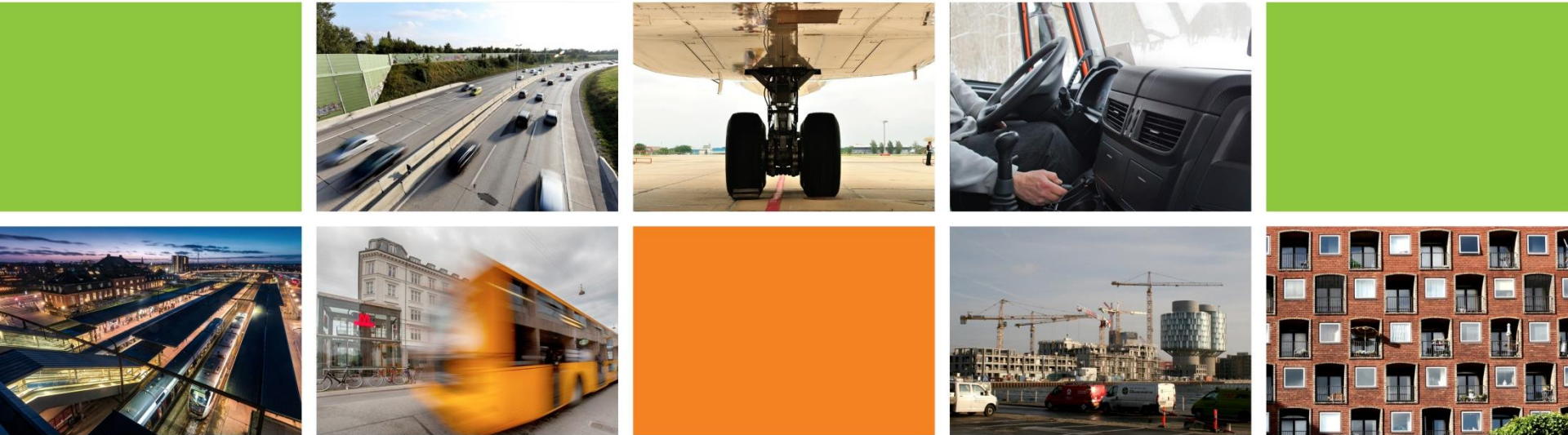# Examiner seminar 2019-2022

Roskilde Airport DEC 2021

Agenda

- Introduction (safety briefing)

- Reference documents, Performance Triangle, single pilot CRM

- HF/CRM scenario-based development

- Competency based assessment

- Pilot Monitoring Role – the "MADI" model

- UPRT & undesired aircraft state(s)

- Facilitated de-briefings

- Summary

Examiner reference documents

Where do we find the testforms?

TMG and SINGLE-PILOT AEROPLANE (Non-HPCA)		
SKILL TEST ☐		PROFICIENCY CHECK ☐

MULTI-PILOT AEROPLANE or HPCA

Application and report form

☐ SKILL TEST ATPL(A)	☐ SKILL TEST TYPE RATING	☐ PROFICIENCY CHECK
License Endorsement:		☐ PIC ☐ CO-PILOT

ATPL and other tests flown as PIC, require the applicant to occupy LH seat

SINGLE/MULTI-PILOT HELICOPTER

☐ SKILL TEST ATPL(H)	☐ SKILL TEST TYPE RATING(H)	☐ PROFICIENCY CHECK(H)
License Endorsement:	☐ PIC	CO-PILOT IR(H) ME: ☐ YES ☐ NO
IR(H): YES ☐ NO ☐	☐ SP OPS ☐ MP OPS	

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- Documents
- Testforms

Where do we find the CRM reference document?

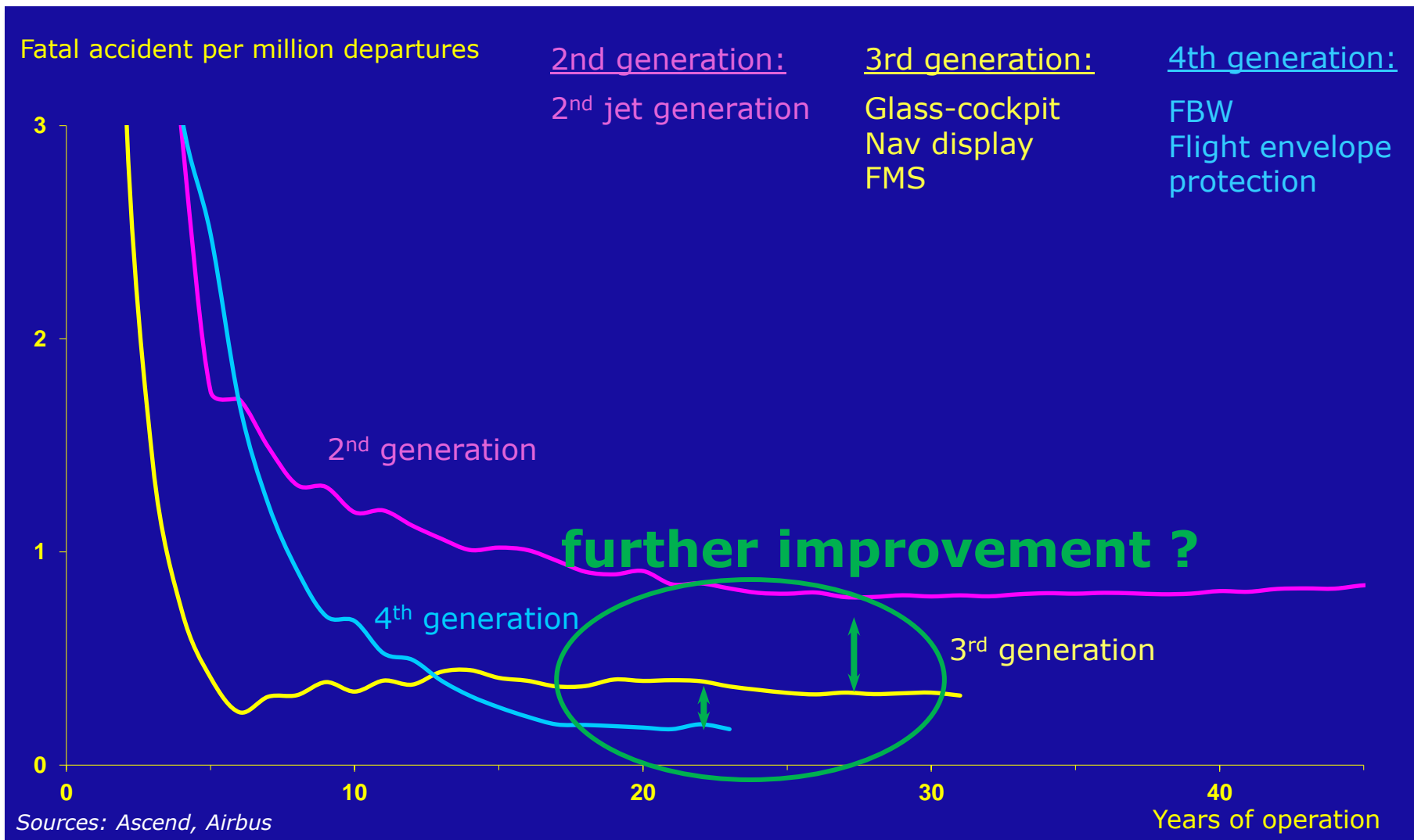Flight-crew human factors handbook
CAP 737

Competence based assesment

We fly as we train – and we train as we fly!

A Line Oriented Evaluation (LOE) during a flight from EKCH to EDDF – would you expect to observe a "huge" difference in "required human performance" in these 2 cockpits?

Competence based assesment

Fatal accident per million departures

2nd generation:
2nd jet generation

3rd generation:
Glass-cockpit
Nav display
FMS

4th generation:
FBW
Flight envelope
protection

2nd generation

further improvement ?

4th generation

3rd generation

Sources: Ascend, Airbus

Years of operation

Pilot core competencies (nine)

Pilot Core Compenties
Communication (COM)
❌ Leadership & Teamwork (LTW)
❌ Situation Awareness (SAW)
❌ Problem solving & Decision Making (PSD)
❌ Workload Management (WLM)
Knowledge (KNO)
Application of Regulations and Procedures (APK)
Flight Path Management – Automation (FPA)
Flight Path Management – Manual control (FPM)

❌ NOTECH categories

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CRM assessment - NOTECH

Categories

Co-operation

Leadership and managerial skills

Situation awareness

Decision making

Elements

- Team-building and maintaining
- Considering others
- Supporting others
- Conflict solving

- Use of authority and assertiveness
- Providing and maintaining standards
- Planning and co-ordinaion
- Workload management

- Awareness of time/energy
- Awareness of aircraft systems
- Awareness of external environment

- Problem definition and diagnosis
- Option generation
- Risk assesment and option selection
- Outcome review

7

Behavioral markers

Element: Use of authority and assertiveness:

Good practice:

- Takes initiative to ensure crew involvement and task completion
- Takes command if situation requires, advocates own position
- Reflects on suggestions of others
- Motivates crew by appreciation and coaches when necessary

Poor practice:

- Hinder or withholds crew involment
- Passive, does not show initiative for decisions, own position not recognisable
- Ignores suggestions of others
- Does not show appreciation for the crew, coaches very little or too much

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Core competencies - communication

The **core competencies** listed in ICAO Doc 9995 serve as an example. Industry practice and experience indicate that behavioral indicators related to 'knowledge' (not defined in Doc 9995) are very useful and may be included as an additional **core competency.** Competencies can be added by any organization.

| Competency	Description	Behavioural indicators
Knowledge	Demonstrates knowledge and understanding of relevant information, operating instructions, aircraft systems and the operating environment	— Demonstrates practical and applicable knowledge of limitations and systems and their interaction — Demonstrates required knowledge of published operating instructions — Demonstrates knowledge of the physical environment, the air traffic environment including routings, weather, airports and the operational infrastructure — Demonstrates appropriate knowledge of applicable legislation — Knows where to source required information — Demonstrates a positive interest in acquiring knowledge — Is able to apply knowledge effectively

Communication – grading (example)

5	The pilot communicated in an exemplary manner, by always demonstrating all of the behavioral indicators when required, which significantly enhanced safety, effectiveness and efficiency.
4	The pilot communicated effectively, by regularly demonstrating all of the behavioral indicators when required, which enhanced safety.
3	The pilot communicated adequately, by regularly demonstrating most of the behavioral indicators when required, which resulted in a safe operation.
2	The pilot communicated at the minimum acceptable level, by only occasionally demonstrating some of the behavioral indicators when required, but which overall did not result in an unsafe situation. Note: Minimum acceptable level
1	The pilot did not communicate effectively, by rarely demonstrating any of the behavioral indicators when required, which resulted in an unsafe situation.

Single pilot CRM

Competency topic	
Application of procedures	RNP, Transitions
Communication	ATC, company
Flight Path Management Automation	Advanced automation
Flight Path Management Manual	Lack of proficiency
Application of knowledge	Gab between required and observable
Leadership and teamwork	Team ressource management
Problem-solving and decision-making	Lack of training
Situation awareness	Lack of proficiency
Workload management	Lack of tools & training

# MADI...... *"new generation"*
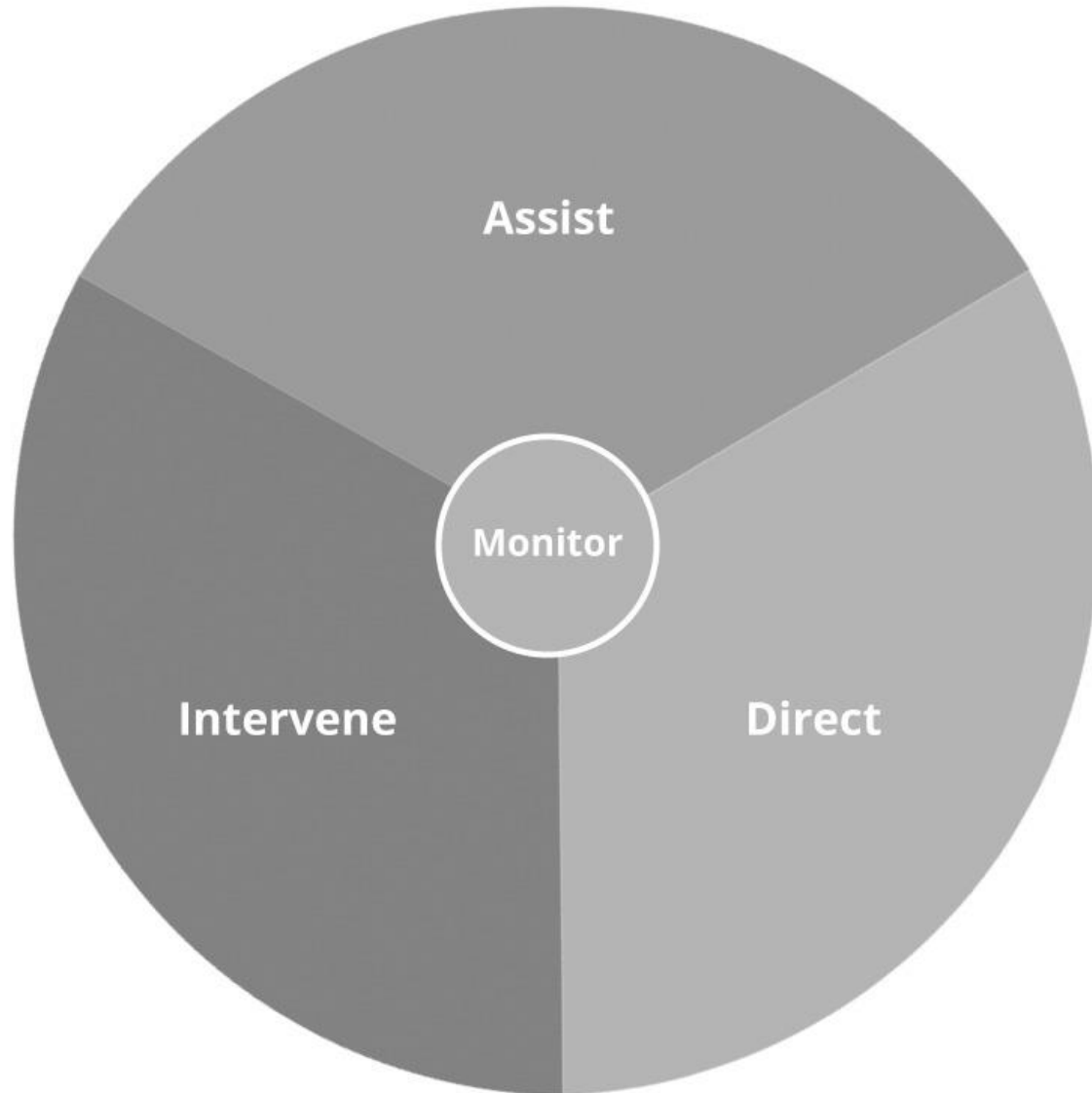
HF and CRM – Scenario-based development

Training in resilience development - an element of CRM, has been required by EASA air operations regulations since 2016.

Resilience development in Crew Resource Management (CRM) training should cover mental flexibility and performance adaptation, according to EASA air operations regulations (ORO.FC.115).

Flight crews are required to be trained to understand that *mental flexibility* is necessary to recognize critical changes, to reflect on their judgement and adjust it to the unique situation, to avoid fixed prejudices and over-reliance on standard solutions, and to remain open to changing situations and perceptions.
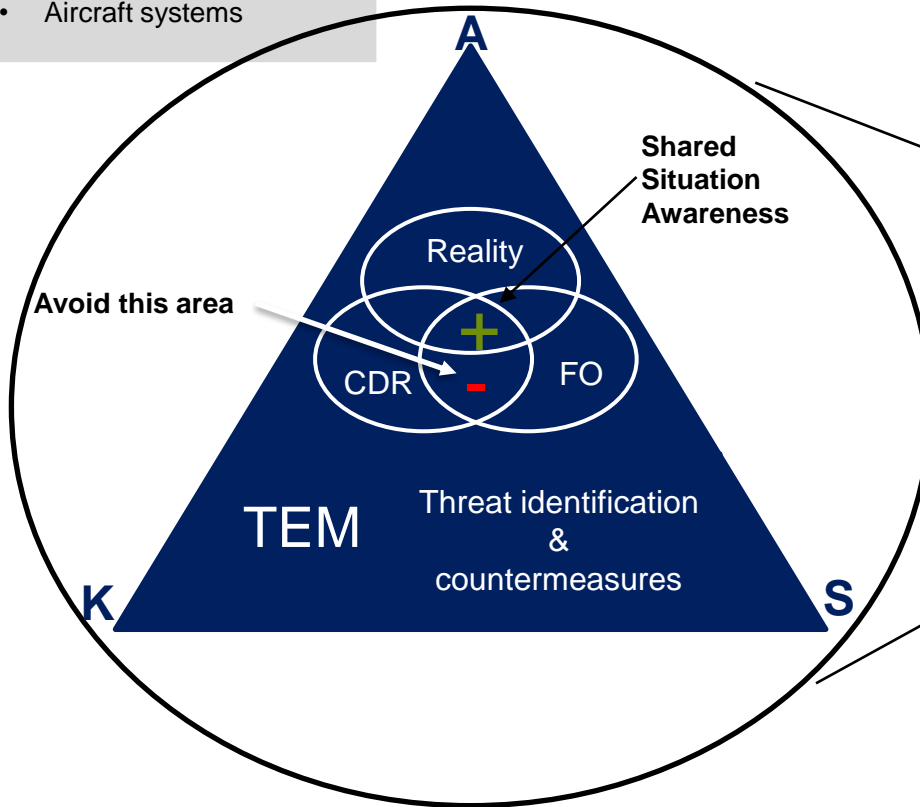
In regard to *performance adaptation,* flight crews should be trained to mitigate frozen behaviors, overreactions and inappropriate hesitation, and to adjust actions to current conditions.
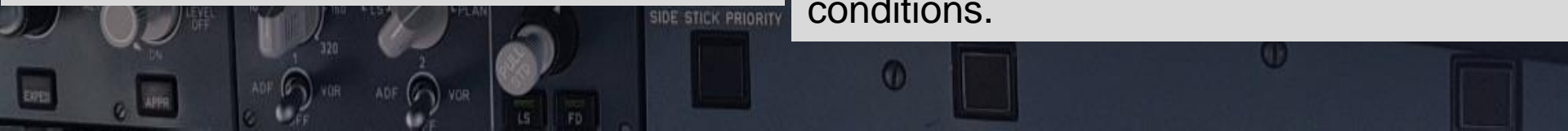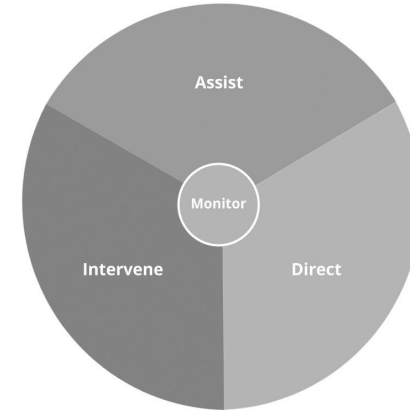
The Team Performance Model

MADI

Situation Awareness (SA)
- Time / energy
- Operational environment
- Aircraft systems

Shared Situation Awareness

Reality

Avoid this area

CDR   FO

TEM   Threat identification & countermeasures

A

K   S

Is the situation time critical or not?

Decision Making (DM) (re-evaluate)

NITSA
- Nature
- Intension
- Time
- Specials
- Announcement

T - DODAR
- Time
- Diagnose
- Options
- Decide
- Act
- Review
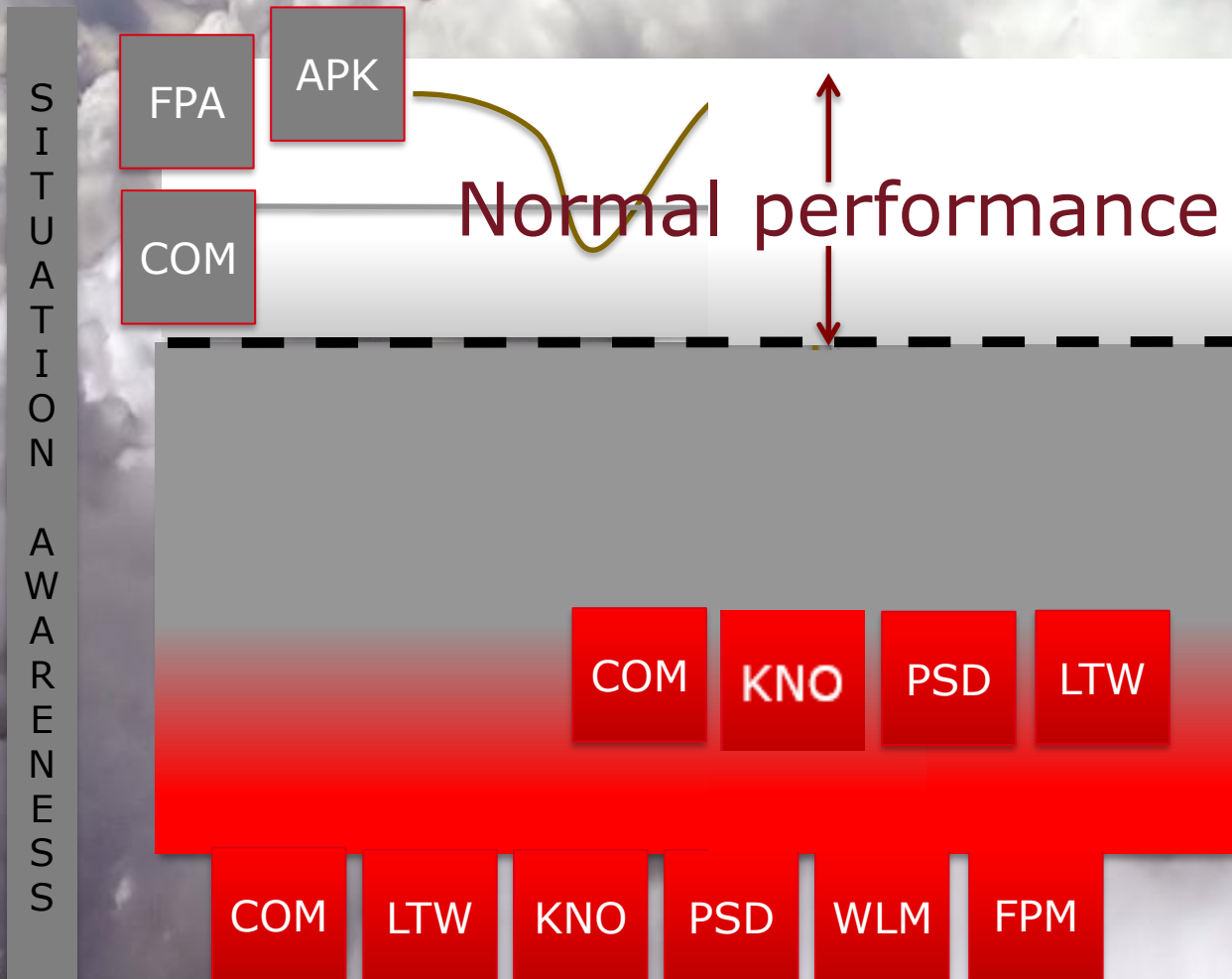
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Resilience development?

EASA definition:

Resilience is the ability of a system (FD crew) to adjust its functioning prior to, during, or following changes and distrubances, so that it can sustain required operations under expected and unexpected conditions.

Resilience is that ineffable quality that allows some people to be knocked down by life and come back stronger than ever. Rather than letting failure overcome them and drain their resolve, they find a way to rise from the ashes.

Psychologists have identified some of the factors that make someone resilient, among them a positive attitude, optimism, the ability to regulate emotions, and the ability to *see failure as a form of helpful feedback.* Even after misfortune, resilient people are blessed with such an outlook that they are able to change course and continue their work.

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Resilience

SITUATION AWARENESS

FPA

APK

COM

Normal performance

COM KNO PSD LTW

COM LTW KNO PSD WLM FPM

Pilot Core Compenties
(COM) Communication
(LTW) Leadership & Teamwork
(SAW) Situation Awareness
(PSD) Problem solving & Decision Making
(WLM) Workload Management
(KNO) Knowledge
(APK) Application of Regulations and Procedures
(FPA) Flight Path Management – Automation
(FPM) Flight Path Management – Manual

HF and CRM – Scenario-based development

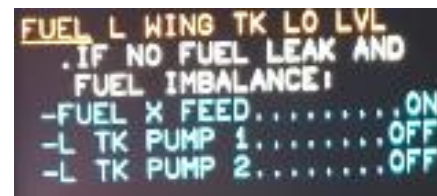..... as an examiner you are responsible for a relevant and realistic examination environment!

How do we fulfill this requirement?

Scenario-based development (EDDH – EKCH)

.... *one way to do it!*

- A "dilemma-based scenario" in a realistic winter environment will make the LOE less predictable!

- 3 different scenarios (north west, north east and south west) containing several factors that will influence and challenge the crew while building Situation Awareness (TEM) and during the "Decision Making process". As examiner you must provide all weather data before the session/flight (and decide which scenario to use before commencing the test)

- All scenarios will provide a "dilemma based" reality for the crew (weather versus a/c landing capability, NOTAMS, snow clearance, RWY change, bomb threat, single RWY alternates with "blocked"/closed RWY etc.)

- Fuel - 300 kg of fuel added to the minimum required for the flight

- Fuel leak when passing FL 180 (climbing)

- EDDH is not available for return

HF and CRM – Scenario-based development

Distances to some relevant airports from the approximately position when passing FL180 (climbing) – at this level the technical failure will be introduced:

AD	Distance/bearing
EDDH	35 NM 223 degrees
EDDW	90 NM 227 degrees
EKCH	117 NM 032 degrees
EKBI	115 NM 331 degrees

EKSP or EKOD is also available (if the crew/examiner decide to use it) – airports/approaches are available in the FMGC.

Note: EKSP is a military airport (knowledge).

Pitch attitude greater than 25 ° nose...

...e more than 10 ° nose down

Bank angle in excess of 45 °

Flight within these parameters but at airspeeds inappropriate for the phase of flight or conditions.

**Any time airplane deviates from the intended airplane state**

HF/CRM – Undesired aircraft state

Undesired aircraft states are flight crew-induced aircraft position or speed deviations, misapplication of flight controls, or incorrect systems configuration associated with a reduction in margins of safety.

Undesired aircraft states that result from ineffective Threat and Error Management may lead to compromising situations and reduces margins of safety in flight operations.

Threat and Error Management (TEM) – One way to avoid!
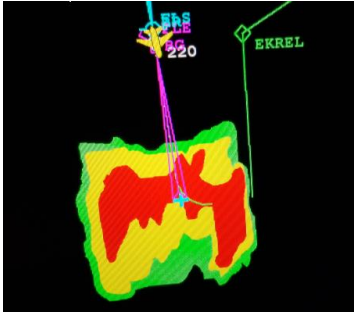
Threat and Error Management for flight crew is the practice of thinking ahead in order to predict and avoid errors and operational threats and manage any that occur.

A superior pilot uses his superior judgement to avoid situations that would require his superior skills!
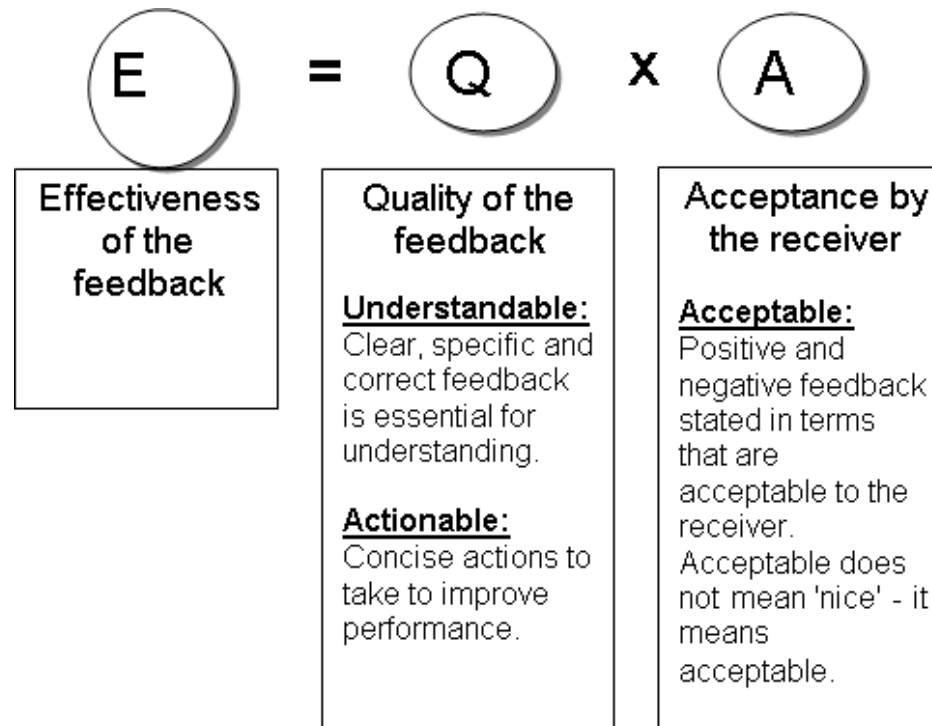
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Facilitated de-briefings

Group exercise:

What is the objective of the debrief?

Facilitated de-briefings - Effectiveness

$$E = Q \times A$$

Effectiveness of the feedback	Quality of the feedback	Acceptance by the receiver
	Understandable: Clear, specific and correct feedback is essential for understanding.	**Acceptable:** Positive and negative feedback stated in terms that are acceptable to the receiver. Acceptable does not mean 'nice' - it means acceptable.
	Actionable: Concise actions to take to improve performance.	

Facilitated de-briefings - Crew interaction chart

Interaction 20%
No Interaction 80%
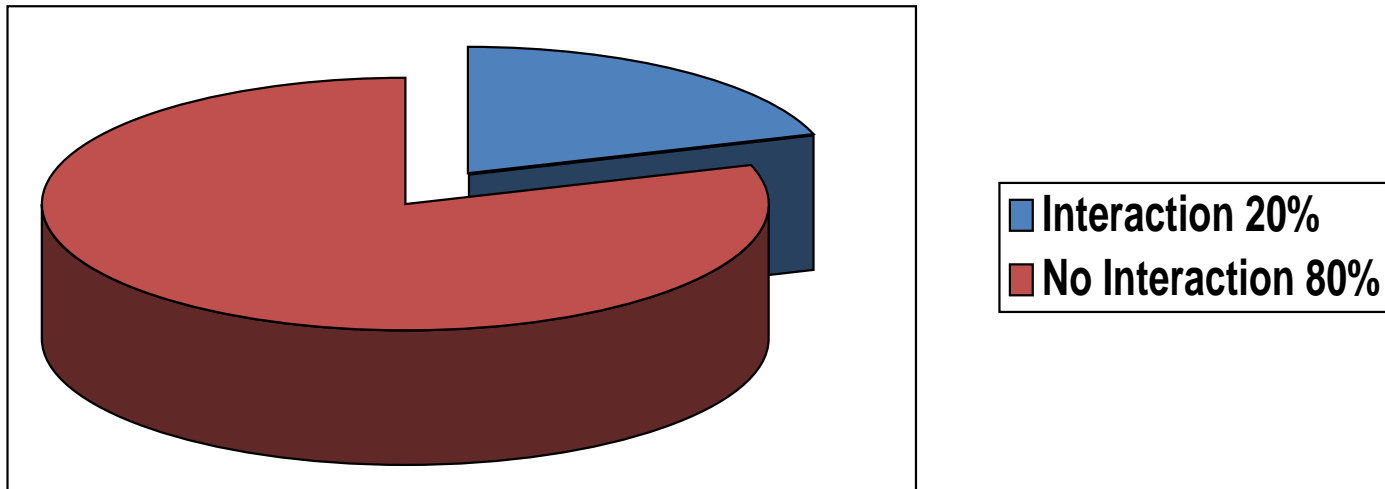
Facilitated de-briefings - Word spoken

Legend:
- Instructor
- Captain
- F/O

18%
21%
61%
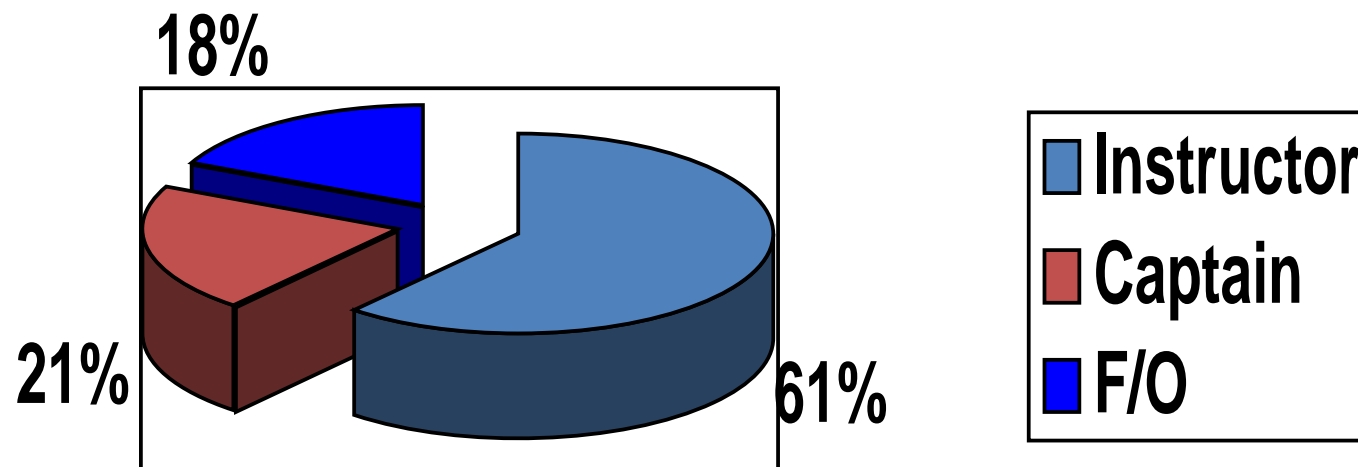
Facilitated de-briefings

How can you start a facilitated de-briefing ….. opening questions?

- "What parts of the flight do you feel are most important to discuss?"
- "What went well (or not so well)?"
- "What lessons can be learned from the flight?"
- "Is there anything you would do differently"?

Facilitated de-briefings

High-level facilitation

- Crew who can analyse and evaluate their own performance well! Minimal guidance from the Instructor is required

- Role as Instructor:

    - Inform crew about the objectives for the debriefing
    - Outline the debriefing process
    - Should only assist in guiding the discussion when it is required

Facilitated de-briefings

Intermediate-level facilitation

- Crew who are not able to conduct their own analysis and evaluation will need more involvement from the instructor

- Role as Instructor:

    - Help the crew to discover/realize important issues and lessons learned by asking "open leading questions"
    - Encourage the crew to analyse the situation and performance in greater details
    - Allow crew to complete their own analysis, however offer additional feedback (if appropiate)

Facilitated de-briefings

Low-level facilitation

- Crew show little initiative and respond only "with a few words"
  when asked to analyse and evaluate their own performance

- Your role as Instructor:

  - Use facilitation techniques to lead the crew to positive/critical issues,
    appropiate solutions and correct evaluation
  - You may have to summarize the nature of the problems
    encountered and describe how it should be handled
  - Continue to "take" crew participation and involment
    to a higher level

Facilitated de-briefings

	Instructing	Facilitating
What do the words mean?	Telling and showing	They figure it out
What is the aim?	Developing knowledge and skills	Changing attitudes, developing awareness
Who knows the subject?	Trainer	Both
Who has the experience?	Trainer	Both
How do you know If the trainee has learnt?	Test	Observation
What is your attitude towards the trainee's responses?	Judgemental	Non judgemental
Who talks the most?	Trainer	Trainee
How long does it take?	Finite	Indefinite
How much preparation?	A lot	Little
How high is the trainer's workload during the session?	High to medium	Intense
Who sets the agenda?	Trainer	Both
Where typically is the focus?	Trainer and tasks	Trainee

What did you get to take home?

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