

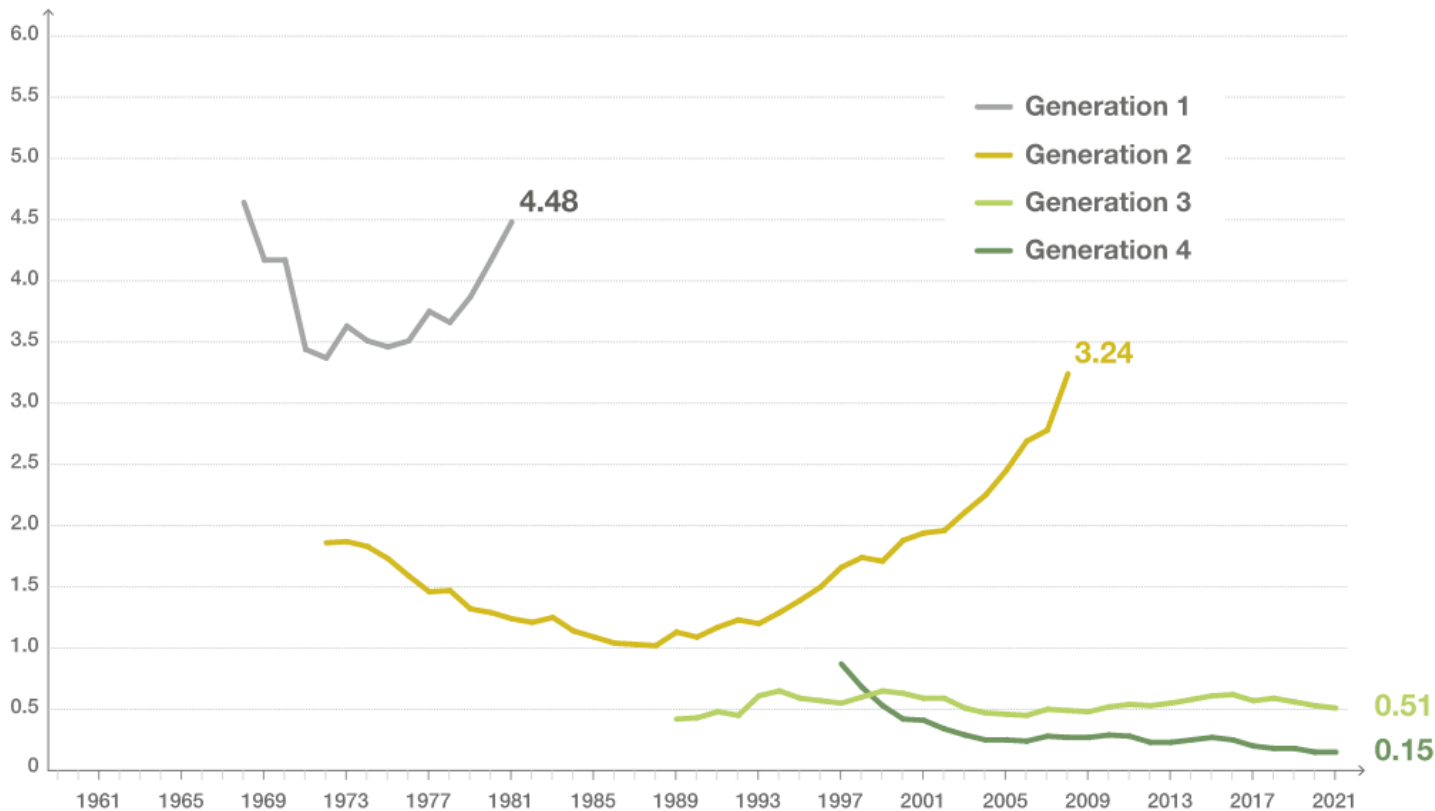
Examiner seminar 2023-2025

Examiner Seminar 2023 - 2025



- Introduction
- State of the industry
- Examiner reference documentation
- The past 9 years / 3 cycles
- Setting the environment
- TEM and other “reference models”
- The Performance Triangle & “the 9 competencies”
- CBTA - Dilemma based examination scenario(s)
- A Facilitated Approach to checking/training
- Groupwork
- Questions?

Fourth-generation aircraft have the lowest hull loss rate



Evolution of commercial jet aircraft



Early Commercial Jets From 1952

Dials and gauges in cockpit, early autoflight systems

Comet, Caravelle, BAC-111, Trident, VC-10, B707, B720, DC-8, Convair 880/990



More Integrated Autoflight From 1964

More elaborate autopilot and autothrottle systems

Concorde, A300, Mercure, F28, BAe146, VFW 614, B727, B737-100/-200, B747-100/-200/-300/SP, L-1011, DC-9, DC-10



Glass Cockpit, FMS & TAWS From 1980

Electronic displays, Flight Management System (FMS), and Terrain Awareness and Warning System (TAWS) reduced CFIT accidents

A300-600, A310, Avro RJ, F70, F100, B717, B737 Classic, B737 NG, B737 MAX, B757, B767, B747-400/-8, Bombardier CRJ, Embraer ERJ, MD-11, MD-80, MD-90

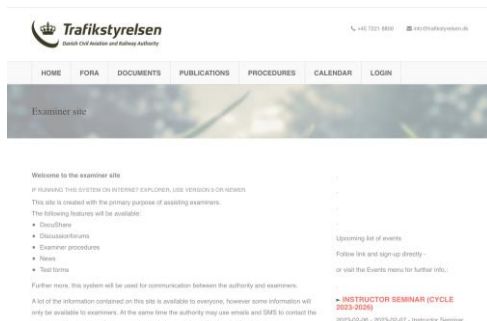


Fly-By-Wire From 1988

Flight envelope protection enabled by fly-by-wire technology reduced LOC-I accidents

A220, A318/A319/A320/A321, A330, A340, A350, A380, B777, B787, Comac C919, Embraer E-Jets, Sukhoi Superjet

Examiner reference documentation / sources



Flight-crew human factors handbook
CAP 737



European Union Aviation Safety Agency

Examiner Differences Document

Examiner Differences Document

to FCL.1015(b)(4) and (c) of Annex I (Part-FCL) of Commission Regulation (EU) No 1178/2011, as amended. This document has been developed in accordance with ARA.FCL.210 of Annex VI (Part-ARA) to Commission Regulation (EU) No 1178/2011, as amended.

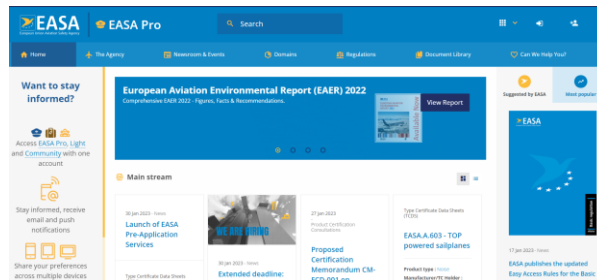
Version 2023/Q1
Year 2023
Date: 10.01.2023



Dansk Plan for Aviation Safety 2023 - 2027

DKPAS 2023 - 2027

Danish Plan for Aviation Safety 2023 - 2027



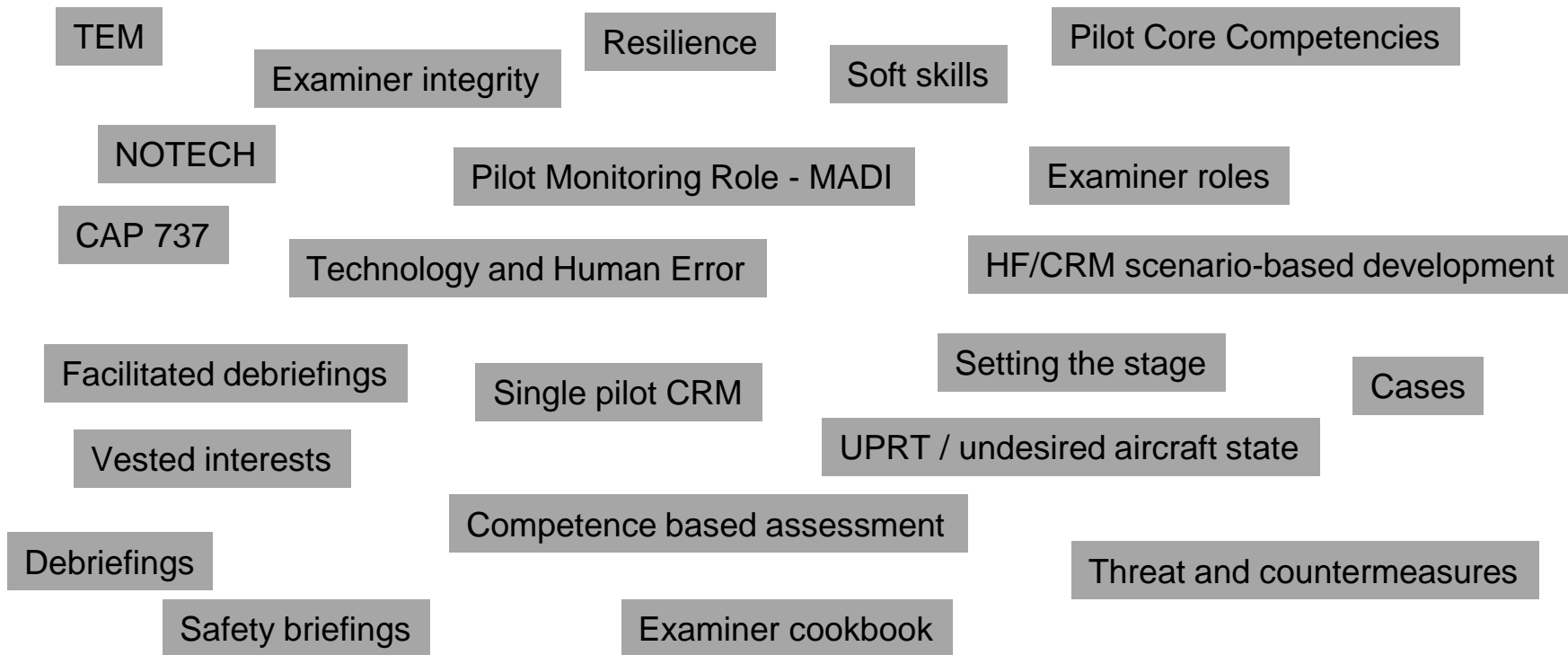
CAP 737 – Content headlines

- Information processing
- Perception
- Attention
- Vigilance & monitoring
- Human error, Skills, Reliability and Error management
- Workload
- Surprise & startle
- Situational Awareness
- Decision Making
- Stress in aviation
- Sleep and fatigue
- Personality & cultural differences
- Effects of groups & teams (coordination, teamwork, group decisions)
- Leadership
- Communications
 - Communication
 - Language
 - Sharing mental models
 - Assertiveness
 - Verbal interventions
- Automation Human Factors (HF)
- Working with external teams

Note: This list of CAP 737 chapters and content is not complete

The past 9 years / 3 cycles - Human Factors and CRM

What do you remember from the previous 9 years?



Setting the environment (FEM module 1 – general)

Setting the Environment

11.0 CONDUCT OF THE TEST

11.1 Examiner Behaviour:

The Examiner **should encourage** a friendly and relaxed atmosphere to develop both before and during a test to enable the candidate to fully demonstrate their abilities. A negative or hostile approach should not be used. During the test, the examiner should avoid negative body language, comments or criticisms and all assessments should be reserved for the debriefing.

The performance of a Candidate under test conditions will often be adversely affected by some degree of nervous tension, but the Examiner can do much to redress the balance in their favour by the adoption of a friendly and sympathetic attitude. Any suggestion of haste during briefing should be avoided and the Candidate should be encouraged to ask as many questions as they wish at the conclusion of each section. Clear and unhurried instructions at this stage will not only serve to put the Candidate at his ease but will ensure the test proceeds smoothly and without unnecessary delay.

Examiners are responsible for improving all training and flight instruction in ATOs/DTOs by feeding back information on items or sections of tests that are most frequently repeated or failed. They must also assist in maintaining and, where possible, improving air safety standards by displaying good airmanship and flight discipline during tests. An Examiner should not re-examine a failed candidate without the agreement of the candidate.

Setting the environment

How should we “set the environment”?



Crew Resource Management (CRM)

Crew Resource Management (CRM) is the effective use of all available resources for flight crew personnel to assure a safe and efficient operation, reducing error, avoiding stress and increasing efficiency.

What is “good” CRM?

TEM from the perspective of flight crew (FEM)

Threats

Errors

Undesired Aircraft States

4.2 Threat and Error Management (TEM)

In addition to the skills and knowledge required for a particular grade of pilot licence, it is equally important that the Examiner pays attention to the 'soft skills' required to make good decisions while piloting an aircraft.

All flight and ground instruction for EASA licences include the principles of Threat and Error Management (TEM). The Aircrew regulation gives clear guidance on the principles of Threat and Error management for the Multi-Pilot Licence (MPL); however, the regulation does not go into detail for other licences. Examiners conducting skill tests for the first issue of a licence should check that the Candidate clearly understands and is familiar with these principles at the level appropriate for the grade of licence sought.

Regardless of the grade of licence being examined, all Examiners should be familiar with the principles of Threat and Error Management (TEM) and be able to discuss the TEM framework with ATO/DTO instructors as well as test candidates.

The Aircrew Regulation sets out one model that explains the principles of Threat and Error management, simply referred to as the "the TEM model".

According to this model, three basic components of TEM from the perspective of flight crews are:

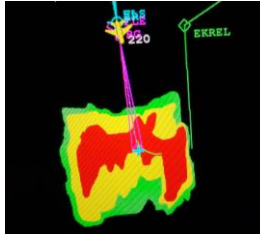
- Threats,
- Errors, and,
- Undesired Aircraft States.

Threat and Error Management (TEM)

Threats

Errors

Undesired Aircraft States



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.

Examiners need to be cautious to strike the right balance of knowledge and application required for the licence sought i.e. the level of TEM application for the LAPL will not be the same as for the CPL or the ATPL. Where a Candidate has a lack of knowledge or is weak in the application of TEM principles, Examiners will need to use sound judgement when deciding how to proceed. For instance, a LAPL or PPL candidate may be unfamiliar with the TEM terminology but may still exhibit sound decision-making skills in the pre-flight and the flight. In this case, the Examiner can simply ensure that the Candidate is made familiar with the TEM principles in the flight debrief and may also consider briefing the HT/CFI of the ATO/DTO ensure that future candidates are better prepared.

HF/CRM undesired aircraft states

Threats

Errors

Undesired Aircraft States

Any time airplane deviates from the intended airplane 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.



Knowledge – Skills – Attitude (FEM)

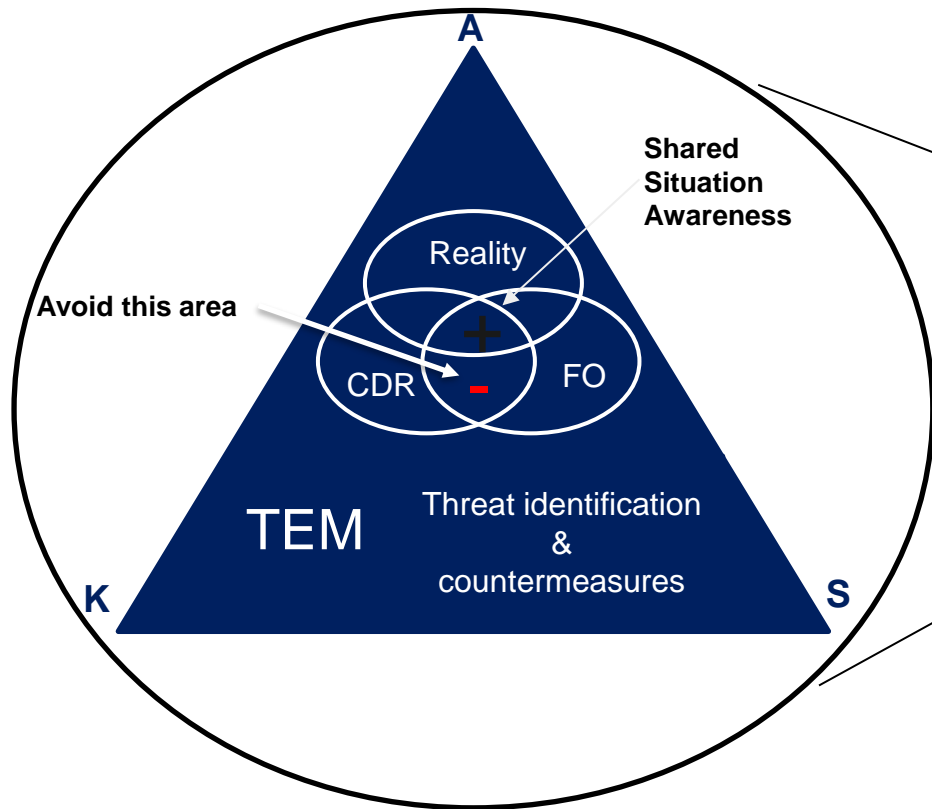
Module 1 - General

KNOWLEDGE	This cell describes the desirable knowledge of the Candidate when applying the skills and attitudes necessary to comply with rules, principles and to solve problems. Knowledge is specific information required to enable a learner to develop and apply the skills and attitudes to recall facts, identify concepts, apply rules or principles, solve problems, and think creatively in the context of work ^{VI} .
SKILL	This cell describes the desirable skill required by a Candidates to perform the test item. Skill is the ability to perform an activity or action. It may be divided into three skill types: motor, cognitive and metacognitive skills.
ATTITUDE	This cell describes the attitude required by a Candidates to perform the test item. Attitude is a persistent internal mental state or disposition that influences an individual's choice of personal action toward some object, person or event and that can be learned. Attitudes have affective components, cognitive aspects and behavioural consequences. To demonstrate the “right” attitude, and a learner needs to “know how to be” in a given context.
Note: The intention of this table is to provide typical, tangible assessment elements in order to evaluate the satisfactory performance of a task during a test.	

These tables are provided as guidance to assist the Examiner when assessing the requirements and the competencies required for satisfactory performance of each test item, appropriate to the licence, rating or certificate being sought. The Examiner is expected to use sound judgement when considering the overall competency of the candidate.



Team Performance – Performance Triangle

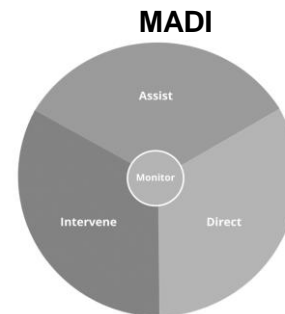


Situation Awareness (SA)

- Time / energy
- Operational environment
- Aircraft systems

Is the situation
time critical
or not?

Decision Making (DM)
(re-evaluate)



The 9 Competencies (FEM)

15.3.2 Competency Guidance

Airmanship is defined as the consistent use of good judgement and well-developed knowledge, skills and attitudes to accomplish flight objectives.

ICAO has defined Competency as a dimension of human performance that is used to reliably predict successful performance on the job. A competency is manifested and observed through behaviours that utilise the relevant knowledge, skills and attitudes to carry out activities or tasks under specified conditions.

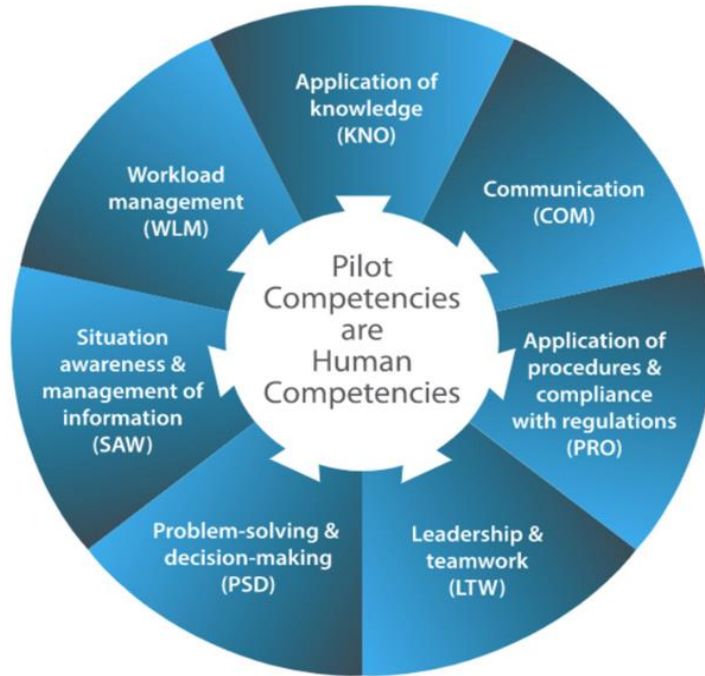
EASA, based on the ICAO recommendations, has defined a set of pilot competencies as follows:

- Application of Knowledge [KNO]
- Application of procedures and compliance with regulations [PRO]
- Aircraft Flight Path Management, Automation [FPA]
- Aircraft Flight Path Management, manual control [FPM]
- Communication [COM]
- Leadership and Teamwork [LTW]
- Problem Solving and Decision Making [PSD]
- Situation awareness and management of information [SAW]
- Workload Management [WLM]

The competencies provide individual and/or team countermeasures to threats and errors to avoid undesired aircraft states^{xii}. CRM skills are embedded in the competency.

The 9 Competencies (FEM)

The 9 core competencies



+

Flightpath Management – Manual

Flightpath Management - Automation

The 9 Competencies (FEM)

Competency	Competency description	Observable Behaviour (OB)
Application of Knowledge (KNO)	Demonstrates knowledge and understanding of relevant information, operating instructions, aircraft systems and the operating environment	<ul style="list-style-type: none">• 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

The 9 Competencies (FEM)

Communication [COM]

Communicates through appropriate means in the operational environment, in both normal and non-normal situations

- Determines that the recipient is ready and able to receive information
- Selects appropriately what, when, how and with whom to communicate
- Conveys messages clearly, accurately and concisely
- Confirms that the recipient demonstrates understanding of important information
- Listens actively and demonstrates understanding when receiving information
- Asks relevant and effective questions
- Uses appropriate escalation in communication to resolve identified deviations
- Uses and interprets non-verbal communication in a manner appropriate to the organisational and social culture
- Adheres to standard radiotelephone phraseology and procedures
- Accurately reads, interprets, constructs and responds to datalink messages in English

The 9 Competencies (FEM)

Situation awareness and management of information [SAW]

Perceives, comprehends and manages information and anticipates its effect on the operation

- Monitors and assesses the state of the aeroplane and its systems
- Monitors and assesses the aeroplane's energy state, and its anticipated flight path
- Monitors and assesses the general environment as it may affect the operation
- Validates the accuracy of information and checks for gross errors
- Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected
- Develops effective contingency plans based upon potential risks associated with threats and errors
- Responds to indications of reduced situation awareness

Competence and scenario-based development

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

How do we fulfill this requirement?

..... competence-based development vs competence based assessment of performance!



SA - how to build/create it in a crew setting

Example - before take off:

- Weather / where to land in case of a failure? What is possible/available?
- Mass/performance
- Threats?

The “**EATA** MODEL” – a model for competence-based development

- **E**nvironment (weather, mountains, RWY, obstacles etc.)
- **A**ircraft status (failures, MEL, INOP systems etc.)
- **T**ime (fuel) / Energy
- **A**dditional THREATS - “Threat radar”

Test debriefing (FEM)

16.0 Test Debriefing

The Examiner should conduct a fair, unbiased debriefing of the candidate based on identifiable factual items. The Examiner should refer to the flight test tolerances given in the relevant skill test. A balance between friendliness and firmness should be evident. The debrief must be transparent and if relevant, a school representative or the Instructor may be present.

The Examiner shall exercise sound judgement and impartiality throughout. To assist with this, each Examiner should maintain brief, factual, and unobtrusive notes of the event so that all aspects may be debriefed comprehensively.

Attention should be paid to the following points:

- Summarize the overall performance of the Candidate
- Only observed performance can be evaluated
- Comments are important and they require factual explanations
- Advise the candidate on how to avoid or correct mistakes
- Mention any other areas for development noted
- Give any advice considered helpful for the improvement of flight safety
- Allow time for questions from the Candidate



Generally, the debriefing should start with giving the Candidate the result of the test.

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Flight Examiner Manual

Module 1 - General

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Module 7.1 - AOC SFI/TRI

Section 4 - FSTD/FLIGHT Debriefing

4.1	Presentation and discussion of observations	<ul style="list-style-type: none">The Instructor applicant should demonstrate the ability to conduct a fair, unbiased debriefing of the trainee's performance based on identifiable factual items.
4.2	Progress review	<ul style="list-style-type: none">Assesses and encourages trainee self-assessment, provides clear and constructive feedback.Compares individual outcomes/performance in relation to the defined objectives.Capable of identifying individual differences in learning rates.Ability to apply corrective action/advice to trainee(s), when required.
4.3	Training evaluation	<ul style="list-style-type: none">Integrates non-technical (NONTECHS) and behavioural markers into all aspects of the observed progress.Checks for understanding and summarises learning points of the exercises covered.
4.4	Structuring and time planning	<ul style="list-style-type: none">Maintains awareness of the trainee's welfare. Ability to highlight good training performance.Clear understanding of root causes in case of underperformance or lack of progress.
4.5	Reporting outcome	<ul style="list-style-type: none">Proficient level of facilitation, always moving the de-brief in the required direction to improve trainee(s) competencies.Capable of making a challenging training session a positive experience by adding value in the session and debriefing.
4.6	Presentation technique	<ul style="list-style-type: none">Augment verbal instruction by the use of applicable training aids to enhance understanding and long-term memory retention.Instructor applicant avoids a chronological debriefing order.Demonstrates ability to clearly and concisely show the root cause of training events.
4.7	Clarity of Explanation	<ul style="list-style-type: none">Integrates TEM and CRM throughout the debriefing, developing airmanship.Instructor applicant creates an environment that allows a free flow of questioning.
4.8	Student participation	<ul style="list-style-type: none">Encourage self-assessment and self-evaluation developing trainees own critical awareness. Maintain balance as trainee(s) may be over self-critical.

- "Clear understanding of root causes..."
- "Proficient level of facilitation..."
- "avoids a chronological debriefing order"
- "Encourage self-assessment..."
- "...trainee(s) may be over self-critical"

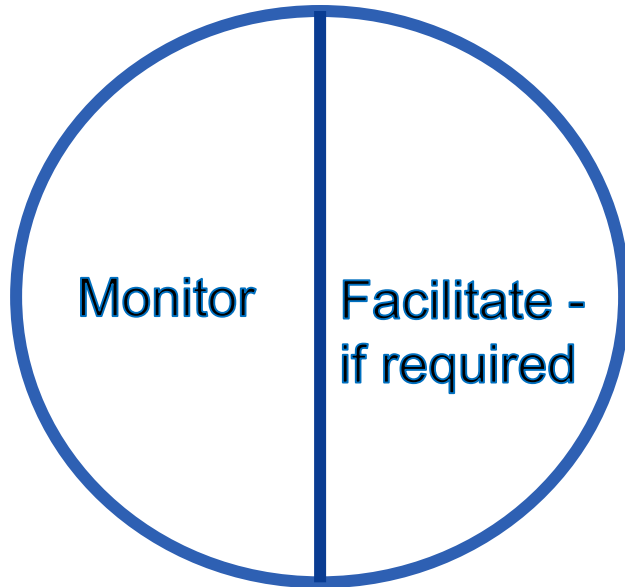
What is "a facilitated approach"?

Facilitated de-briefing

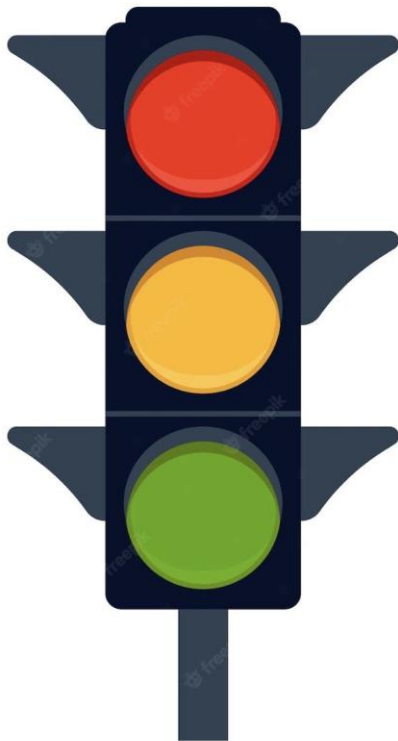
The objective(s) of a Facilitated de-briefing?

- Pilot/crew interaction in the de-briefing
- Self reflection - make every session/flight a positive learning event
- Examiners/Instructors should become better to "analyze" and determine the root cause(s) for observed performance
- Use of facilitation to optimize the learning outcome - outcome must create value!

The facilitated approach



Novice or proficient crew participation – 3 levels



YOU help them see it
YOU say it

YOU help them see it
THEY say it

THEY see it and reflect
THEY say it

Facilitation best practice

Before the session:

Friendly and relaxed atmosphere

Make sure everyone is informed about the 9 competencies (especially the crew/pilots)

Brief the crew/pilot before the session about their role(s) – how facilitation will be used

During the session:

Observe and maintain a friendly and relaxed atmosphere

After the session (de-briefing):

Select relevant learning points (must be addressed during the facilitated debriefing)

Ask open questions in order to optimize crew interaction, make sure to conclude

Facilitation is not the objective – it is a way to communicate an “approach”!

Facilitated de-briefing – Questions (examples)?

- Open questions – will ensure self-reflection
- Explain with your “own words”
- What part of the session/flight are you most proud of?
- What part of the session/flight is most important to discuss?
- What lessons can be learned from the session/flight?
- What is your opinion regarding “xxxx” exercise?
- What was the primary reason for the outcome of the “xxxx” exercise?
- Was the outcome of the session/flight as you expected?
- What did you as a crew do to make the CRM related competencies work so well?
- What part of the session/flight gave you the most “learning points”?
- Anything we need to address, before we summarize the session/flight outcome?
- Anything you would do differently, if we were to do the session/flight again?

The facilitated debriefing – Structure (6 elements)

- **OBSERVE** during the test/session
(ref.: 9 competencies / FCL requirements)
- **PLAN** the "structure" for a facilitated debriefing before the you start it!
(ref.: 9 competencies / FCL requirements)
- **OPENING** of the debriefing?
(how to do it – an open question)
- **CONDUCT** the debriefing
(ensure your plan is executed / adjust as required)
- **SUMMARIZE**
(ensure learning, value and accept)
- **ACTION PLAN**
(if you have any "open items" that calls for a follow-up)

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