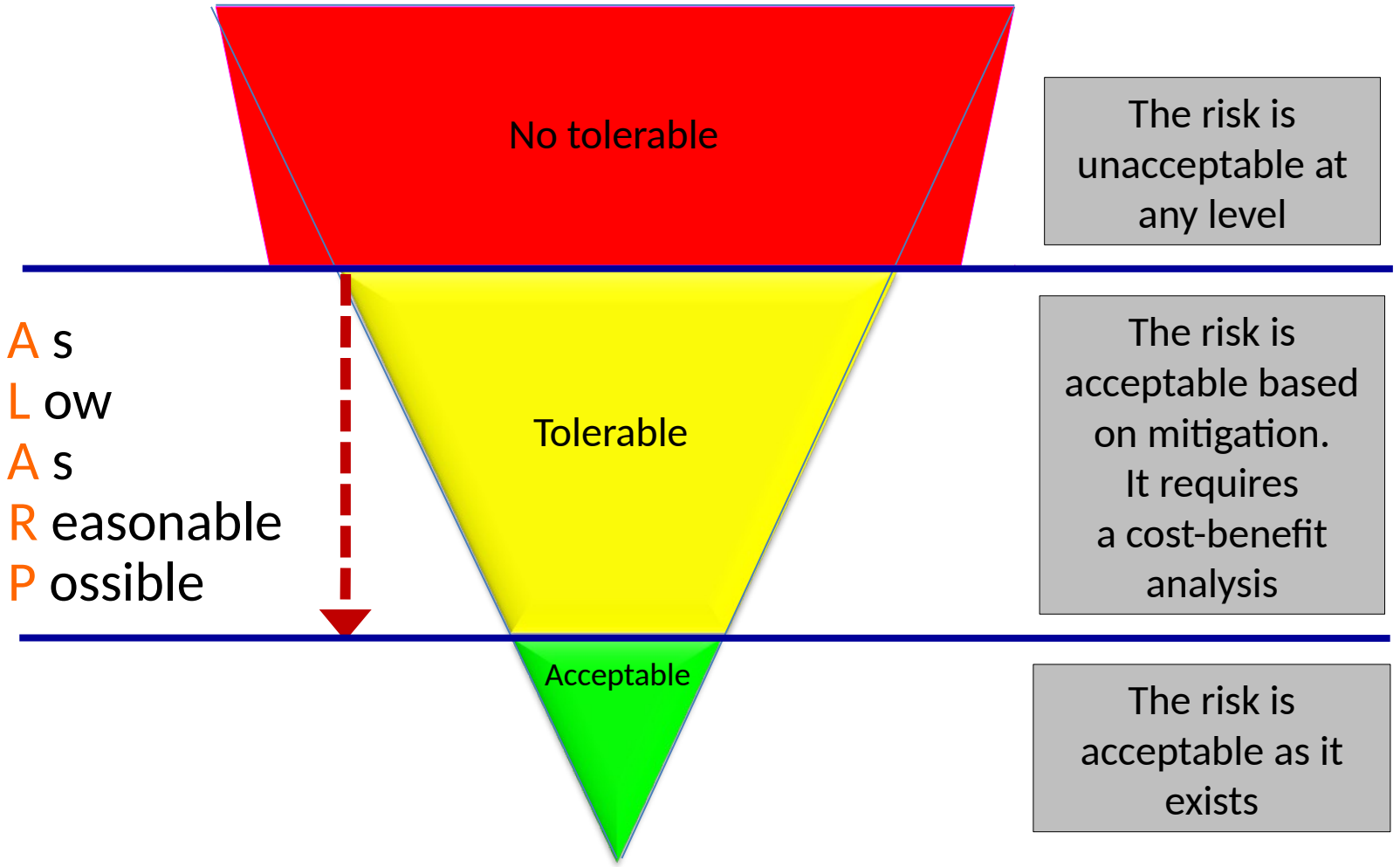
Safety Risk Assessment Matrix

RISK PROBABILITY	RISK SEVERITY				
	NEGLIGIBLE (A)	MINOR (B)	MAJOR (C)	HAZARDOUS (D)	CATASTROPHIC (E)
FREQUENT (5)	5 A	5 B	5 C	5 D	5 E
OCCASIONAL (4)	4 A	4 B	4 C	4 D	4 E
REMOTE (3)	3 A	3 B	3 C	3 D	3 E
IMPROBABLE (2)	2 A	2 B	2 C	2 D	2 E
EXTREMELY IMPROBABLE (1)	1 A	1 B	1 C	1 D	1 E

Risk Management

- What is it?
  - The identification, analysis and elimination and / or mitigation of the risks that threaten the capabilities of an organization to an acceptable level.
- What is the OBJETIVE?
  - Aim for a balanced allocation of resources and implementation of strategies to address all risks and viable control and risk mitigation.
- Why it is important?
  - A key management system security component.
  - Approach to the allocation of resources based on data and therefore defensible and easier to explain.

Risk Management



CBA - Cost Benefit Analysis

		BENEFITS		
		High	Average	Low
COSTS	Low	1	2	3
	Average	2	3	4
	High	3	4	5

Figure 5 – A Simple Costs Benefits Analysis Matrix

Source: D. Huntzinger, Eurocopter

Risk Control / Mitigation Strategies

- Measures to eliminate the potential danger or that reduce the likelihood or severity of risk.

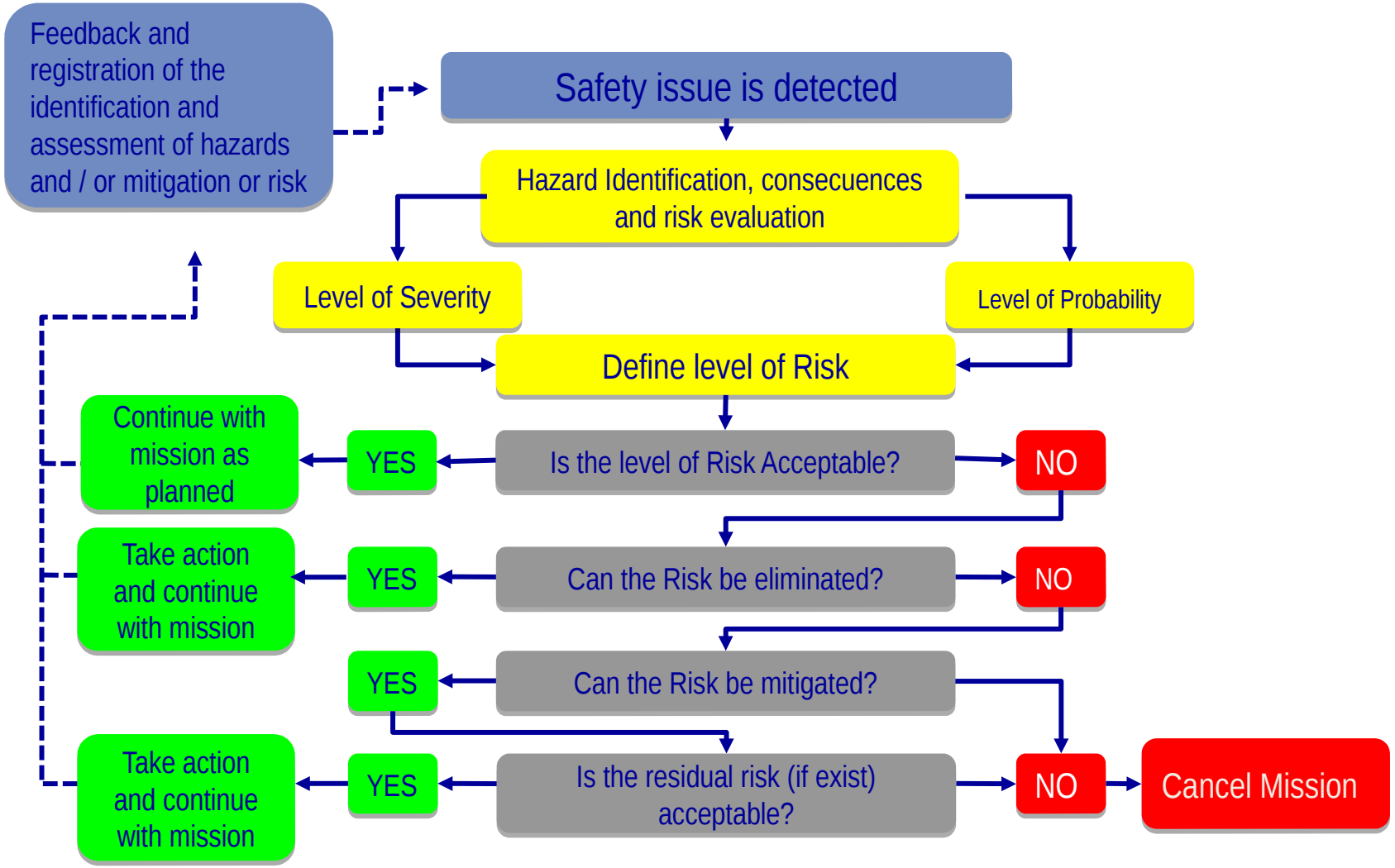
- Risk Mitigation = Risk control

- Mitigate - Smooth, less severe or less severe

Risk Control / Mitigation Strategies

- Avoid exposure: When the risks outweigh the benefits of continuing the operation or activity, cancel the operation or activity.
- Reduce exposure: frequency of operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of risk accepted.
- Segregation of exposure: action is taken to isolate the effects of the consequences of the hazard, or redundant layers of protection against risks are introduced.

Risk Management process



Bow Tie - UAS

AM11	Autorrotaciones básicas		Fecha:
			Acualizado:
			Revisión: 0
			Nivel de riesgo inicial
Modelo Heli:	UAS:	a) Inadecuada gestión de las RPM b) Heli desconfigurado en senda / <300 ft	Inaceptable
R22 / R-44			Nivel de riesgo corregido
			Tolerable

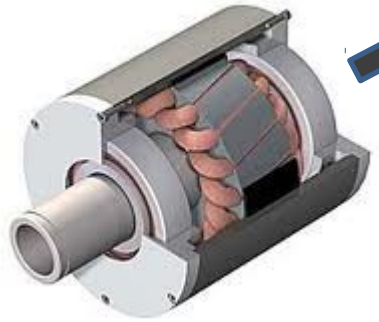
Peligro Nº	Fecha Act	Descripción	Explicación del Peligro	Probabilidad	Severidad	Resultado	Prevención	Probabilidad	Severidad	Resultado	Implementado S/N	Documentado S/N	Ref. Documental
AM11-01		Tipo de rotor principal (baja inercia)	El tipo de rotor de baja inercia hacen necesaria la acción inmedita por parte de la tripulación para la conservación de la energía del RP, pudiendo sufrir caídas como sobre velocidades del RP	Ocasional	Mayor	Inaceptable	Briefing previo. No sorprender, avisar del corte de gases y realizarlo a medio recorrido del colectivo. Si se desestabilizan las RPM, ABORTAR la maniobra. El FI corta gases SIEMPRE	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-02		Control de RPM - Colectivo	El tipo de rotor de baja inercia hacen necesaria la acción inmedita por parte de la tripulación para la conservación de la energía del RP, pudiendo sufrir caídas como sobre velocidades del RP	Ocasional	Mayor	Inaceptable	Briefing previo. Aplicaciones suaves de colectivo. Evitar "perseguir" las vueltas. Si se desestabilizan las RPM, ABORTAR la maniobra. FI con la mano en el puño de gases SIEMPRE	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-03		Control de RPM - Cíclico	Cabeceos excesivos que dificultan en control de las RPM	Ocasional	Mayor	Inaceptable	Briefing previo. Establecer velocidad constante. Evitar "perseguir" las vueltas. Si se desestabilizan las RPM, ABORTAR la maniobra. FI con la mano en el puño de gases SIEMPRE	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-04		Calefacción del carburador	Posibilidad de acreección de hielo por el ajuste bajo de potencia	Remoto	Peligroso	Inaceptable	Realizar las comporbaciones previas según procedimiento y aplicación "full carb heat" previo a la entrada en autorrotación	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-05		Régimen de descenso	Configuración inadecuada de la aeronave, prestar atención al trimado (pedales), que aumentan el régimen de descenso	Remoto	Peligroso	Inaceptable	Realizar escaneado constante de los parámetros que incluyan la bola y el ROD	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-06		Heli desconfigurado < 300 ft	El heli, al alcanzar los 300ft AGL, no está con "planos nivelados", velocidad en rango (según modelo) y RPM en verdes, generando una carga de trabajo excesiva que puede poner en peligro la seguridad de la aeronave	Ocasional	Mayor	Inaceptable	Call out y comporbaciones, si al alcanzar los 300 ft AGL, no se cumplen los parámetros anteriormente descritos, ABORTAR la maniobra	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-07		Idoneidad de inicio de la maniobra	Tener en cuenta los factores para el inicio o no de la maniobra: alt, zona, seguridad, motor, mirar fuera	Remoto	Peligroso	Inaceptable	Aplicación de la regla HASEL	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-08		Contacto del heli con el suelo - FLARE	Posible contacto con la cola durante el flare	Remoto	Peligroso	Inaceptable	Aumento de la altura de recuperación entre 100-50 AGL	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr
AM11-09		Contacto del heli con el suelo - NIVELADO	Posible contacto de los patines durante el nivelado y posterior acolchado. Esta situación se agrava y dicho contacto se produce con velocidad horizontal combinado con destrimado o movimientos laterares (ver Vuelcos)	Remoto	Peligroso	Inaceptable	Aumento de la altura de nivelado a 30 ft	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr

Input

Data:

- ✓ Operational
- ✓ Financial
- ✓ HR
- ✓ Legal
- ✓ …

SMS



Output

Strategic Decisions

Programas de ejecución

- ✓ CFIT
- ✓ TEM/CRM
- ✓ Slinging safety
- ✓ …

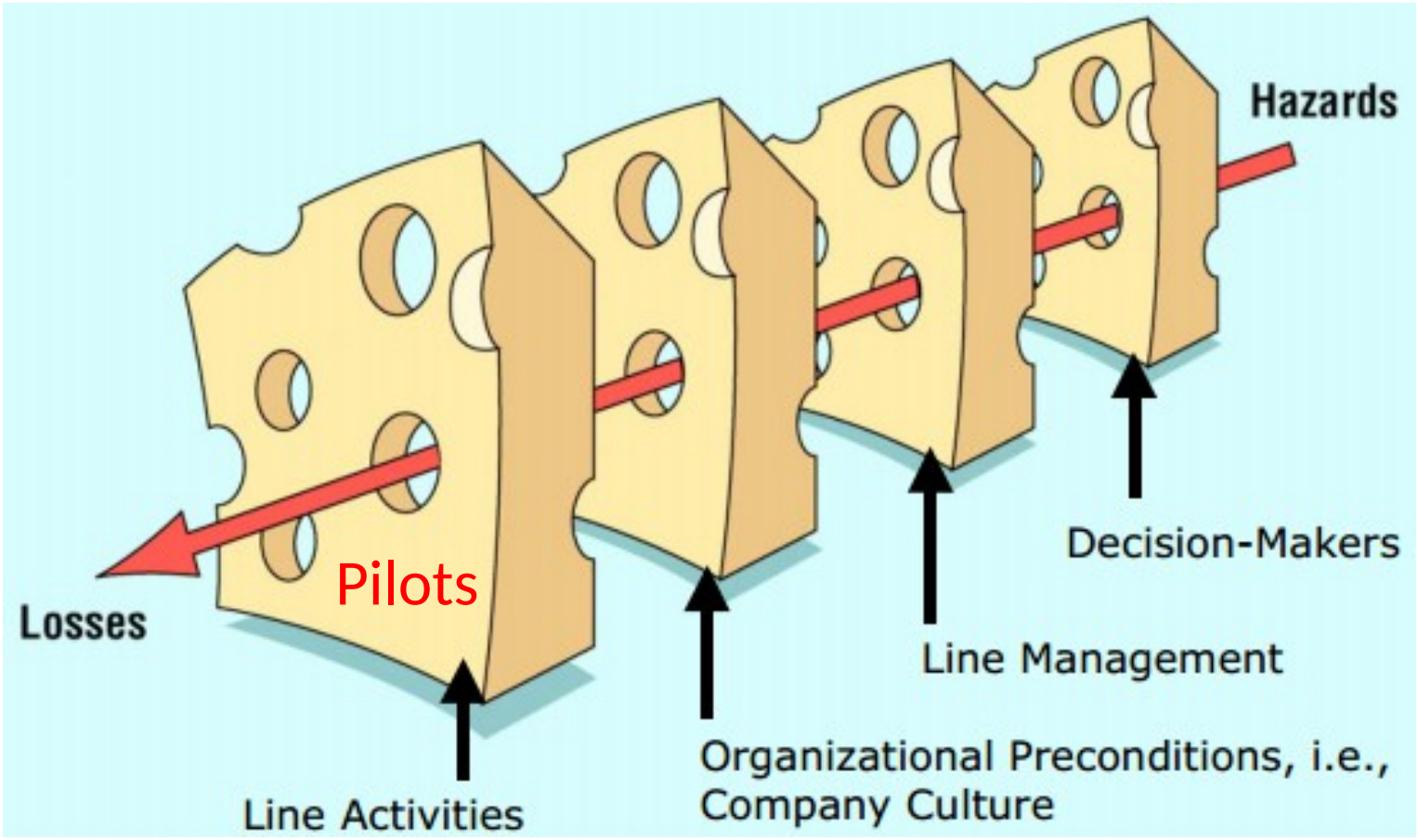
Risk Management Process

Pilot role in SMS

Responsibilities

- Where are the pilots? Simply customers?
- “Users & Victims” of the system.
- Pilots are safety managers.
- Pilots as active player within our SMS
- New approach to managing risks where pilots are the “last line of defense”.
- Pilots are the only part of the system able to tackle both Active & Latent Conditions
- TEM.

Safety Risk Management



Safety Risk Management

- SMS is to protect ourselves against active & latent conditions.
- Pilots are the only part of the system able to tackle both Active & Latent Conditions.
- A top-down hazard identification and risk analysis plan is needed.
- Ongoing process in which feedback is key.

Training

- Compliance vs Training
- Training the Pilots in SMS
- Lots of questions and just one answer:
  - By reducing certain events the cost benefit ratio automatically increases… so does our safety performance!!!
- Risk Management Training is essential.

Conclusions

- Safety managment need from resources.
- CEM have the responsability and the authirity to manage the ornganizational risk of the company.
- All personnel has an active role in SMS.
- SMS, risk management is essential.

Conclusion

- Includes all aspects and operations of the company.
- Focus in process and consecuences.
- Data driven.
- Manage the limited resources.
- Strictly documented.
- Steep by steep.
- Strategic planification rather than impulses.

WFP

World Food Programme

wfp.org

ERP – Emergency Respond Plan

WFP – Safety Workshop

4th- 5th of February, Kathmandu, Nepal

Objectives

- Be prepare.
- How to act and response to an emergency.

Agenda

- What is an ERP.
- Activation.
- Who is who.
- How to act.

ERP

- Have a plan.
- It establishes guidelines to react to an emergency call.
- Acctivation of the CMC (Crisis Management Center)
- Procedures.
- Roles of personnel.
- Communicate.
- Part of SMS-SMM.

ERP - Activation

- Any event can activate the ERP:
  - Accident / serious incident / malfunction.
  - Desastres en las instalaciones.
  - Meteorological or natural disasters.
  - Food or
  - Labour accidents, suicides.

ERP - Organization

- Define a unique contact point…
- Keep track of all actions carried out.
- Maintain the normal activities of the company.
- Unless it becomes esential, leave the area.
- Avoid unnecesary communications.
- DO NOT talk with media.

ERP - CMC

- Who is in the CMC.
- Activation.
- Levels of response:
  - Level 1:
    - Potential event, no inmediate consecuences.
    - Pre-alert.
  - Level 2:
    - Potential consecuences in safety.
    - All memeber must attend the crisis management center in order to have all the data and thus be able to react immediately.
- Material CMC.
- Manuals and annexes.

CMC Composition

ERP - Responsibilities

- Must be described in ERP-Manual.
- Clearly defined.
- Communicated.
- Training.
- All personnel.

	ERP Anexo A Recogida de Datos	Manual de Gestión Revisión: 0 Fecha: Agosto 2013

FORMULARIO DE RECOGIDA DE DATOS DE AVERIA/INCIDENTE/ACCIDENTE

FECHA:	HORA:
Datos de la persona que da el aviso:	
Detalles de la aeronave: - Tipo - Matrícula	Tripulación:
Lugar del accidente:	
Breve descripción del evento:	
Lesiones de la tripulación:	
Daños de la aeronave:	
Daños a terceros (materiales y/o personales):	
Otra información:	
Recogida de datos realizada por:	Firma:

After it happens

- No procedures…
- Erratic information.
- Calm down!
- Are they ok?
- Initial call AAIB (CIAIAC).
- Go to the accident site.
- Gather information.
- Recover the wreckage.
- All MUST be documented!!!

Conclusions

- We need a plan.
- Re evaluate your plan.
- Preparation.
- Documented.
- Lessons learned!!

WFP

World Food Programme

wfp.org

Case Study

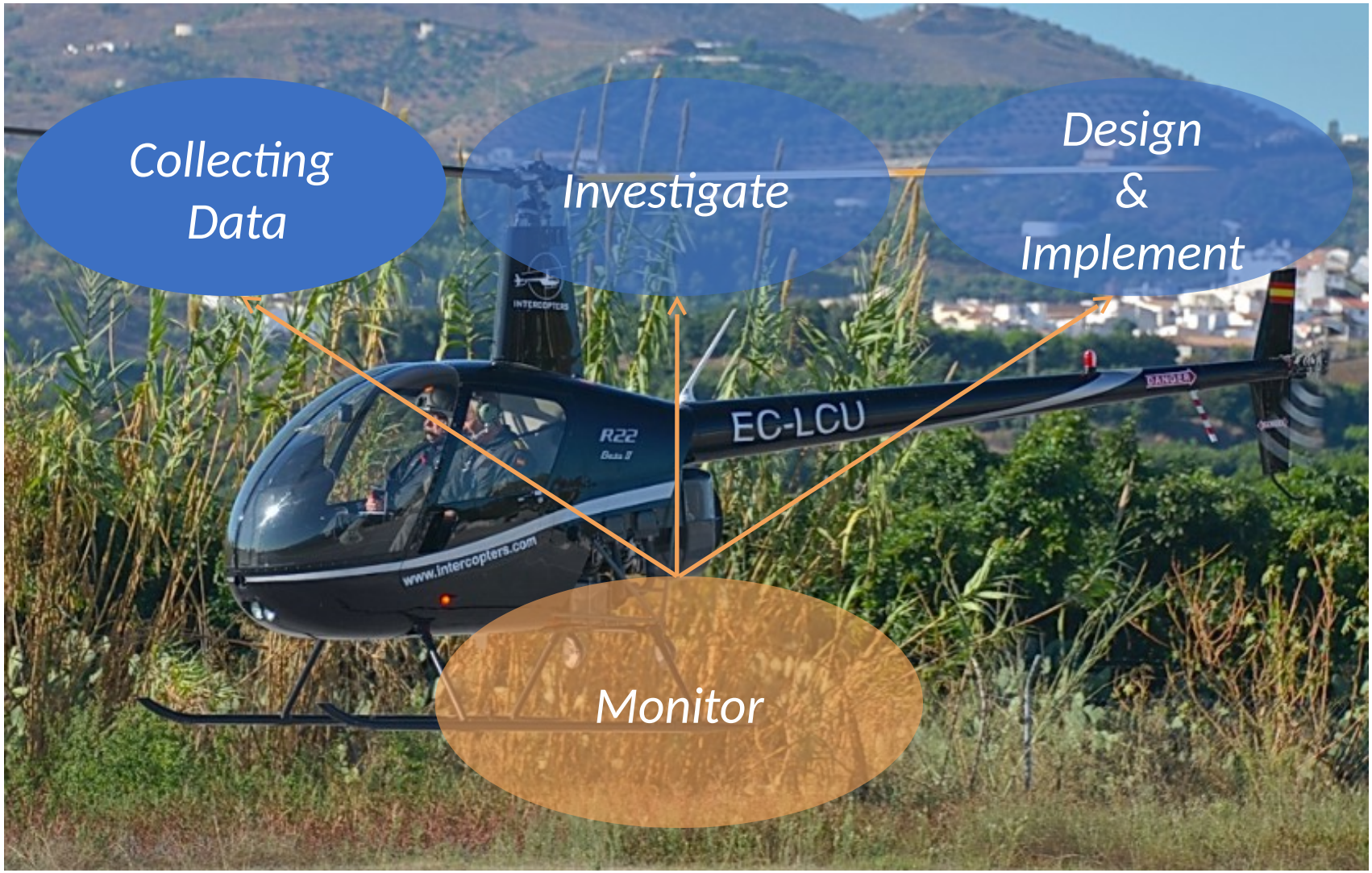
WFP – Safety Workshop

4th- 5th of February, Kathmandu, Nepal

Objectives

- Show the system working.

Autorotations – Managing the Risks

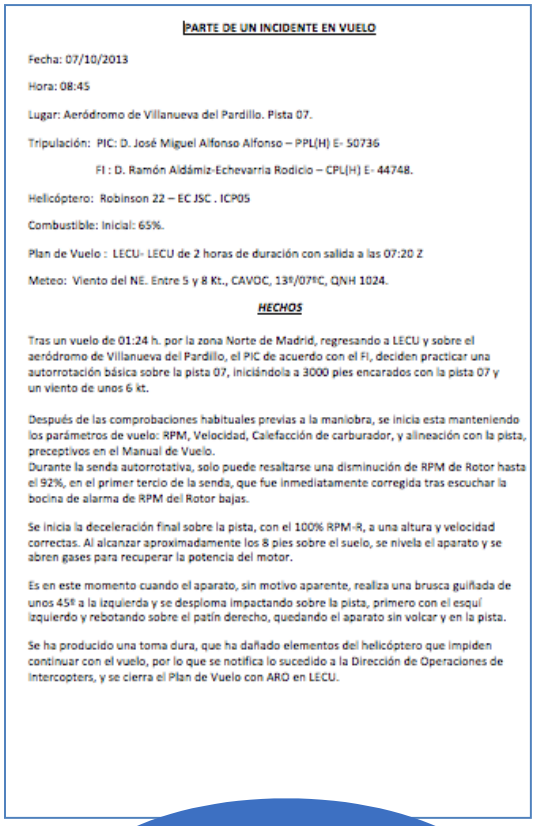


ISD Model: Instructional System Design

Collecting Data

- Collecting is not the aim but the way
- A good reporting system is key

New Reporting System



PARTE DE UN INCIDENTE EN VUELO

Fecha: 07/10/2013

Hora: 08:45

Lugar: Aeródromo de Villanueva del Pardillo. Pista 07.

Tripulación: PIC: D. José Miguel Alfonso Alfonso – PPL(H) E- 50736

FI : D. Ramón Aldámiz-Echevarría Rodicio – CPL(H) E- 44748.

Helicóptero: Robinson 22 – EC JSC . ICP05

Combustible: Inicial: 65%.

Plan de Vuelo : LECU- LECU de 2 horas de duración con salida a las 07:20 Z

Meteo: Viento del NE. Entre 5 y 8 Kt., CAVOC, 13º/07ºC, QNH 1024.

HECHOS

Tras un vuelo de 01:24 h. por la zona Norte de Madrid, regresando a LECU y sobre el aeródromo de Villanueva del Pardillo, el PIC de acuerdo con el FI, deciden practicar una autorrotación básica sobre la pista 07, iniciándola a 3000 pies encarados con la pista 07 y un viento de unos 6 kt.

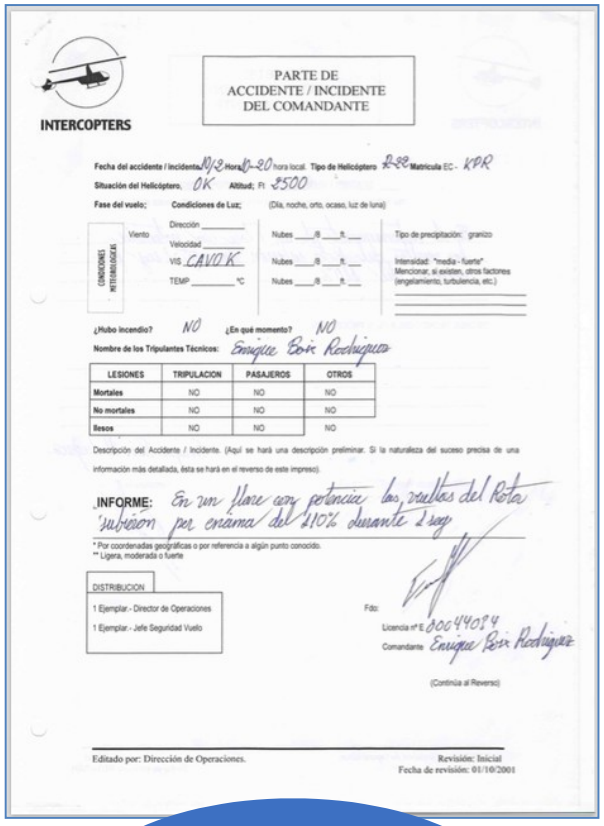
Después de las comprobaciones habituales previas a la maniobra, se inicia esta manteniendo los parámetros de vuelo: RPM, Velocidad, Calefacción de carburador, y alineación con la pista, preceptivos en el Manual de Vuelo.
Durante la senda autorrotativa, solo puede resaltarse una disminución de RPM de Rotor hasta el 92%, en el primer tercio de la senda, que fue inmediatamente corregida tras escuchar la bocina de alarma de RPM del Rotor bajas.

Se inicia la deceleración final sobre la pista, con el 100% RPM-R, a una altura y velocidad correctas. Al alcanzar aproximadamente los 8 pies sobre el suelo, se nivela el aparato y se abren gases para recuperar la potencia del motor.

Es en este momento cuando el aparato, sin motivo aparente, realiza una brusca guiñada de unos 45º a la izquierda y se desploma impactando sobre la pista, primero con el esquí izquierdo y rebotando sobre el patín derecho, quedando el aparato sin volcar y en la pista.

Se ha producido una toma dura, que ha dañado elementos del helicóptero que impiden continuar con el vuelo, por lo que se notifica lo sucedido a la Dirección de Operaciones de Intercopters, y se cierra el Plan de Vuelo con ARO en LECU.

Hand Written Reports



INTERCOPTERS

PARTE DE ACCIDENTE / INCIDENTE DEL COMANDANTE

Fecha del accidente / incidente 10/2 Hora 10-20 hora local. Tipo de Helicóptero R22 Matrícula EC - KDR

Situación del Helicóptero. OK Altitud; Ft 3500

Fase del vuelo; Condiciones de Luz; (Día, noche, orto, ocaso, luz de luna)

CONDICIONES METEOROLÓGICAS

Viento Dirección ____ Velocidad ____ VIS CAVOK TEMP ____ °C

Nubes ___/8 ___ ft ___ Nubes ___/8 ___ ft ___ Nubes ___/8 ___ ft ___

Tipo de precipitación: granizo

Intensidad: "media - fuerte". Mencionar, si existen, otros factores (engelamiento, turbulencia, etc.)

¿Hubo incendio? NO ¿En qué momento? NO

Nombre de los Tripulantes Técnicos: Enrique Boix Rodriguez

LESIONES	TRIPULACION	PASAJEROS	OTROS
Mortales	NO	NO	NO
No mortales	NO	NO	NO
Ilesos	NO	NO	NO

Descripción del Accidente / Incidente. (Aquí se hará una descripción preliminar. Si la naturaleza del suceso precisa de una información más detallada, ésta se hará en el reverso de este impreso).

INFORME: En un flare con potencia las vueltas del Rotor suben por encima del 110% durante 2 seg

* Por coordenadas geográficas o por referencia a algún punto conocido.
** Ligera, moderada o fuerte

DISTRIBUCION

1 Ejemplar.- Director de Operaciones

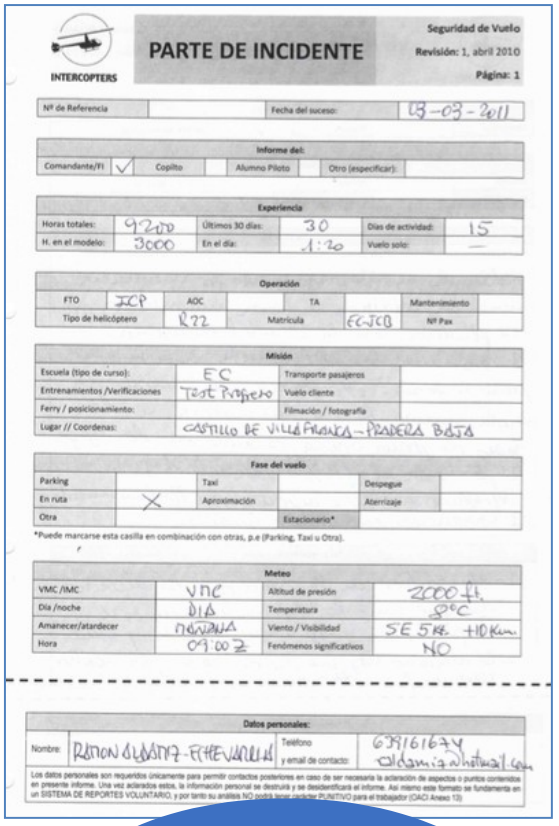
1 Ejemplar.- Jefe Seguridad Vuelo

Fdo: Licencia nº E 30044084 Comandante Enrique Boix Rodriguez

(Continúa al Reverso)

Editado por: Dirección de Operaciones. Revisión: Inicial Fecha de revisión: 01/10/2001

Report Form



INTERCOPTERS

PARTE DE INCIDENTE

Seguridad de Vuelo
Revisión: 1, abril 2010
Página: 1

Nº de Referencia | Fecha del suceso: 03-03-2011

Informe del: Comandante/FI ✓ | Copiloto | Alumno Piloto | Otro (especificar):

Experiencia

Horas totales:	9200	Últimos 30 días:	30	Días de actividad:	15
H. en el modelo:	3000	En el día:	1:20	Vuelo solo:	—

Operación

FTO	ICP	AOC		TA		Mantenimiento	
Tipo de helicóptero	R22	Matrícula		EC-JCB		Nº Pax	

Misión

Escuela (tipo de curso):	EC	Transporte pasajeros	
Entrenamientos /Verificaciones	Test Proficiency	Vuelo cliente	
Ferry / posicionamiento:		Filmación / fotografía	
Lugar // Coordenas:	CASTILLO DE VILLAFRANCA – PRADERA BAJA		

Fase del vuelo

Parking		Taxi		Despegue	
En ruta	X	Aproximación		Aterrizaje	
Otra			Estacionario*		

*Puede marcarse esta casilla en combinación con otras, p.e (Parking, Taxi u Otra).

Meteo

VMC /IMC	VMC	Altitud de presión	2000 ft.
Día /noche	DIA	Temperatura	8ºC
Amanecer/atardecer	NINGUNA	Viento / Visibilidad	SE 5 Kt. +10 Km.
Hora	09'00 Z	Fenómenos significativos	NO

Datos personales:

Nombre: RAMON ALDAMIZ-ECHEVARRIA | Teléfono y email de contacto: 629161674 aldamiz@hotmail.com

Los datos personales son requeridos únicamente para permitir contactos posteriores en caso de ser necesaria la aclaración de aspectos o puntos contenidos en presente informe. Una vez aclarados estos, la información personal se destruirá y se desidentificará el informe. Así mismo este formato se fundamenta en un SISTEMA DE REPORTES VOLUNTARIO, y por tanto su análisis NO podrá tener carácter PUNITIVO para el trabajador (OACI Anexo 13)

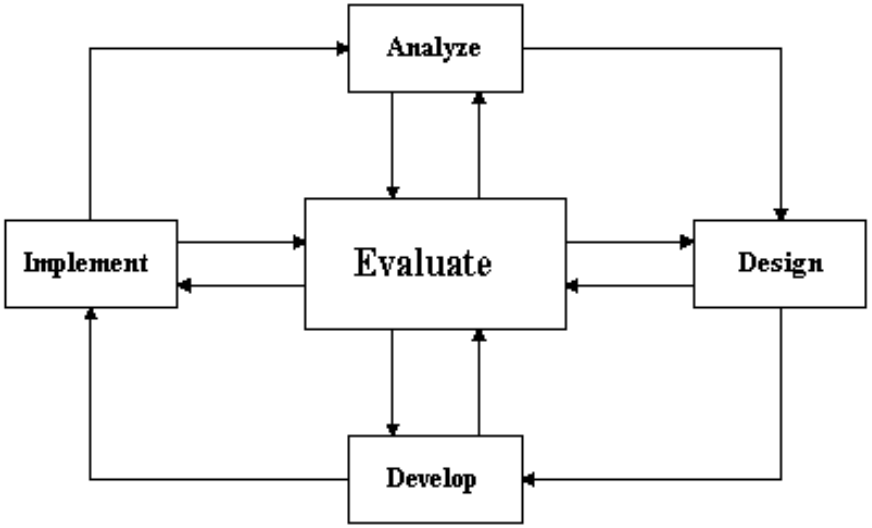
IRF

Exploiting Data

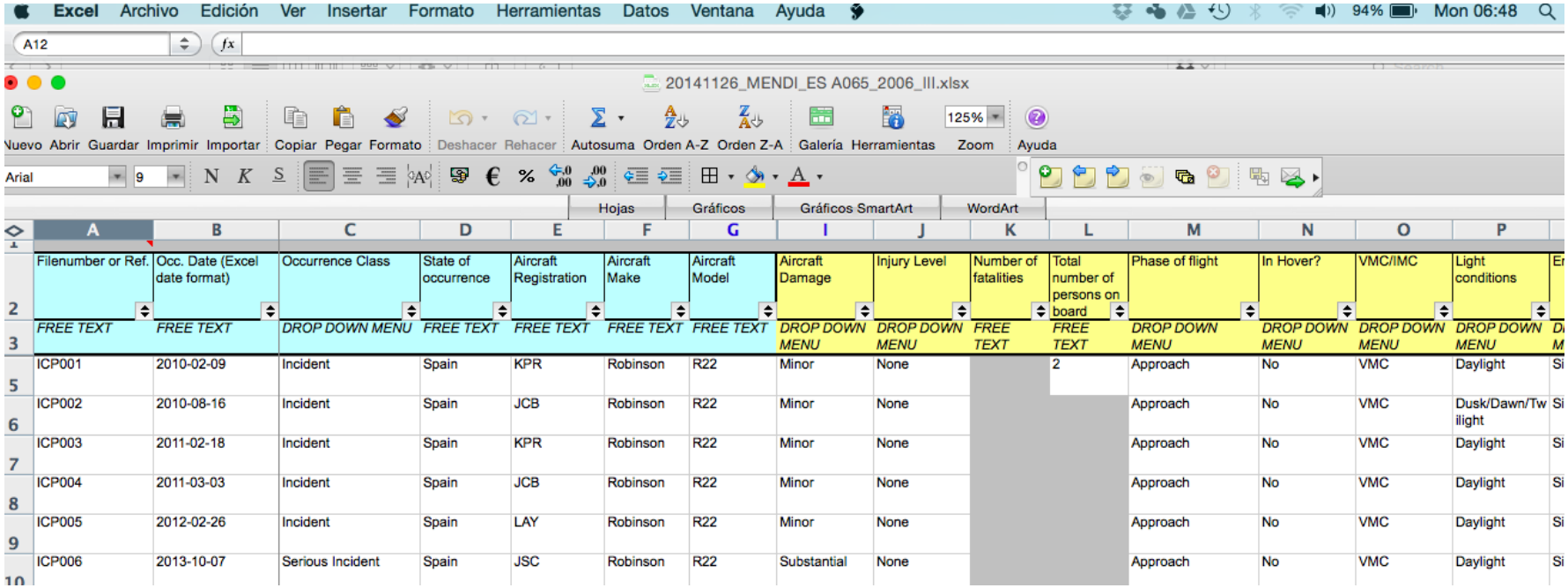
IRF facilitates collecting the appropiate data

ICP Accident Analysis tool: EXCEL based tool that provides us with:

- *General Info*
- Analysis (EHEST SPS, HFACS & HFACS ME)
- Results & Graphics
- Internal Audit of results



Reviewing Ocurrences



	A	B	C	D	E	F	G	I	J	K	L	M	N	O	P
2	Filenumber or Ref.	Occ. Date (Excel date format)	Occurrence Class	State of occurrence	Aircraft Registration	Aircraft Make	Aircraft Model	Aircraft Damage	Injury Level	Number of fatalities	Total number of persons on board	Phase of flight	In Hover?	VMC/IMC	Light conditions	Er
3	*FREE TEXT*	*FREE TEXT*	*DROP DOWN MENU*	*FREE TEXT*	*FREE TEXT*	*FREE TEXT*	*FREE TEXT*	*DROP DOWN MENU*	*DROP DOWN MENU*	*FREE TEXT*	*FREE TEXT*	*DROP DOWN MENU*	*DROP DOWN MENU*	*DROP DOWN MENU*	*DROP DOWN MENU*	*D M*
5	ICP001	2010-02-09	Incident	Spain	KPR	Robinson	R22	Minor	None		2	Approach	No	VMC	Daylight	Si
6	ICP002	2010-08-16	Incident	Spain	JCB	Robinson	R22	Minor	None			Approach	No	VMC	Dusk/Dawn/Twilight	Si
7	ICP003	2011-02-18	Incident	Spain	KPR	Robinson	R22	Minor	None			Approach	No	VMC	Daylight	Si
8	ICP004	2011-03-03	Incident	Spain	JCB	Robinson	R22	Minor	None			Approach	No	VMC	Daylight	Si
9	ICP005	2012-02-26	Incident	Spain	LAY	Robinson	R22	Minor	None			Approach	No	VMC	Daylight	Si
10	ICP006	2013-10-07	Serious Incident	Spain	JSC	Robinson	R22	Substantial	None			Approach	No	VMC	Daylight	Si

Exploiting Data

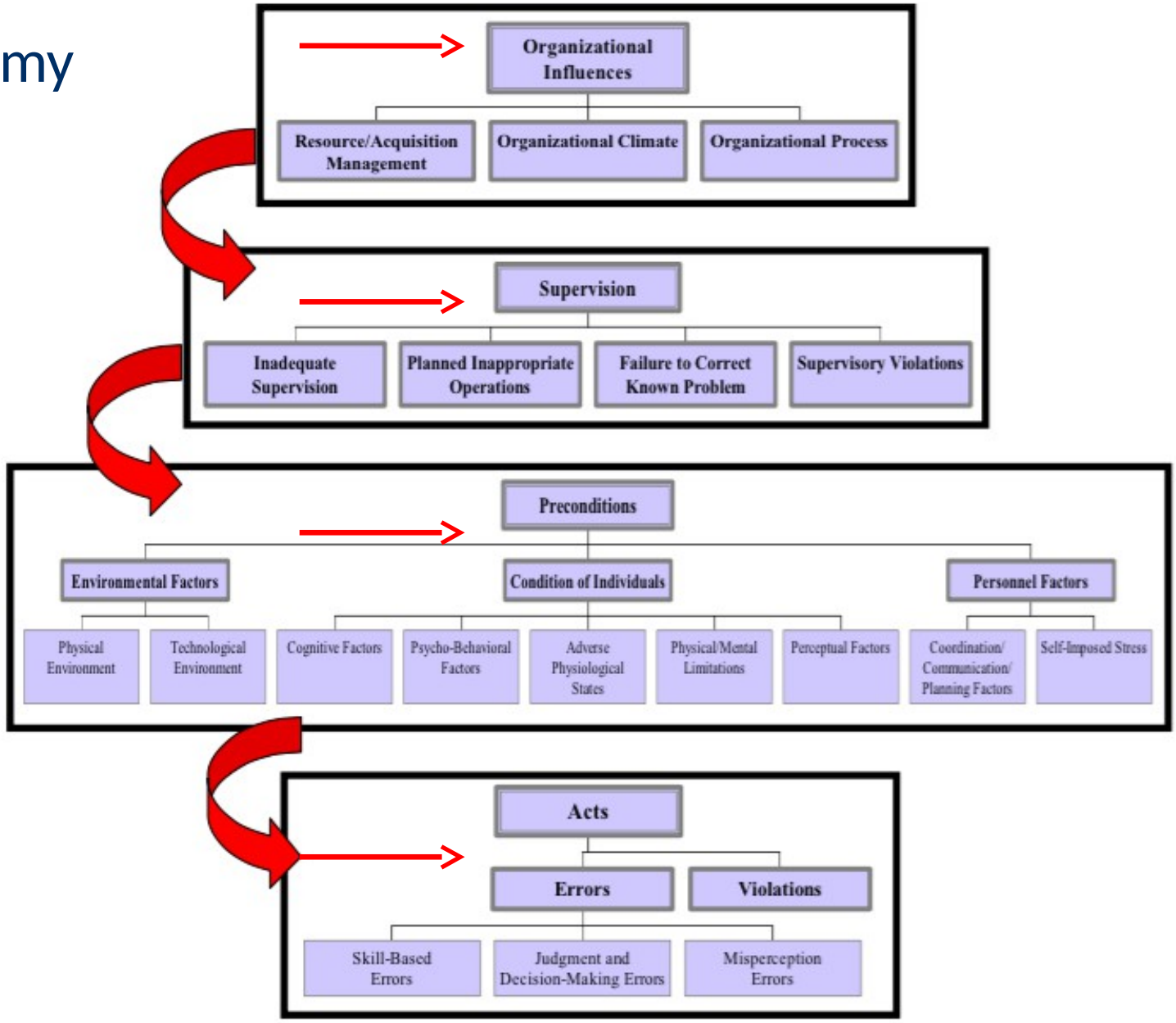
New IRF facilitates collecting the appropiate data.

ICP Accident Analysis tool: EXCEL based tool that provides us with:

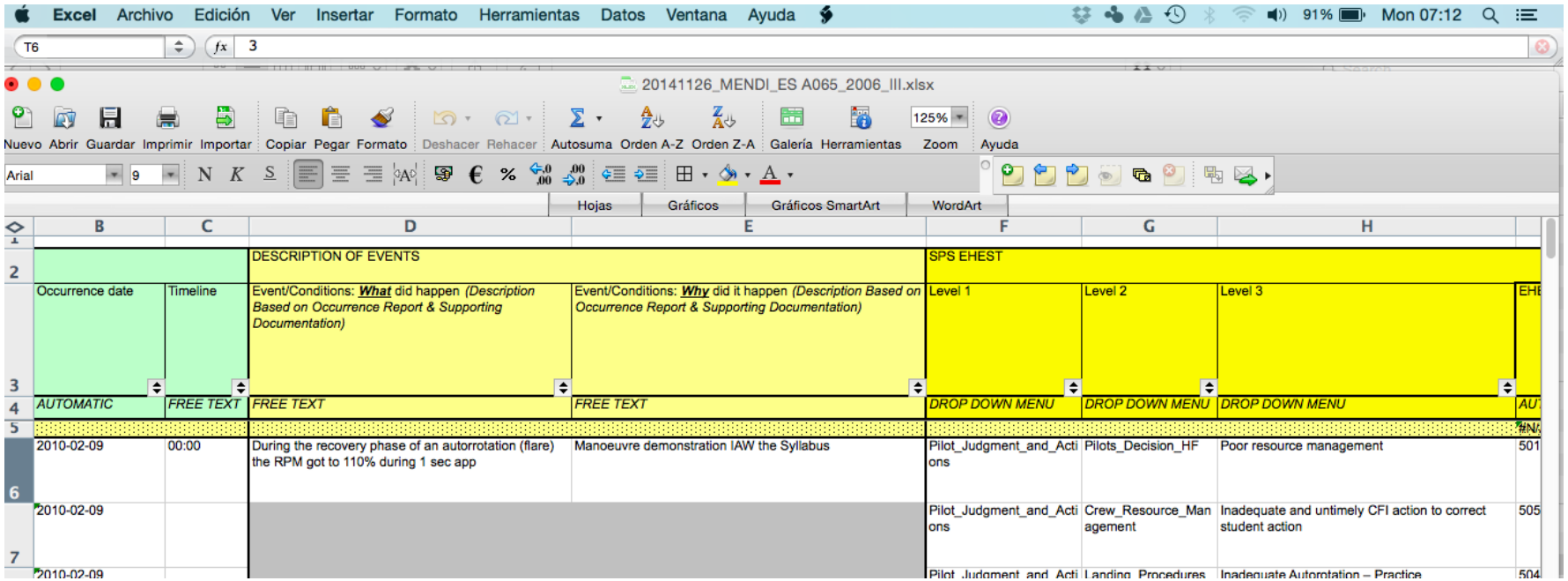
- General Info
- *Analysis (EHEST SPS, HFACS & HFACS ME)*
- Results & Graphics
- Internal Audit of results

The Taxonomy

HFACS



Reviewing Ocurrences



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Exploiting Data

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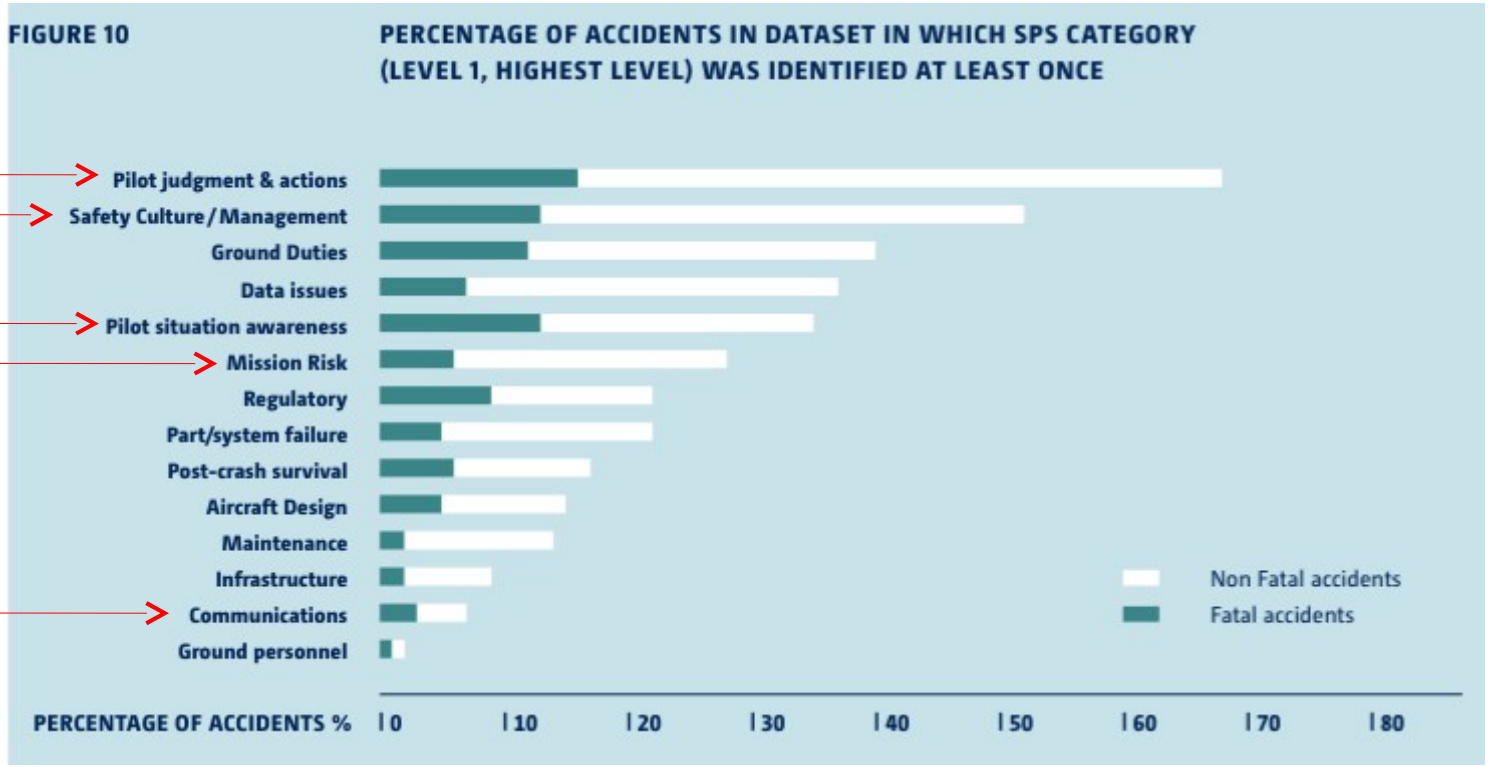
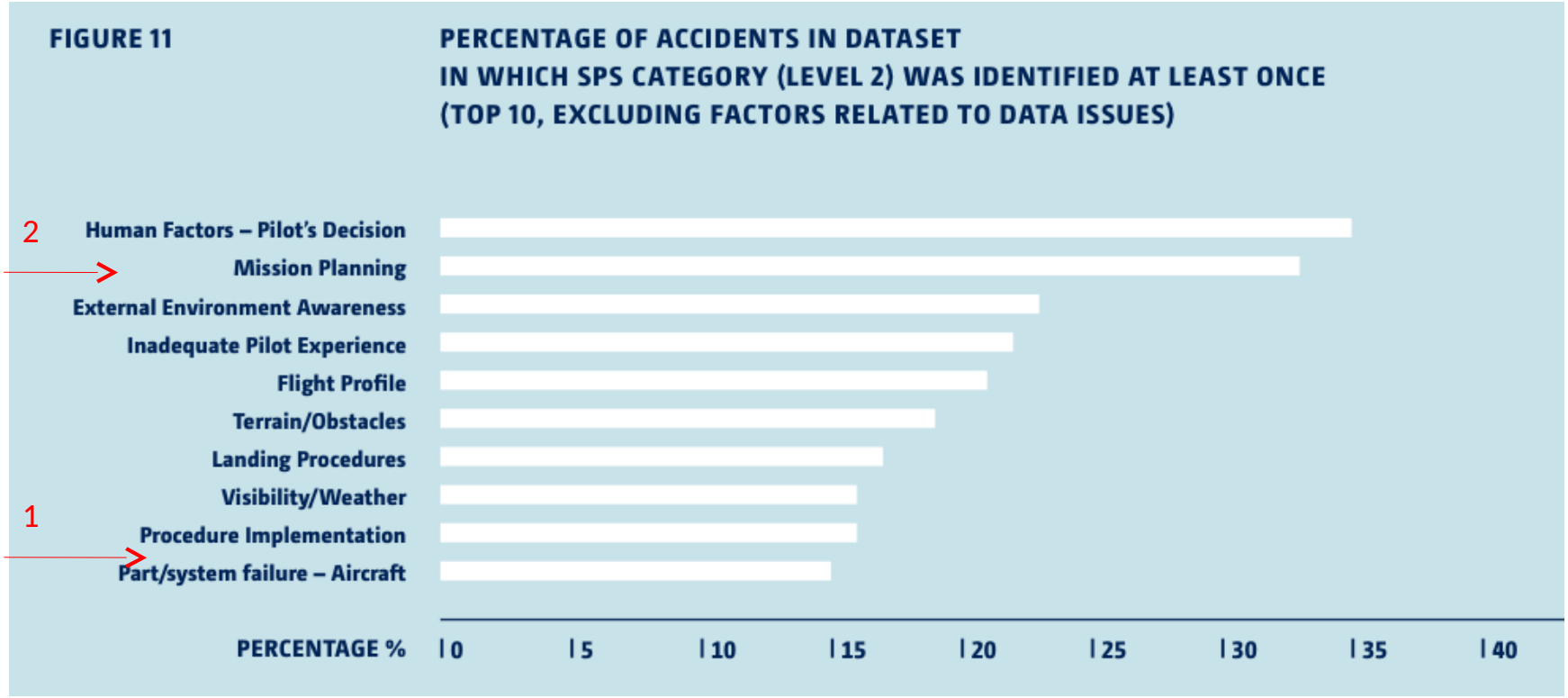
- Results & Graphics
- *Internal Audit of results*

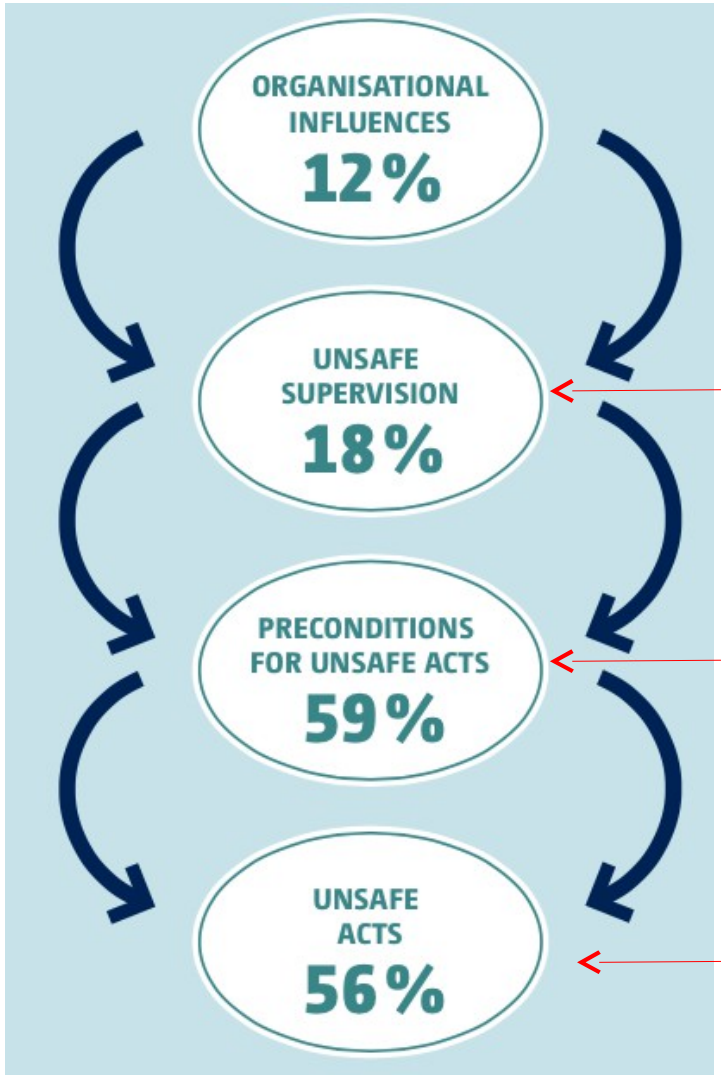
EHEST SPS L1 EHEST & ICP Comparison



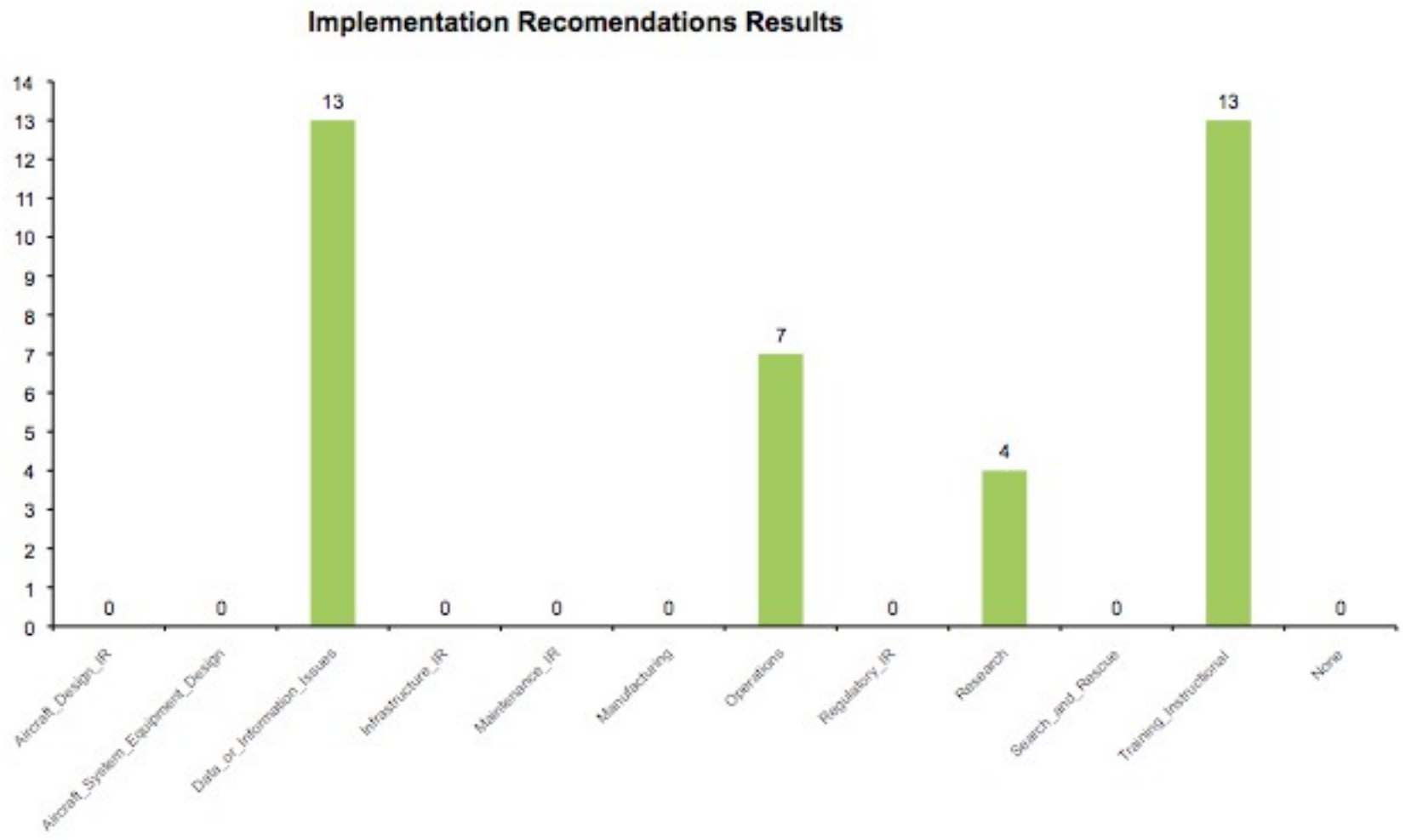
EHEST SPS L2 EHEST & ICP Comparison



EHEST HFACS L1 EHEST & ICP Comparison



Implementation Recommendations



Safety Action Plan Output

INTERCOPTERS | CIRCULAR OPERATIVA | Escuela: FTO-031 | Revisión: 0 julio 2011 | Ref: CO-10/11

CO 10/11: Entrenamientos recurrentes y estandarización de las maniobras de vuelo

El objeto de esta Circular Operativa es establecer los **programas de entrenamientos recurrentes** para los pilotos de INTERCOPTERS S.L., así como los **entrenamientos de estandarización** de las maniobras de vuelo para los FIs de la FTO.

ENTRENAMIENTOS RECURRENTES:

Según la Resolución de 5 de julio de 2002 de la Dirección General de Aviación Civil, dentro de los procedimientos operativos específicos para trabajos aéreos se establece el concepto de entrenamiento recurrente.

Para conjugar tanto los vuelos de escuela, como los trabajos aéreos de la compañía, los pilotos se someterán a dicho entrenamiento referido al tipo o clase de aeronave en la que actúa como piloto habitualmente **como mínimo una vez cada doce meses.**

Se especificará en el **programa ERE** (entrenamiento recurrente):

- Procedimientos normales:
  - Planificación del vuelo.
  - Inspección prevuelo.
  - Puesta en marcha.
  - Despegue.
  - Aproximación y aterrizaje.
  - Parada de motor.
  - Uso de equipos y radios.
- Procedimientos de emergencia:
  - Fallos de motor o motores (según modelo).
  - Fallos de governor (según modelo).
  - Fallos de transmisión.
  - Fallos de sistema de impulsión/embrague (según modelo).
  - Fallos de rotor de cola.
  - Fallos de tacómetro (según modelo).
  - Fallos del sistema hidráulico (según modelo).
  - Emergencias de combustible.
  - Emergencias eléctricas.
  - Fuego en la aeronave.
  - Humo en cabina.
  - Luces de aviso.

Intercopters FTO-031 | Circular Operativa | PÁGINA 1

INTERCOPTERS | CIRCULAR OPERATIVA | Escuela: FTO-031 | Revisión: 0 julio 2011 | Ref: CO-10/11

CO 10/11: Entrenamiento de la autorrotación

El objeto de esta Circular Operativa es **normalizar la instrucción de la maniobra de autorrotación** dentro de los cursos normalizados, entrenamientos recurrentes y verificaciones de competencia en INTERCOPTERS FTO. Esta CO complementa la SN001 de esta compañía, la cual sigue en vigor.

LA AUTORROTACIÓN:

Una autorrotación es una maniobra que permite a un helicóptero realizar un descenso de emergencia en caso de una pérdida de potencia debida a un fallo de motor, del sistema de impulsión o de la transmisión. Practicando esta maniobra, el flujo de aire se invierte, de modo que durante el vuelo normal el aire fluye de arriba hacia abajo impulsado por el rotor, y en una autorrotación el aire circula en sentido inverso, aumentando a su paso la velocidad de rotación de las palas.

Podemos dividir la autorrotación en 4 fases bien deiferenciadas: entrada, senda, flare y toma.

LA PRÁCTICA:

Los instructores deben seguir una regla de oro antes y durante la práctica. Los anglosajones la denominan HASEL:

- Height: ¿Tenemos la altitud adecuada (mínimo 700 ft AGL) para alcanzar el punto de toma y recuperar la maniobra en caso de errores en la misma o pérdida de control por parte del alumno?
- Area: Zona de toma adecuada, previamente reconocida y sin obstáculos.
- Safety: no hay objetos sueltos en la cabina. Realizar acciones suaves y de poca amplitud sobre los controles. Nunca sorprender al alumno. Evitar la sobre confianza y estar siempre acompañando la maniobra con las manos cerca de los controles.
- Engine: Antes de cortar los gases comprobar que el motor tiene la temperatura apropiada, que la calefacción está a tope y que una vez cortados, confirmar que el motor pasa a ralentí. Es conveniente realizar una comprobación de "cortado de gases" en tierra antes de iniciar la autorrotación.
- Look out: Mira el área que has escogido para la toma y comprueba que no hay obstáculos (personas, animales, etc). Recomendamos que realices la siguiente rutina: Vueltas-Velocidad-Fuera (mirar fuera)

Los puntos principales que se deben observar para su realización son:

- Velocidad:
  - R22: 60-65 KIAS.
  - R44: 65-70 KIAS.

Intercopters FTO-031 | Circular Operativa | PÁGINA 1

Training Manual

	Manual básico de Maniobras	Revisión: 2
		Fecha: Enero 2014

UNIDAD 11

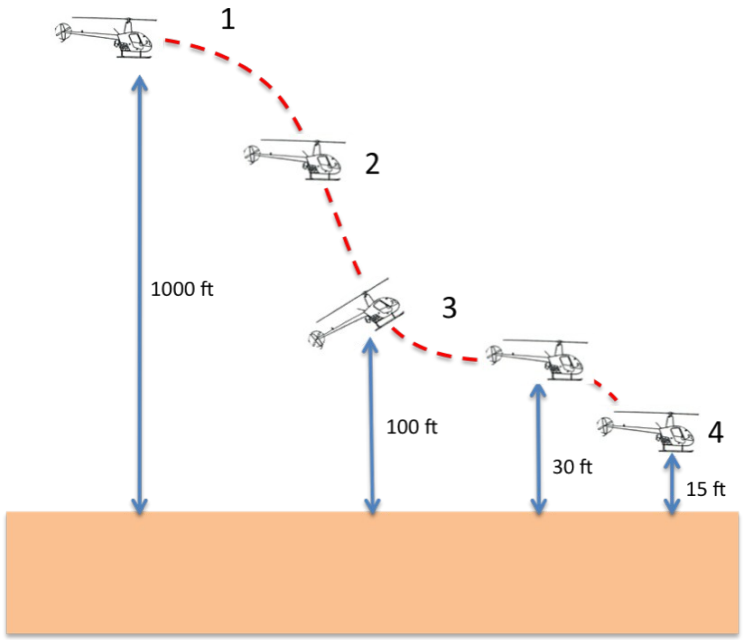
AUTORROTACIÓN BÁSICA

La autorrotación es una condición de vuelo en la que las palas del helicóptero mantienen sus RPM debido al flujo de aire que las empuja de abajo a arriba, es decir, con el helicóptero descendiendo. Esta maniobra permite a un helicóptero realizar un descenso de emergencia en caso de una pérdida de potencia debido a un fallo de motor o de la transmisión. Para que esto se produzca es necesario que exista un mecanismo que desembrague el rotor del motor. Como ya sabes, la resistencia de las palas al girar es vencida por el impulso que trasmite el eje de salida del motor (cigüeñal), al rotor a través del mástil y de la caja de engranajes. Si esta conexión fuera rígida, al pararse el motor se pararía el rotor. Para contrarrestarlo, a todos los helicópteros se les dota de un sistema llamado: **rueda libre**, que permite desconectar el rotor del motor, haciendo que las palas puedan girar libremente. Si se para el motor (ó deliberadamente pasamos los gases a ralentí), veremos que las agujas de motor y rotor se separan, cayendo a 0 la ERPM si se ha parado el motor o a ralentí si hemos cortado gases, y quedando en su sector normal las RRPM. Inmediatamente el helicóptero perderá altura y caerá. Si en ese momento le damos a las palas el mínimo ángulo de paso no habrá tracción hacia arriba y el flujo de aire en la caída será de abajo a arriba, con la suficiente fuerza como para mantener las RPM del rotor en verde y de esta manera poseer una energía potencial suficiente para un descenso controlado y frenar la caída en un momento dado.

11.1. CONSIDERACIONES PREVIAS

Según las estadísticas a nivel mundial, la práctica de la autorrotación es una de las principales causas de incidentes y accidentes en los helicópteros. Además es también fuente de daños al material, sobre todo sobre velocidades del rotor principal (ver las **Circulares Operativas**). Entre los factores desencadenantes podemos mencionar, la falta de briefings previos a la sesión, falta de control en los parámetros principalmente en las RPM, elección inadecuada del área de prácticas o meteorología, entre otros. Por tanto es prioritario el estudio y análisis con tu FI de esta unidad para mantener al máximo posible la **seguridad** en la práctica de esta maniobra.

E-ATO-234-01		PÁGINA 11-1



Resumen de nivel de riesgo corregido por maniobras

AM REF	Ejercicio aéreo	Preflight check	Towing	Fuelling	Starting	Taxiing	Take-off	Climb < 500 Ft/ground	Climb > 500 Ft/ground	Level flight	Maneuvering	Descent> 500 Ft/ground	Final approach	Hover OGE	Hover IGE	Landing	Engine shutdown	Post-flight check
AM-01	Acomadación	Aceptable	N/A	N/A	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Aceptable	Aceptable	Aceptable	Tolerable	Aceptable	Aceptable	Aceptable
AM-02	Controles de vuelo	N/A	N/A	N/A	N/A	Tolerable	Tolerable	Aceptable	Aceptable	Aceptable	Tolerable	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Aceptable	Aceptable
AM-03	Comprobaciones	N/A	N/A	N/A	N/A	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Aceptable	Tolerable	N/A	Aceptable	Aceptable	Aceptable	N/A
AM-04	Vuelo de traslación: Virajes, ascensos, descensos	N/A	N/A	N/A	N/A	N/A	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Aceptable	Aceptable	N/A	N/A	N/A	N/A	N/A
AM-05	Cambios de velocidad en vuelo recto y nivelado	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Tolerable	Tolerable	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AM-06	Maniobras en estacionario: desplazamientos, giros, ejercicios de coordinación	N/A	N/A	N/A	N/A	Aceptable	N/A	N/A	N/A	N/A	Tolerable	N/A	N/A	N/A	Tolerable	N/A	N/A	N/A
AM-07	Tomas y despegues en estacionario	N/A	N/A	N/A	N/A	N/A	Tolerable	N/A	N/A	N/A	Aceptable	N/A	N/A	N/A	Tolerable	Tolerable	N/A	N/A
AM-08	Circuitos de tráficos	N/A	N/A	N/A	N/A	N/A	Tolerable	Aceptable	Aceptable	Aceptable	Tolerable	Tolerable	Tolerable	N/A	Tolerable	Tolerable	N/A	N/A
AM-09	Aproximaciones: normal, tendida y profunda	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Tolerable	Tolerable	N/A	N/A	Tolerable	N/A	N/A
AM-10	Despegues	N/A	N/A	N/A	N/A	N/A	Tolerable	Tolerable	Aceptable	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AM-11	Autorrotación básica	N/A	N/A	N/A	N/A	Tolerable	Inaceptable	Inaceptable	Inaceptable	Tolerable	Tolerable	Tolerable	Tolerable	Inaceptable	Tolerable	Inaceptable	N/A	N/A
AM-12	Maniobras en autorrotación: con virajes de 90/180/360, desde estacionario, a baja velocidad y alta velocidad	N/A	N/A	N/A	N/A	Tolerable	Inaceptable	Inaceptable	Inaceptable	Tolerable	Tolerable	Tolerable	Tolerable	Inaceptable	Tolerable	Inaceptable	N/A	N/A

AM11 - Autorotation

AM11 Autorrotaciones básicas				Fecha:
				Acualizado:
				Revisión: 0
				Nivel de riesgo inicial
Modelo Heli:	UAS:	a) Inadecuada gestión de las RPM b) Heli desconfigurado en senda / <300 ft		Inaceptable
R22 / R-44				Nivel de riesgo corregido
				Tolerable

Peligro Nº	Fecha Act	Descripción	Explicación del Peligro	Probabilidad	Severidad	Resultado
AM11-01		Tipo de rotor principal (baja inercia)	El tipo de rotor de baja inercia hacen necesaria la acción inmedita por parte de la tripulación para la conservación de la energía del RP, pudiendo sufrir caídas como sobre velocidades del RP	Ocasional	Mayor	Inaceptable
AM11-02		Control de RPM - Colectivo	El tipo de rotor de baja inercia hacen necesaria la acción inmedita por parte de la tripulación para la conservación de la energía del RP, pudiendo sufrir caídas como sobre velocidades del RP	Ocasional	Mayor	Inaceptable
AM11-03		Control de RPM - Cíclico	Cabeceos excesivos que dificultan en control de las RPM	Ocasional	Mayor	Inaceptable
AM11-04		Calefacción del carburador	Posibilidad de acreección de hielo por el ajuste bajo de potencia	Remoto	Peligrosa	Inaceptable
AM11-05		Régimen de descenso	Configuración inadecuada de la aeronave, prestar atención al trimado (pedales), que aumentan el régimen de descenso	moto	groso	ptable

AM11 - Autorotation

AM11 Autorrotaciones básicas			Fecha:
			Acualizado:
			Revisión: 0
			Nivel de riesgo inicial
Modelo Heli:	UAS:	a) Inadecuada gestión de las RPM b) Heli desconfigurado en senda / <300 ft	Inaceptable
R22 / R-44			Nivel de riesgo corregido
			Tolerable

Peligro Nº	Fecha Act	Descripción	Explicación del Peligro	Probabilidad	Severidad	Resultado	Prevención	Probabilidad	Severidad	Resultado	Implementado S/N	Documentado S/N	Ref. Documental	Medidas Adicionales o comentarios
AM11-01		Tipo de rotor principal (baja inercia)	El tipo de rotor de baja inercia hacen necesaria la acción inmedita por parte de la tripulación para la conservación de la energía del RP, pudiendo sufrir caídas como sobre velocidades del RP	Ocasional	Mayor	Inaceptable	Briefing previo. No sorprender, avisar del corte de gases y realizarlo a medio recorrido del colectivo. Si se desestabilizan las RPM, ABORTAR la maniobra. El FI corta gases SIEMPRE	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr	
AM11-02		Control de RPM - Colectivo	El tipo de rotor de baja inercia hacen necesaria la acción inmedita por parte de la tripulación para la conservación de la energía del RP, pudiendo sufrir caídas como sobre velocidades del RP	Ocasional	Mayor	Inaceptable	Briefing previo. Aplicaciones suaves de colectivo. Evitar "perseguir" las vueltas. Si se desestabilizan las RPM, ABORTAR la maniobra. FI con la mano en el puño de gases SIEMPRE	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr	
AM11-03		Control de RPM - Cíclico	Cabeceos excesivos que dificultan en control de las RPM	Ocasional	Mayor	Inaceptable	Briefing previo. Establecer velocidad constante. Evitar "perseguir" las vueltas. Si se desestabilizan las RPM, ABORTAR la maniobra. FI con la mano en el puño de gases SIEMPRE	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr	
AM11-04		Calefacción del carburador	Posibilidad de acreección de hielo por el ajuste bajo de potencia	Remoto	Peligroso	Inaceptable	Realizar las comporbaciones previas según procedimiento y aplicación "full carb heat" previo a la entrada en autorrotación	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr	
AM11-05		Régimen de descenso	Configuración inadecuada de la aeronave, prestar atención al trimado (pedales), que aumentan el régimen de descenso	Remoto	Peligroso	Inaceptable	Realizar escaneado constante de los parámetros que incluyan la bola y el ROD	Remoto	Mayor	Tolerable	S	S	MBM Unidad 11 CO Entrenamiento de autorr	

Conclusions I

- It works!! We are safer
- All personel (Pilots) as active player within our SMS
- Training the pilots to safely perform within this new framework is therefore key
- Safety Culture becomes more than a “nice word to have”
- Not simply “users and victims” of the system but “managers”

Conclusions II

- Pilots are the only part of the system able to tackle both Active & Latent Conditions
- New approach to managing risks where pilots are key
- Risk Management Training is vital
- By becoming so technical we cannot forget the Human Factors involvement & Training

WFP

World Food Programme

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GRACIAS

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WFP

World Food Programme

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TEM Training

WFP – Safety Workshop

4th- 5th of February, Kathmandu, Nepal

Agenda

- Why TEM?
- Basic elements.
- Avoid UAS.
- Apply TEM.

¿Why TEM?

- EASA-FCL requirement:
  - Use HF and TEM in pilot training, from *ab initio* up to active pilots (OPC, RT, LC…).
  - Demonstrate appropriate attitudes and behaviors for safe flying.
  - Recognize and manage threats and errors in all phases of flight.
  - TEM = In flight SMS

TEM MODEL

TEM model

- Basics elements:
  - Threats.
  - Errors.
  - UAS: Undesired Aircraft State.

Threats

- External events outside the influence of the crew that increase organizational complexity, and to be managed to maintain the levels of safety.
- Unmanaged or mismanaged threats frequently lead to a UAS.
- Threats have the potential to adversely affect or reduce the levels of safety.
- Manage them can increase their knowledge, prior to or during the flight.
- Knowing the threats allow the crew to create plans to implement measures to minimize the reduction in safety levels.

Category of threats

Category of threats

- **Anticipated**: known or expected by the crew.
- **Unanticipated**: unexpectedly occur quickly and without warning. The crew has to apply or apply skills and knowledge acquired in training or operational experience to maintain safety levels.
- **Latent**: Some may not be obvious or detected by crews in flight.

Category of threats

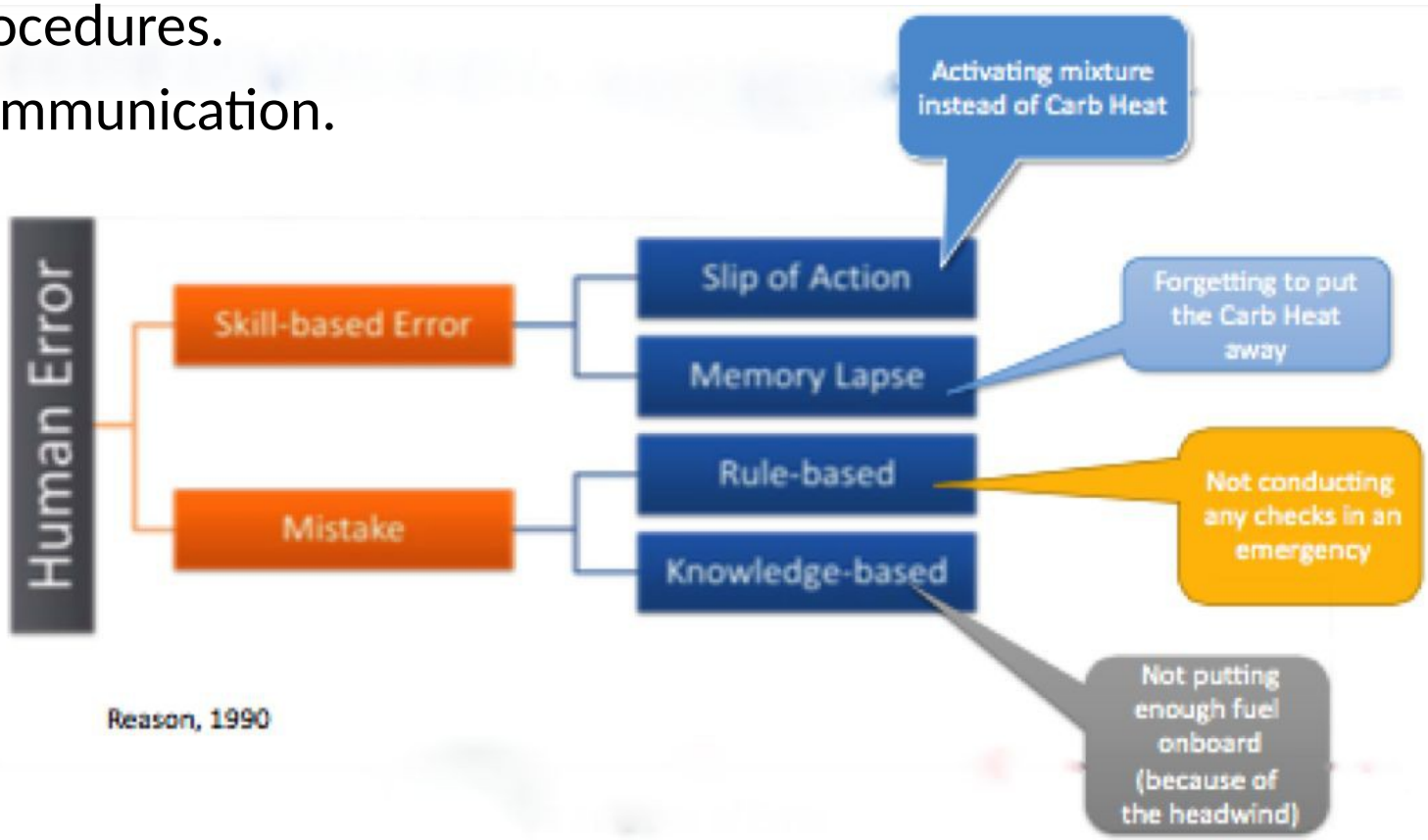
Pilots are “the last line” of defence as threat managers, and a early detection will provide a better response.

Errors

- Actions or inactions BY the flight crew that lead to deviations from their intentions or expectations.
- Types of errors:
  - Slips and Lapses in the execution of the intended action.
  - Mistekes or failures in the plan of action
- Unmanaged or mismanaged errors have the potential to reduce safety margins and could lead to additional erros or UAS…

Errors

- Category of errors in TEM:
  - Aircraft handling.
  - Procedures.
  - Communication.



UAS

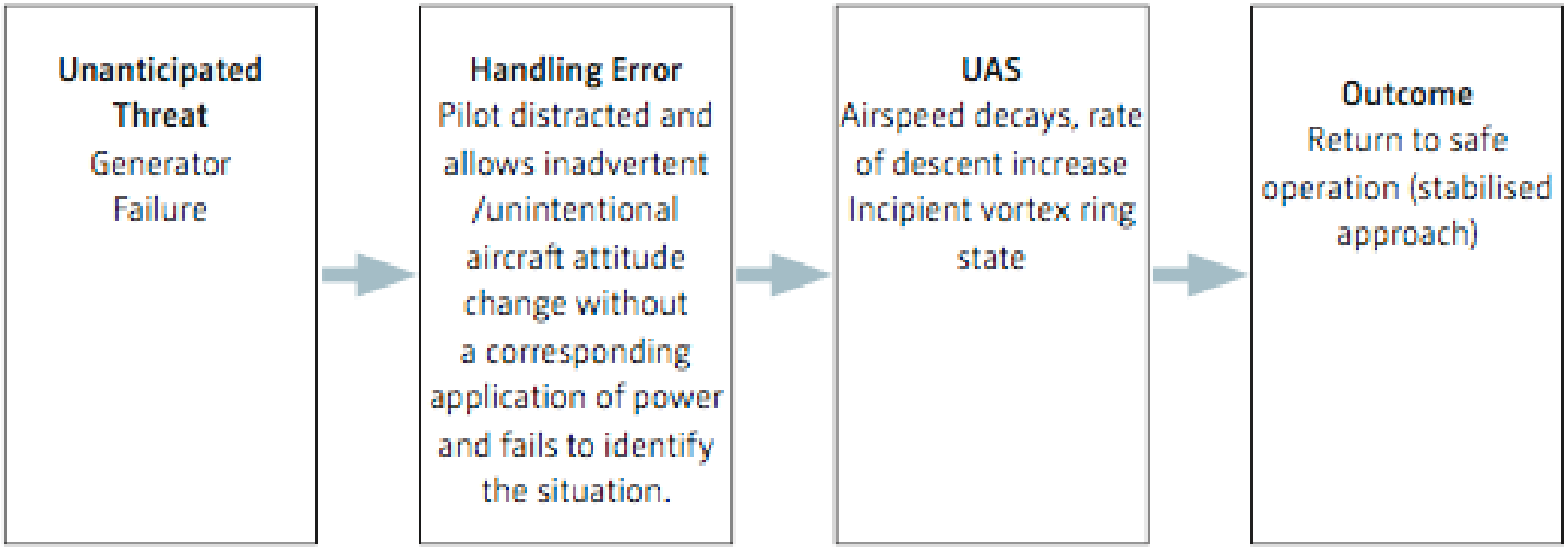
- Are *flight crew induced* helicopter position or speed deviations, misapplication of flight controls, or incorrect system configuration, which reduces safety margins.
- UAS MUST be managed by flight crews, otherwise might be lead in accident.
- Categories:
  - Aircraft handling.
  - Navigation.
  - Incorrect aircraft configuration.

UAS

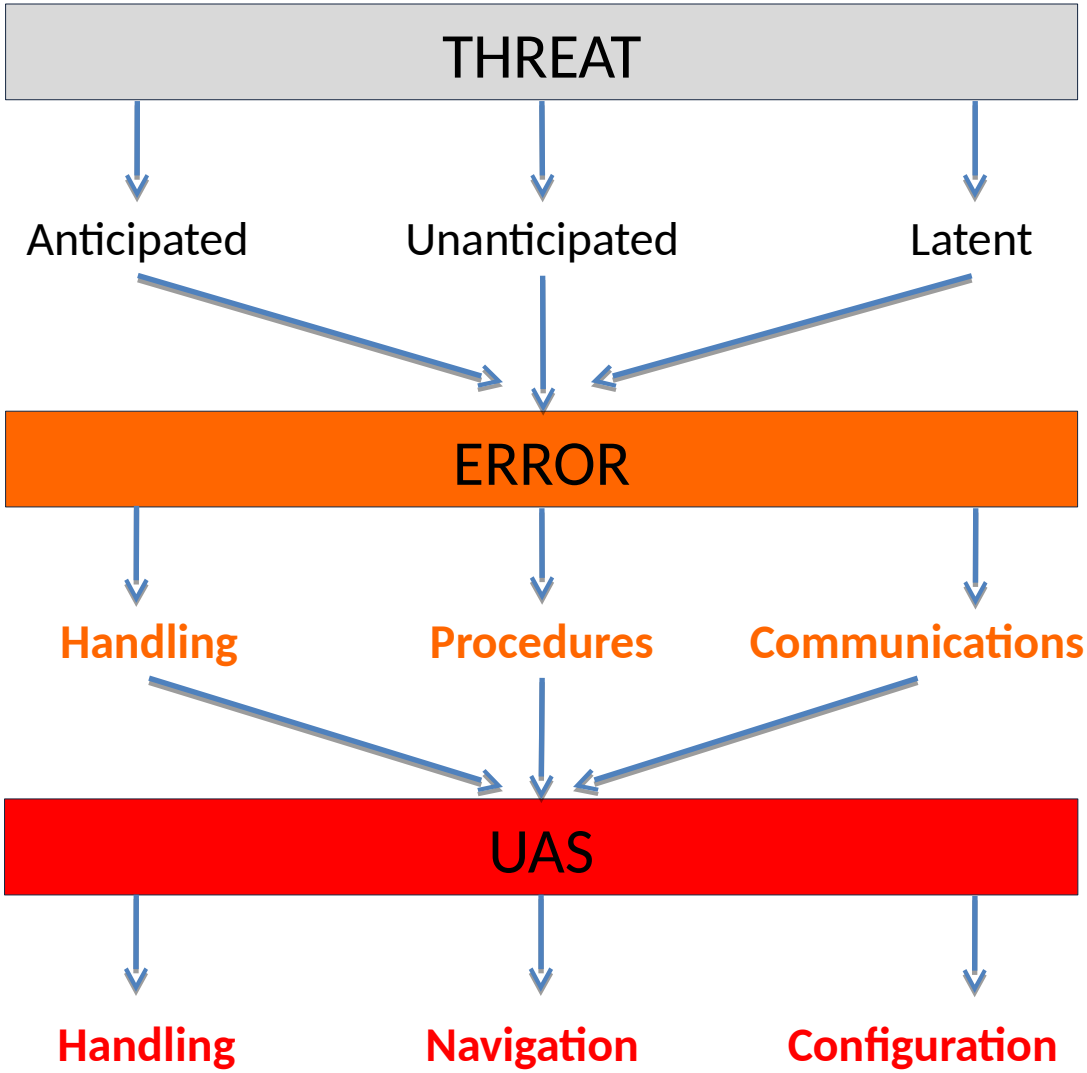
Helicopter handling	Navigation	Incorrect configuration
• Vortex. • LTE. • DVE. • Attitude. • Vertical, lateral or speed deviation. • Unnecessary weather penetration. • Operation outside heli limitations. • Unstable approach. • Continued landing after unstable approach. • Over shooting the landing area. • Hard landing.	• Proceeding towards wrong taxiway or runway. • Wrong taxiway, ramp, pad or holding point. • Unauthorised airspace penetration. • Uncertain possition.	• Systems. • Flight controls. • Automation. • Engine. • Mass and balance.

UAS

- UAS potential outcomes:
  - Return to safe operation.
  - Additional error.
  - Safety occurrence = Incident or accident
- Crews = Threat / Error / UAS Managers



TEM model


THREAT
Anticipated
Unanticipated
Latent
ERROR
Handling
Procedures
Communications
UAS
Handling
Navigation
Configuration

Countermeasures

- Planing, checklist, training, SOP's, CRM…
- Categories of countermeasures:
  - Planed countermeasures: essential for managing anticipated or unexpected threats.
  - Execution countermeasures: for error detection and error response.
  - Review countermeasures: essential for managing the changing conditions of a flight.

Countermeasures

Planing	Execution	Review
• Thorough planing. • Briefing. • Plans, aims, decisions communicated and acknowledged. • Workload assignment and management. • Contingency management with effective strategies. • Identification of theats.	• Active PM and cross check. • Verify aircraft position, settings and crew actions. • Prioritised operational tasks: FLY! • Avoidance task fixation. • Work overload avoidance. • Propper use and mangement of AP. • Inform of every setting made, also AP. • Effective recovery techniques from anomalies.	• Evaluation and modication of plans. • Decision and actions as best alternative. • Investigate, ask and clarify current plans of action. • Not be affraid to ask or express a lack of knowledge. • Nothing taken for granted. • State critical info or solutions with appropiate persistance. • Speak up without hesitation.

TEM Training

- FCL.920: “All instructors shall be trained to achieve the following competences: Integrate Threat and Error Management (TEM) and crew resource management”.
- Threats and error are present in all fases of the flight.
- Manage them is a continous process during the flight.
- Threats (anticipated or unanticipate) are identify by experience, knowledge and training, so we can fight them before and during the flight.
- Latent threat, however, aren’t that obvious and more complex to combat them.
- Train: What happen if…?
- Ask about the countermeasures you will apply.

TEM Training

Pre-Flight	In Flight	Post-Flight
• Spend time on ground anticipating possible threats and develop countermeasures (ie, what alternatives we have if the Wx changes). • BRIEF! (self, crew, passengers) planned procedures before Take-off. • Include anticipated threats and countermeasures in the briefing.	• Brief SOP prior commencing next flight sequence, including anticipated threats and countermeasures. • Prioritise task and manage workload to avoid being overloaded, use checklist. • Identify and manage any UAS. • Recover to stable flight and normal safety margins BEFORE dealing with other threats/error or UAS.	• Analize what threats, errors and UAS were encounter during the flight. • Ask how well/bad were managed and what could have been done differently to improve the management in future flights.

TEM Scenarios

- Foresee a scenario to train recognization and management skills:

Error management training

- Recognition that errors will be present have changed our view from how we identify and manage then instead of trying to avoid them..
- Avoid to pin point only the other crew members mistakes.
- Show how we can minimize such errors.
- Iwhen occurs, implement strategies to manage them.
- Let the people “make” and identify mistakes prior to take control.

Teach UAS management

- Errors and/or threats badly managed may lead into UAS.
- We must train or crews to manage threats and errors before they develop into an UAS.
- Typical UAS:
  - Unsatable HOVER
  - Lateral desplazament during Take-off or Landings.
  - Speeding during taxi.
  - Too fast / slow in final approaches.
  - Unable to maintain altutude and/or heading in flight.
  - Uncorrect RPM management, Tq…

Apply TEM

- Consider our performances using TEM:
  - Maintain effective attention and lookout during flight.
  - Maintain a propper SA.
  - Assess situations and make decisions.
  - Set priorities and manage tasks.
  - Maintain an effective communication and interpersonal relationships.
  - Recognise and manage threats.
  - Recognise and manage errors.
  - Recognise and manage UAS.

Evalute TEM performances

- Determine if the crew member:
  - Recognise, evaluate and manage anticipated and unanticipated threats in every segment of the flight.
  - Avoid or catches error using TEM techniques.
  - Follows SOP's, during the maneuvers and maintains SA in order to avoid and catch errors.
  - Applies strategies to minimize the impacts of errors made.

Conclusions

- TEM: detect, interpretate, adecuate and quickly response to threats, errors ad UAS in all fases of the flight.
- Use, teach and evaluate TEM is not easy.
- Continuosly “ask” about if I’m using TEM.
- Come back from a mission ≠ Safe and apply TEM.

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GRACIAS

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