

Workshop – Initial Certification and Continued Operational Safety

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Initial Certification and Continued Operational Safety

EASA WP on Better integration of human factors in CAW process

- Following safety recommendations and lessons learned exercise
- WP Implementation Plan established in 2022
- WP actions aimed at strengthening the Air OPS and CAW regulatory requirements, processes and methodologies for HF by:
 - Better capturing flight crew human performance issues
 - Analysing human performance issues in a more systemic manner by Air Operator/DAH
 - Ensuring corrective actions are implemented if necessary

Initial Certification and Continued Operational Safety

EASA WP on better integration of human factors in CAW process

- Flight crew performance issues addressed by this implementation plan:
 - occur in both normal and abnormal conditions
 - could create additional hazards in case of abnormal condition
- These human performance issues could be design or operations related

WP actions

1) Provide air operators with means to identify and report to DAH flight crew inconsistent actions and human performance issues occurring during training or flight operations

A Safety Promotion campaign

A refresh in Air OPS rules

An enhanced operator's FDM to address human performance issues

An enhanced HF taxonomy

2) Going beyond pure occurrence reporting to detect crew 'incorrect' actions/ reactions and human performance issues.

A SIB to clarify reporting and analysis of HF events from flight operations or operator training to DAH by operator

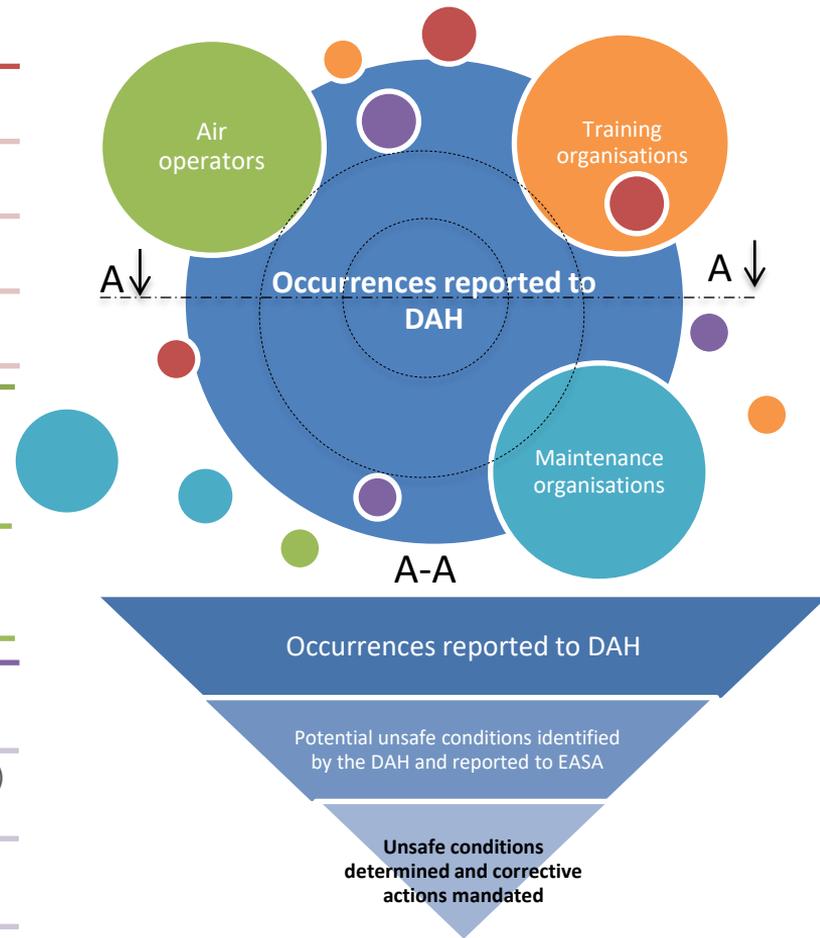
A D4S study to capture additional human performance issues

3) Provide DAH and EASA with means to address HF/ HP aspects when identifying and reporting potential unsafe conditions to the Agency.

A new Certification memorandum to Part 21.A.3 on CAW

On long term, update of the part 21.A.3A(a) to reflect the CM changes

The declination of the CM changes into the EASA process, DOA, WI, training, etc.



Reporting of In-service Occurrences Involving Human Interventions

EASA Safety Information Bulletin

Reporting of In-service Occurrences Involving Human Interventions

Draft Safety Information Bulletin (SIB):

- CAT Operators of CS/JAR/FAR 25 aeroplanes
- Report occurrences involving human intervention detected by:
 - flight crew during flight operations
 - instructors/examiners during training and checking

EASA SIB No.: 2023-XX

 **EASA**
European Union Aviation Safety Agency

Safety Information Bulletin
Operations

SIB No.: 2023-XX
Issued: XX September 2023

Subject: Reporting of in-service occurrences involving human interventions.

Ref. Publications:

- Regulation (EU) 2018/1139 dated 04 July 2018.
- Regulation (EU) 376/2014 dated 03 April 2014.
- Commission Regulation (EU) 965/2012 dated 05 October 2012.

1. Applicability

Commercial air transport (CAT) operators of CS 25/JAR 25/FAR 25 large aeroplanes.

2. Description

Under the scope of the Regulation (EU) 2018/1139, and more specifically with Regulation (EU) 376/2014 and the requirement ORO.GEN.160(a) in Regulation (EU) 965/2012, CAT operators shall mandatorily report occurrences¹ of which they become aware to their competent authority. Without prejudice to this mandatory reporting, CAT operators are further required by ORO.GEN.160(b) to report occurrences to the DAH.

The in-depth analysis of in-service occurrences involving human interventions² requires to be fully knowledgeable of the assumptions made by the DAH when demonstrating compliance with the certification basis (AW) about the expected flight crew behaviour in order to identify any deviations from these assumptions in the context of operation. Since it is not expected that operators own this knowledge, the responsibility of such analysis is therefore assumed to be assigned to DAH. However, the efficiency of the continuing airworthiness system implies that DAH are made aware by operators in a systematic and comprehensive way of events or trends that may reveal shortcomings related to flight deck design, operating procedures, training, or a combination of the three.

¹ In this SIB, the terms 'event' and 'occurrence' are used equally; they refer to safety relevant conditions encountered in service.

² Human intervention refers to any action or inaction taken by a flight crew in operation that preceded the safety occurrence. It can belong to different categories such as perception, planning and decision making, response execution and communication.

This is information only. Recommendations are not mandatory.

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Page 1 of 4

Reporting of In-service Occurrences Involving Human Interventions

Draft Safety Information Bulletin (SIB):

- SIB provides non-exhaustive list of possible contributing human interventions that could lead or contribute to a reduction in safety margins
- Operators to analyse and report to DAH
- DAH to perform analysis to determine if a possible unsafe condition exists

EASA SIB No.: 2023-XX

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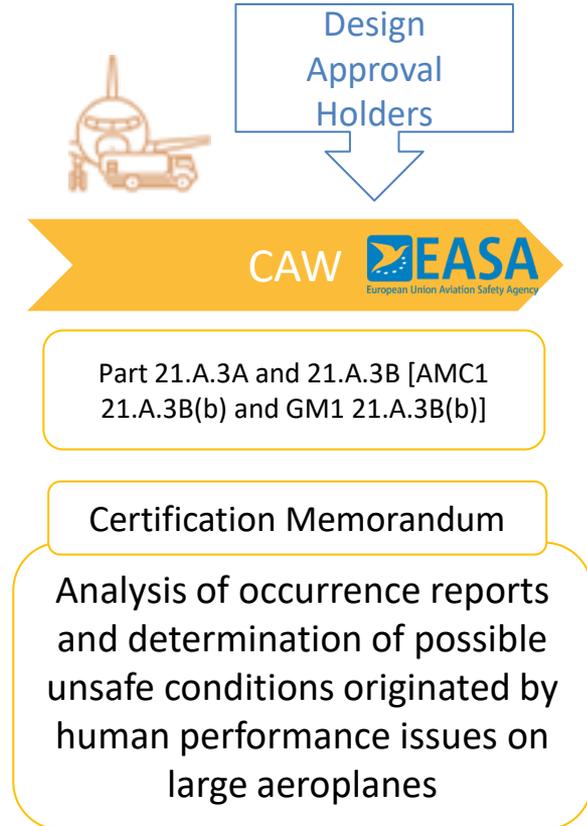
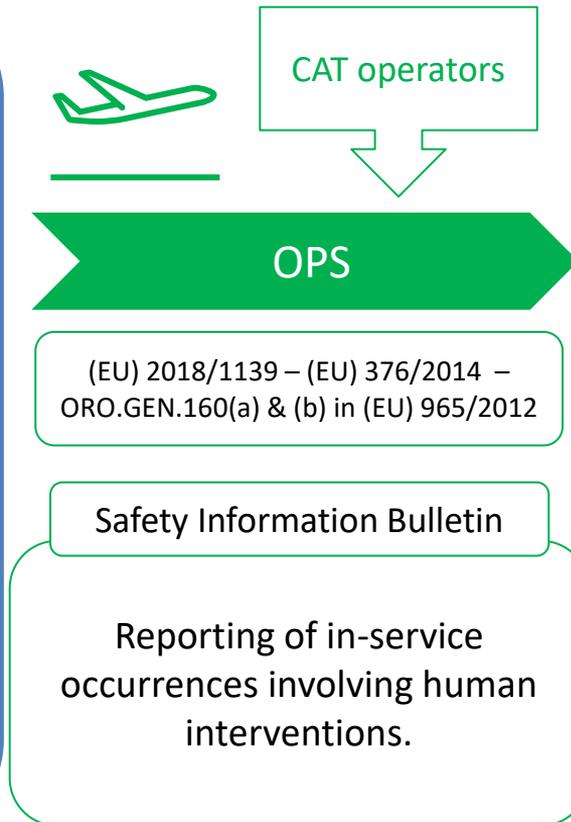
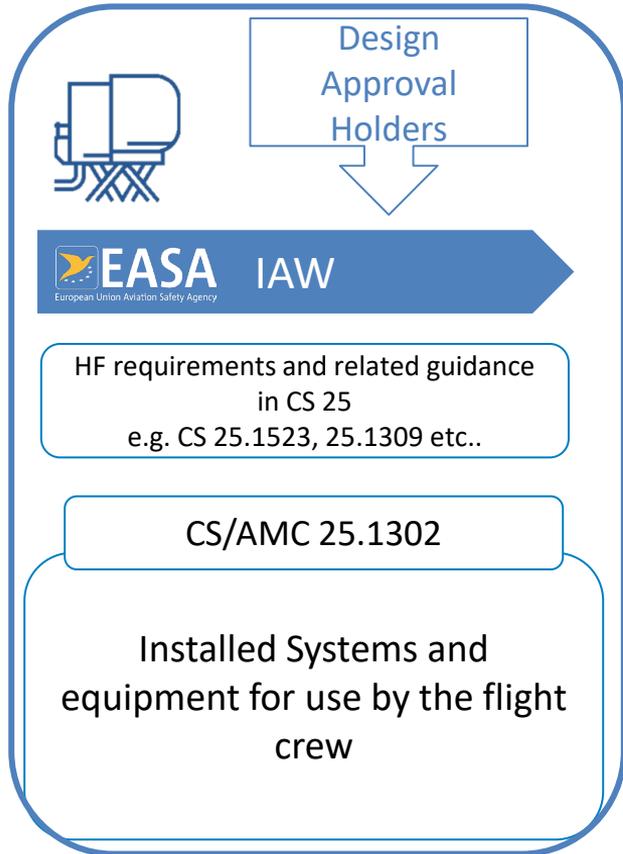
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EASA Approach to Human Factors in Continued Airworthiness

Human Factors from IAW to CAW



Certification policy and guidance harmonization

- CATA Worklist Item (CWI) EASA-003
25.1302: Installed Systems and Equipment for Use by the flight crew (Aug.22)
- CMTS Task Specific Team (TST) Report
25.1322: Interpretation differences in addressing Flight Crew Alerting (Feb.23)
- CWI EASA-007
25.1309: Human Factors in System Safety Assessment (Target date: Q1 2025)



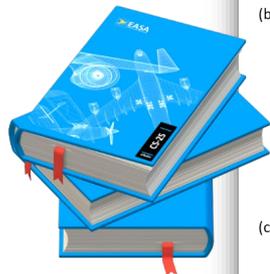
Federal Aviation
Administration



Transport
Canada

Transports
Canada

Human Factors approach in IAW



This point applies to installed equipment intended for use by crew members in the operation of the rotorcraft from their normal seating positions in the cockpit or operating positions in the cabin. This installed equipment must be shown, individually and in combination with other such equipment, to be designed so that trained crew members can safely perform their tasks associated with the intended function of the equipment by meeting the following requirements:

- (a) All the controls and information necessary to accomplish these tasks must be provided;
- (b) All the controls and information required by paragraph (a), which are intended for use by the crew, must:
 - (1) be presented in a clear and unambiguous form, at a resolution and with a precision appropriate to the task;
 - (2) be accessible and usable by the crew in a manner consistent with the urgency, frequency, and duration of their tasks; and
 - (3) make the crew aware of the effects that their actions may have on the rotorcraft or systems, if they need awareness for safe operation.
- (c) Operationally relevant behaviour of the installed equipment must be:
 - (1) predictable and unambiguous; and
 - (2) designed to enable the crew to intervene in a manner appropriate to accomplish the task.
- (d) Installed equipment must enable the crew to manage the errors resulting from the kinds of crew interactions with the equipment that can be reasonably expected in service, assuming the crew is acting in good faith. Paragraph (d) does not apply to skill-related errors associated with the manual control of the rotorcraft.

CS 25.1302

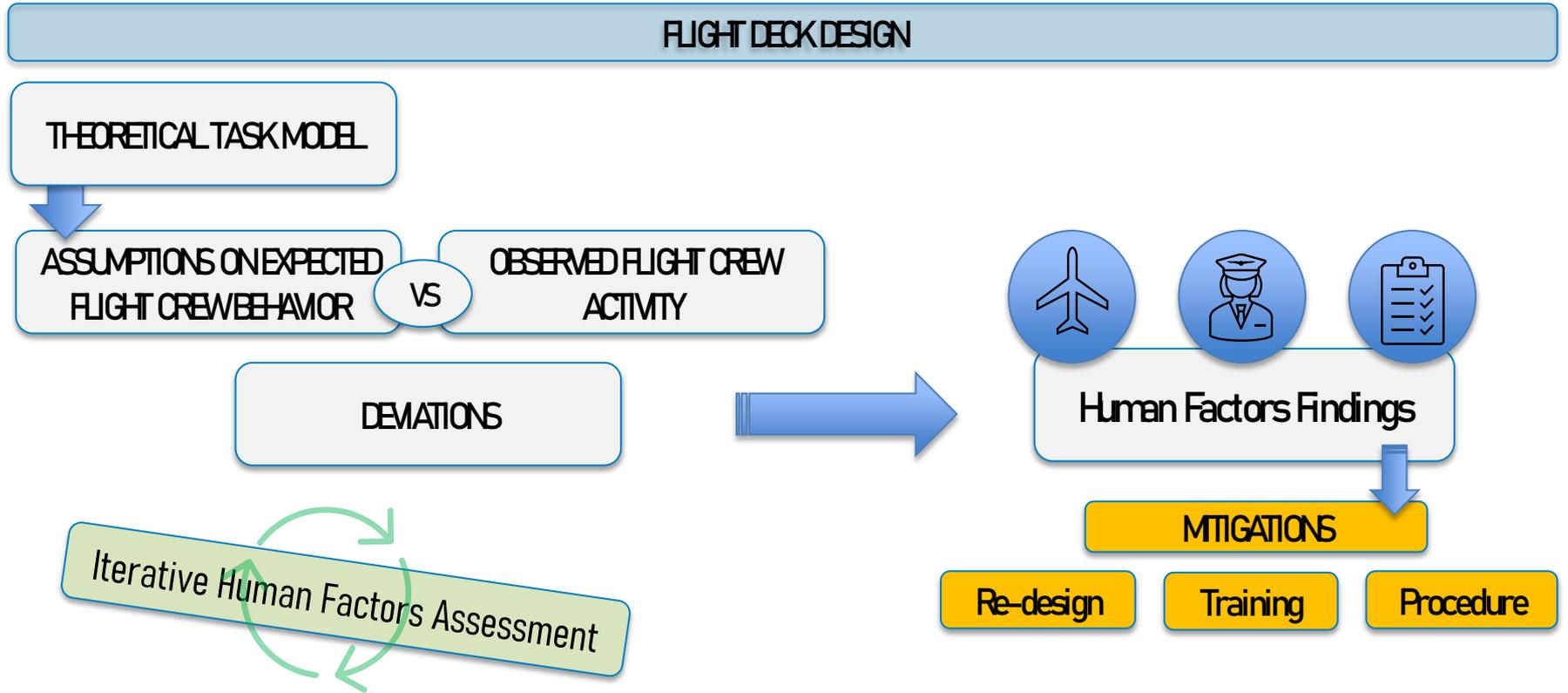


**REDUCE DESIGN
CONTRIBUTION TO
HUMAN ERROR**



**SUPPORT ERROR
MANAGEMENT**

Human Factors process in IAW



Limitations of HF IAW process

LIMITATIONS OF FLIGHT DECK CERTIFICATION OR APPROVAL

- In service experience, additional testing, further analysis, etc., may show that **certain initially accepted assumptions are not correct.**
- Thus, certain conditions initially demonstrated as safe, **are revealed by experience as unsafe.**

CAW

GUIDANCE FOR MEANINGFUL ANALYTICAL HF APPROACH AND METHODOLOGY



The image shows a screenshot of an EASA document titled "EASA Proposed CM No.: Proposed CM-21.A-A-003 Issue 01". The document is a "Certification Memorandum" titled "Analysis of occurrence reports and determination of possible unsafe conditions originated by human performance issues on large aeroplanes". It is dated "EASA CM No.: CM-21.A-A-003 Issue 01 issued DD Month 2023". The regulatory requirements are listed as "Part 21.A.3A and 21.A.3B [AMC1 21.A.3B(b) and GM1 21.A.3B(b)]". A disclaimer states: "EASA Certification Memoranda clarify the European Union Aviation Safety Agency's general course of action on specific certification items. They are intended to provide guidance on a particular subject and, as non-binding material, may provide complementary information and guidance for compliance demonstration with current standards. Certification Memoranda are provided for information purposes only and must not be misconstrued as formally adopted Acceptable Means of Compliance (AMC) or as Guidance Material (GM). Certification Memoranda are not intended to introduce new certification requirements or to modify existing certification requirements and do not constitute any legal obligation." A final note says: "EASA Certification Memoranda are living documents into which either additional criteria or additional issues can be incorporated as soon as a need is identified by EASA."

CM guidance overview



Guidance for in-depth HF analysis by DAH to determine



If the occurrence reveals any Human Performance Issue (HPI)



What is the root cause(s) of the HPI



If it may lead to a possible unsafe condition

CM guidance overview



Guidance for in-

Human Performance Issues

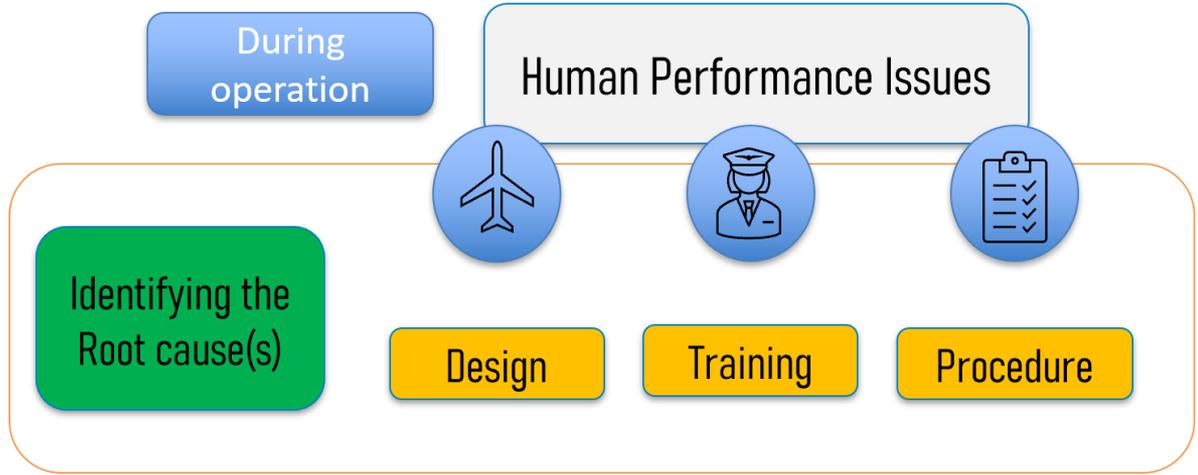


If the
 If it may lead
 What is the
 to possible
 root cause(s)
 Unsafe
 of the HPI
 Condition
 Issue (HPI)

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operation;
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operating c
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resulted (on those
11. The description of
12. The subjective severity of the observed operational consequences.

During operation

Human Performance Issues



Identifying the
 Root cause(s)

Design

Training

Procedure

Determination of an HF unsafe condition

As per AMC1 21.A.3B(b)

“an unsafe condition exists if there is factual evidence (from service experience, analysis or tests) that:

- (a) An event may occur that would result in fatalities, usually with the loss of the aircraft, or reduce the capability of the aircraft or the ability of the crew to cope with adverse operating conditions to the extent that there would be:
 - (i) A large reduction in safety margins or functional capabilities, or
 - (ii) Physical distress or excessive workload such that the flight crew cannot be relied upon to perform their tasks accurately or completely, or
 - (iii) Serious or fatal injury to one or more occupants
- (b) There is an unacceptable risk of serious or fatal injury to persons other than occupants, or
- (c) Design features intended to minimise the effects of survivable accidents are not performing their intended function.”

This new sentence should apply

unless, for an event originated by human interventions, it is shown that the means provided for the human performance issues' prevention, detection and management are robust enough so that the likelihood of such an event is low, or

Not for HPI



Thank you

Use Slido for questions