



# HUMAN FACTORS



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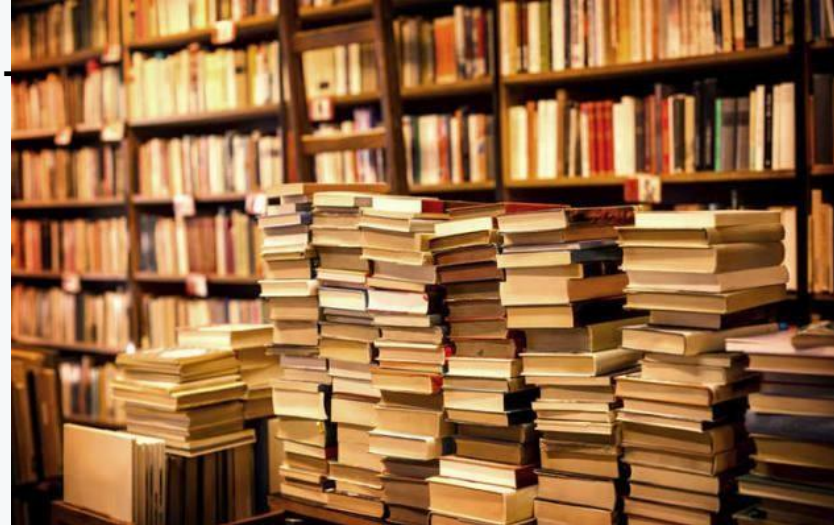
# CRM

*"CRM management is the effective use of all available resources, i.e. equipment, procedures and people, in order to achieve safe and efficient flight operations."*

**ICAO**

# BIBLIOGRAPHY

- **Human Factors Instruction Manual - ICAO**
- **Human Error – JAMES REASON**
- **CRM. An operational philosophy - LEIMANN PATT.**
- **Human Factors in Aviation – Dr OCTAVIO AMÉZCUA PACHECO.**
- **Operational Safety Management Manual – ICAO.**
- **Presentations of the FFHH/CRM/TEM facilitator course**
- **PRIVATE JETS SA.**



# OBJECTIVES

- **That the student analyzes the evolution of the CRM.**
- **Have the student analyze James Reason's model.**
- **That the student identifies the benefits of CRM.**



# SYLLABUS

- **History of CRM.**
- **What is CRM?**
- **James Reason's model.**
- **Spheres of CRM.**
- **Tenerife accident.**
- **Conclusion.**



# HISTORY OF CRM



# HISTORY

"As long as humans are an integral part of the aeronautical system, human capabilities and limitations will influence safety."

ICAO

## 1. COCKPIT

Guidance in business management.

Interpersonal relations.

Leadership Styles.

Right and wrong actions. (Right Stuff)

The "Non-assertive" co-pilot

## 2. CREW

Chain of errors and causality of accidents.

Concepts of Stress Management and Situational Awareness.

Group knowledge (Decision making, Briefing, etc.)

## 3. Systemic CRM

COMPANY

Integration with Dispatchers, TCP, Maintenance, ATC, etc...

CRM training instructor.

LOFT

## 4. ADVANCED CRM

CRM involved in lists of procedures, specialized topics (automation)  
Cameras in Simulators.

## 5. Threat & Error Manag.

COMPLETE  
TEM/SMS

Human Error Management, Mitigation, Warnings

???



CRM

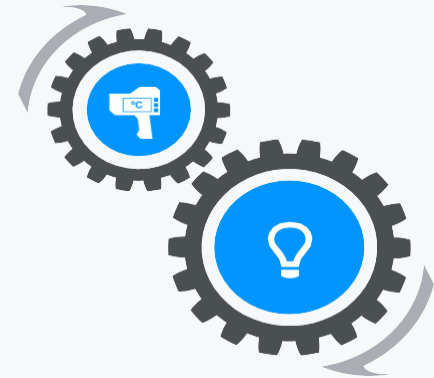


# WHAT IS CRM?

*“It is the family of instructional strategies, with which it seeks to improve work teams by applying training tools already tested and aimed at specific contents” – SALAS*

*“Training in behaviors to recognize security threats, avoid and manage mistakes made.”– HELMERICH*

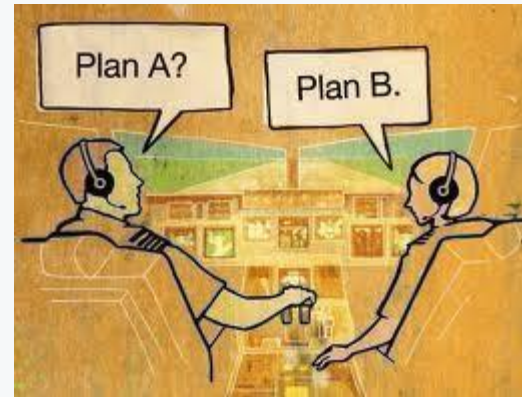
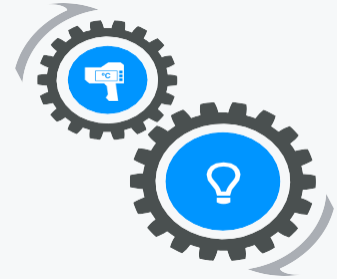
*“CRM management is the effective use of all available resources, i.e. equipment, procedures and people, in order to achieve safe and efficient flight operations.” ICAO*



# WHAT IS CRM?

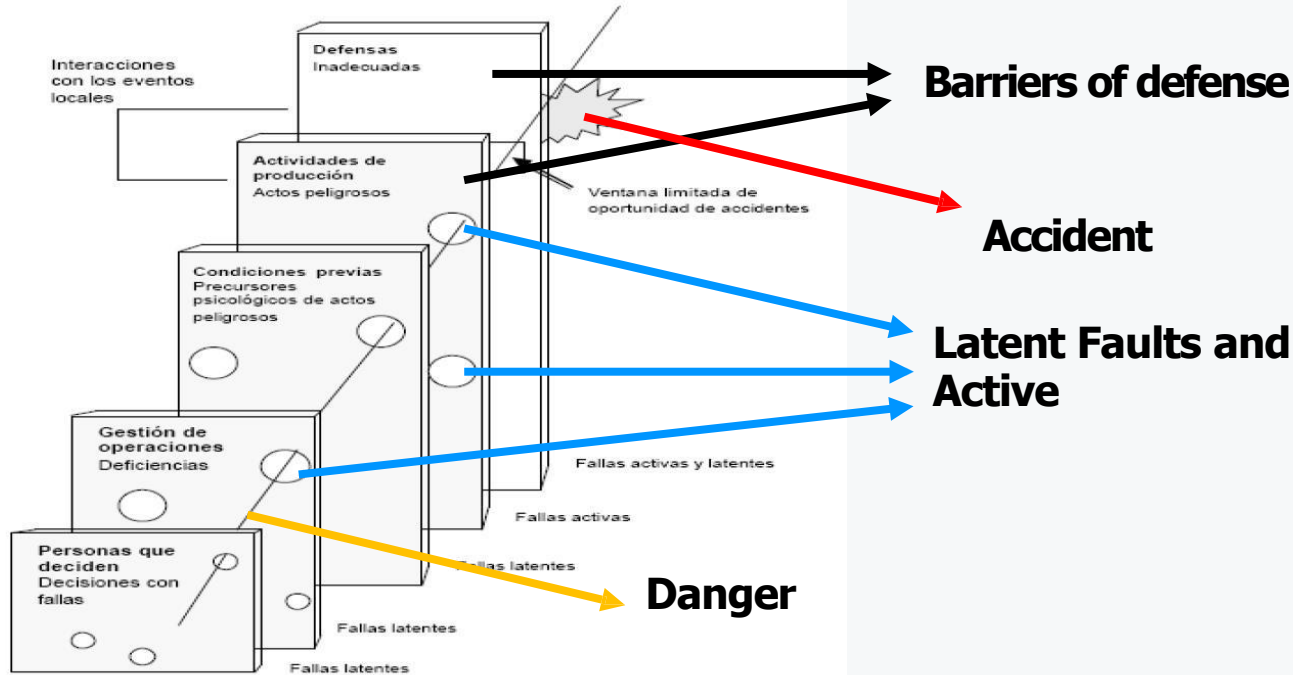
## WHAT DOES CRM CONSIST OF?

- **Complete system to improve crew performance.**
- **It takes care of the entire crew.**
- **System that can be expanded to cover all forms of aeronautical crew training. (including drone operators)**
- **It focuses on the attitudes and behavior of the members of the crew, as well as its repercussions on safety.**
- **It provides an opportunity for people to examine their behaviour and make individual decisions to improve teamwork in the cockpit.**

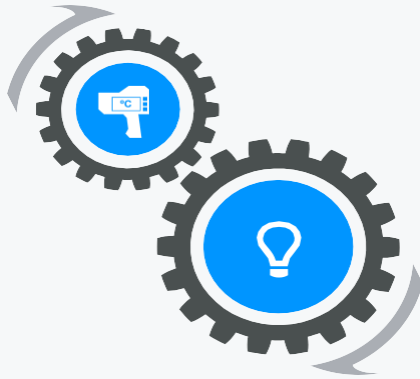


# JAMES REASON'S MODEL MODEL

*"In flight, "loyalty to the rules" should trump other loyalties that might be prioritized on the ground." H. Leimann Patt*



# CRM SPHERES

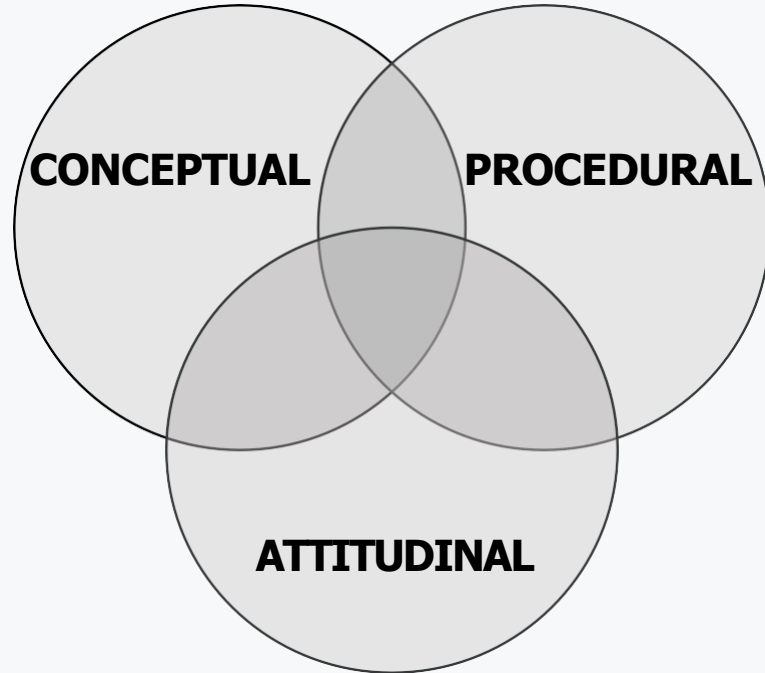


	<b>Communications</b> <ul style="list-style-type: none"><li>• Cultural influence</li><li>• Role (age, crew position, etc.)</li><li>• Assertiveness</li><li>• Participation</li><li>• Listening</li><li>• Feedback</li></ul>	
<b>Situational Awareness</b> <ul style="list-style-type: none"><li>• Total awareness of surrounding environment</li><li>• Reality versus perception of reality</li><li>• Fixation</li><li>• Monitoring</li><li>• Incapacitation (partial/total, physical/psychological)</li></ul>	<b>Problem Solving/ Decision Making/ Judgment</b> <ul style="list-style-type: none"><li>• Conflict resolution</li><li>• Review (time-constrained)</li></ul>	<b>Leadership/ Followership</b> <ul style="list-style-type: none"><li>• Team building</li><li>• Managerial and supervisory skills</li><li>• Authority</li><li>• Assertiveness</li><li>• Barriers</li><li>• Cultural influence</li><li>• Roles</li><li>• Professionalism</li><li>• Credibility</li><li>• Team responsibility</li></ul>
<b>Stress Management</b> <ul style="list-style-type: none"><li>• Fitness to fly</li><li>• Fatigue</li><li>• Mental state</li></ul>	<b>Critique (three basic types)</b> <ul style="list-style-type: none"><li>• Preflight analysis and planning</li><li>• Ongoing review</li><li>• Post-flight</li></ul>	<b>Interpersonal Skills</b> <ul style="list-style-type: none"><li>• Listening</li><li>• Conflict resolution</li><li>• Mediating</li></ul>

# CRM SPHERES

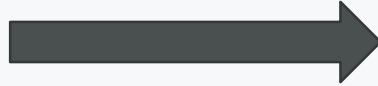
THE **CRM** IN INSTRUCTION  
REFERS TO:

**KNOWLEDGE**  
**SKILLS**  
**ATTITUDES**



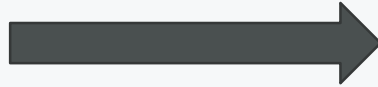
# CRM SPHERES

**KNOWLEDGE??**



**CONCEPTUAL**

**SKILLS??**



**NON-TECHNICAL  
SKILLS**



**BEHAVIOUR**



# CRM SPHERES

**SITUATIONAL  
AWARENESS**

**WHERE AND HOW AM I?**

**WHAT DO I WANT TO  
DO?**

**WHAT'S GOING  
ON AROUND ME?**



# CRM SPHERES

## DECISION- MAKING

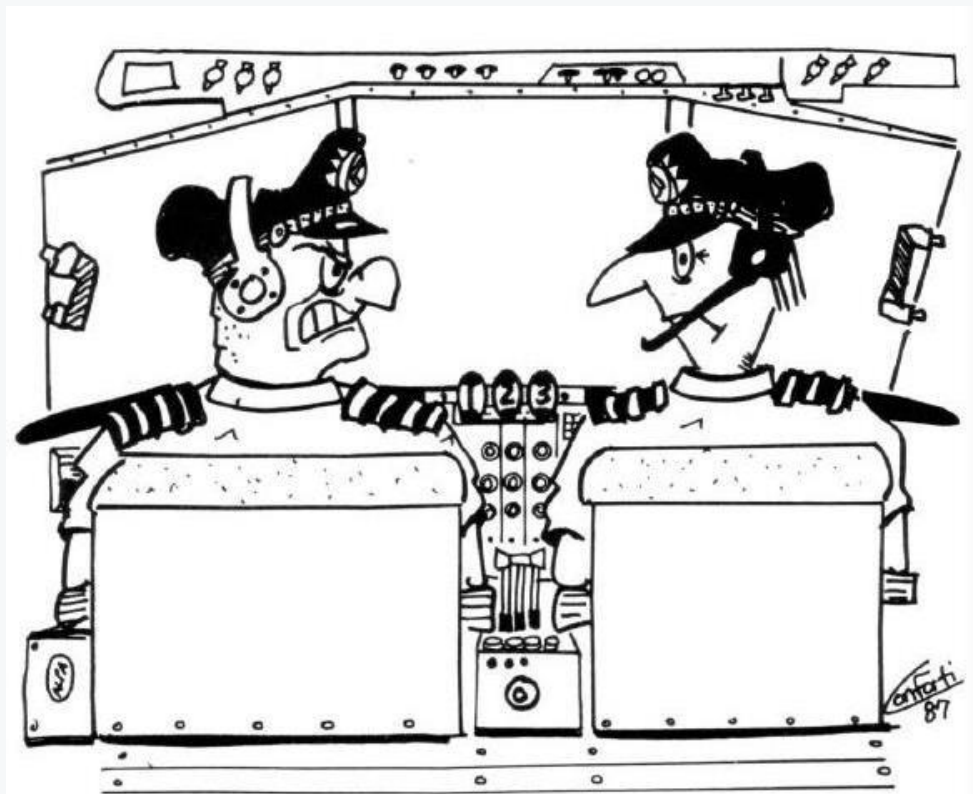
### CHECKLIST BINOMIAL

1. DO NOT TOUCH  
ANYTHING
2. KEEP YOUR MOUTH  
SHUT



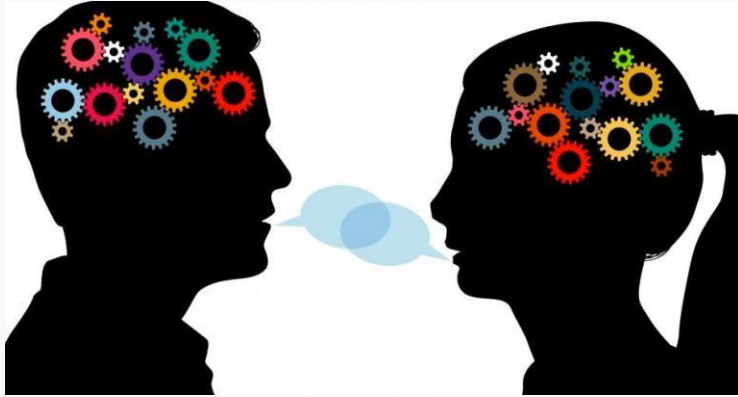
# CRM SPHERES

## LEADERSHIP



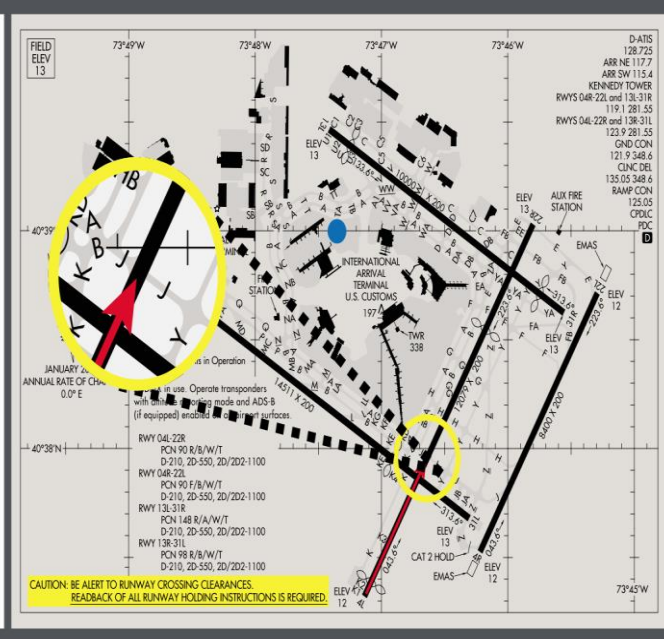
# CRM SPHERES

## COMMUNICATION



*“Communicating is what we do most often but it is not what we do best”* **Leimann Patt**

With reference to the airport diagram for John F. Kennedy International Airport (JFK) at right, AAL106 began taxiing for departure at taxiway Tango Alpha, marked by the blue dot just above center of the diagram. Flight 106 was cleared to taxi to Runway 4L via taxiway Bravo and to hold short of Kilo. This confluence of taxiways is within the yellow circle on the diagram at right. Subsequently, AAL106 was cleared to cross Runway 31L at Kilo, a right turn. Instead, it apparently jogged left, then right, crossing Runway 4L on taxiway Juliet. The red arrow represents DAL1943's takeoff roll.



# CRM SPHERES

FOR WHAT?

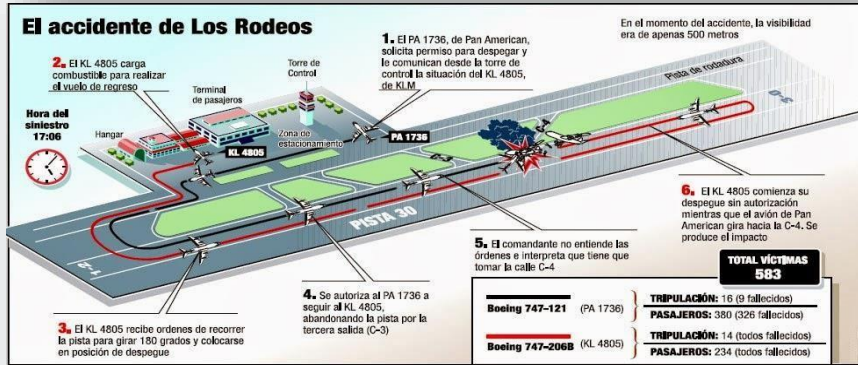
MANAGE  
ERRORS

PREVENT  
VIOLATIONS



# ACCIDENT IN TENERIFE-(Worst accident in aviation history)

- 27 - Mar - 1977 Canary Islands, Spain.
- 2 Boeing B-747 (KLM and PAN AM).
- 583 people died, 61 survivors.
- During the take-off of the KLM and the filming of the PAN AM.
- Poor visibility, errors in communications.
- Las Palmas Airport, closed due to threat,
- Los Rodeos not prepared for the large flow of aircraft.
- Long delays of all aircraft.



# CONCLUSION

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**THANK YOU VERY MUCH  
FOR YOUR ATTENTION!!**