



**EASA**  
European Aviation Safety Agency

# CRM in Practice SPT.079

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# Rulemaking task 'CRM training' – main features

- Amending the AMC/GM
- Restructuring and rephrasing to improve clarity and readability
- Modernisation by incorporating new items
- Decision 2015/022/R and 2015/023/R
  - Published on September 2015
  - Entered into force on 1 October 2016



# Rulemaking – main affected paragraphs

## ➤ Regulation 965/2012 – Decision 2015/022/R

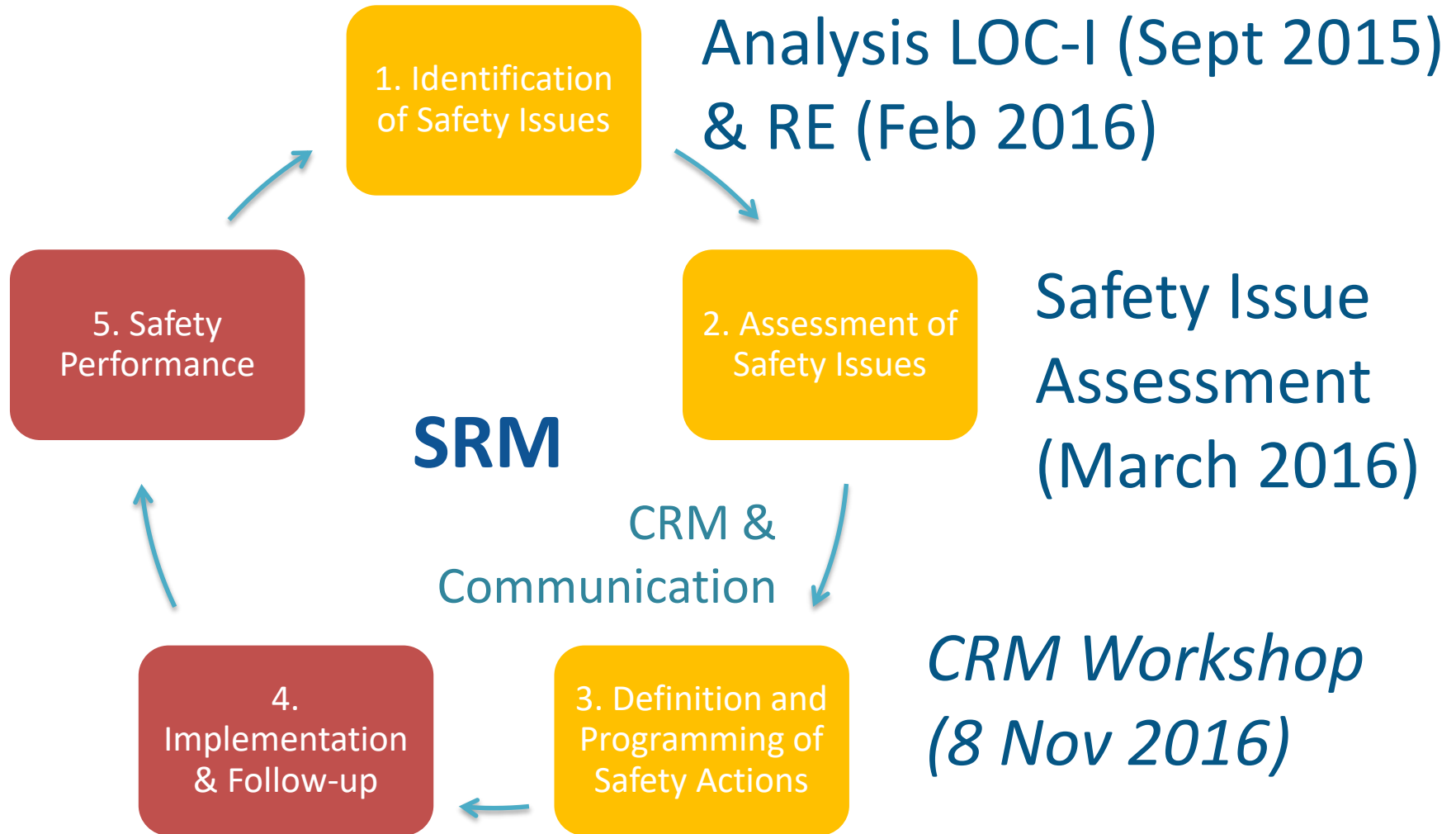
- Competent authority – number and qualification of personnel
  - ARO.GEN.200(a)(2) Management system
- Flight crew
  - ORO.FC.115 CRM training
  - ORO.FC.215 Initial operator's CRM training
- Cabin crew
  - ORO.CC.115(e) Conduct of training courses and associated checking
- Technical crew
  - ORO.TC.110(a) Training and checking
- Medical passenger
  - SPA.HEMS.135(a) HEMS medical passenger and other personnel briefing

## ➤ Regulation 1178/2011 – Decision 2015/023/R

- Cabin crew
  - Appendix 1 to Part-CC(3) Initial training course and examination



# Safety Risk Management process





# From the workshop to EPAS 2017-2021

## Safety Promotion

### **SPT.079** Crew resource management (CRM) training best practices

The EASA Safety Risk Management process has identified CRM as the second most important human factors issue in the domain of CAT Aeroplanes. New AMC/GM on CRM Training were adopted in 2015 and entered into force in October 2016. An in-depth assessment of the safety issue concluded that additional actions in the area of safety promotion were needed, which led EASA to organise a workshop on the subject. On 8 November 2016, 80 delegates representing operators, CAs, professional associations and training providers met to share experience and best practices on CRM practical implementation. The workshop was an excellent opportunity for the practitioners to discuss how this important safety net should work in practice. The purpose of this safety promotion task is to take stock of and disseminate the best practices discussed during the workshop.

Owner	Activity sector	Deliverable	Date
EASA FS.3	ALL, HF	Best practice	2017



# SPT.079 – CRM Best Practices

Invite contributions on latest AMC and GM implementation

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NAA

Qualification and training for inspectors

Oversight of operator's CRM training

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CRM training and management system

Automation and philosophy on its use

Operators

Monitoring and intervention

Resilience development

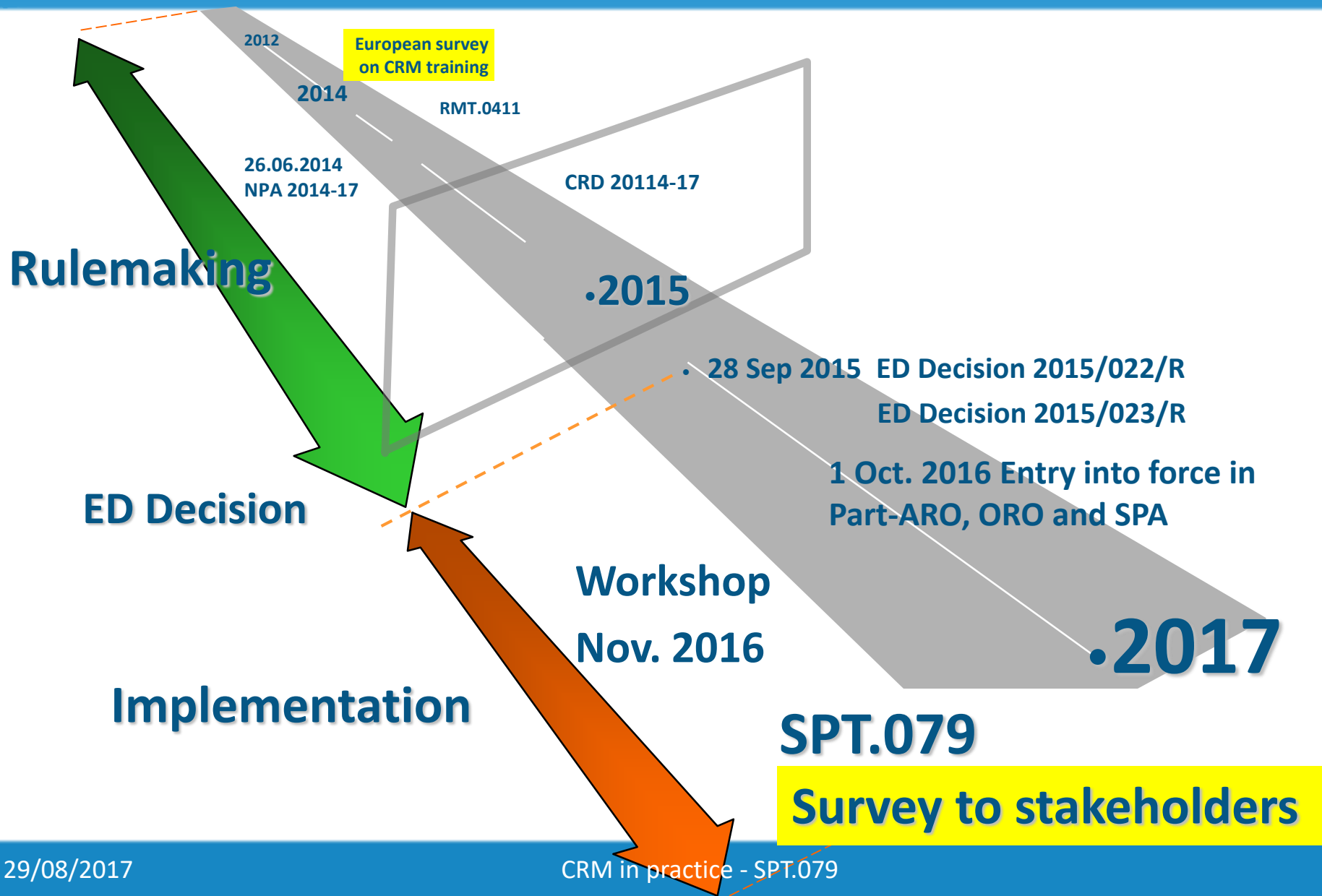
Surprise and startle effect

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Cultural differences



# SPT.079 – way forward





# Next steps

- List all documentation freely available
- Consolidate survey results during the workshop
- Publish available practices online

## CRM training

Fields marked with \* are mandatory.

### 1. Introduction

The EASA Safety Risk Management process has identified Crew Resource Management (CRM) as the second most important human factors issue in the domain of aeroplanes Commercial Air Transport. At the same time CRM training is prone to subjective assessments, resulting in differing interpretations and conclusions.

EASA Executive Director Decisions [2015/022/R](#) and [2015/023/R](#) introduced new AMC/GM on CRM Training which entered into force in October 2016.

An in-depth assessment of the safety issue concluded that actions in the area of safety promotion were needed. It led EASA to organise a workshop on "CRM in practice" in November 2016 to discuss how operators, flight crews and authorities implement and oversee CRM and measure effectiveness ([CRM workshop presentations](#)).

Based on the feed-back received during this workshop, the Agency committed to continue with a Safety Promotion Task to gather and share best practices on this subject. The objective is to go more in depth, get a wider contribution and share methodologies as well as best practices on the implementation in practice of those CRM AMC and GM. An aggregated overview will be made publicly available on the EASA Safety Promotion website.

You will find below a questionnaire designed for Air Operators and for National Aviation authorities. The objective is to elicit information on the methods used in both Air Operators and National Authorities to improve CRM training and develop the latest training provisions.

### 2. Deadlines for submitting responses to the survey

We would be grateful if you participate in this questionnaire and help us in the collection of expertise and best practices in that matter. Please send your responses by **30 June 2017**.

### 3. Confidentiality

Please note that all data will be treated with confidentiality. They will be aggregated in a report (at Member State level and/or per type of stakeholder) to avoid the possibility to recognise any entity or person who answered to the survey. Any information which will be used for the purpose of the report will be de-identified to ensure the confidentiality of the respondents.



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# Survey results overview

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CRM in practice - SPT.079



# SPT.079 – Survey on CRM in practice

## Issues raised during CRM Workshop 8 nov. 2016

- Link between CRM training and SMS
- Better understanding of skills, needs and roles for the different individuals involved in CRM training (incl. Inspectors)
- Assessment of CRM training at operators
- Guidance shared is sometime superficial

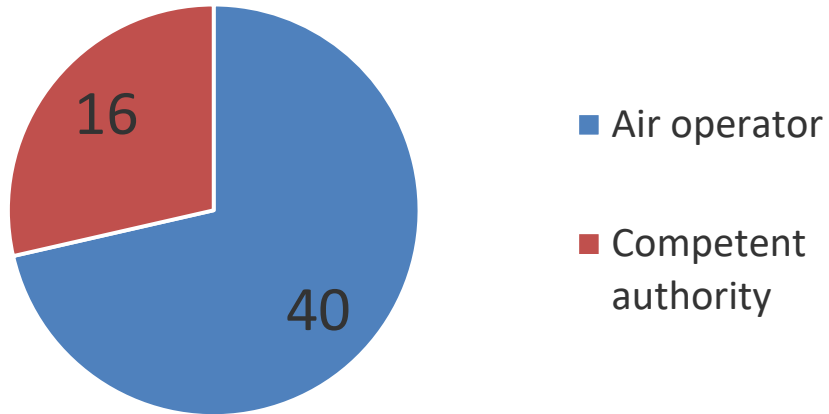
## Survey on CRM Training

- 9 June -> 15 July 2017
- TeB Members, FS STeB



# Respondents overview

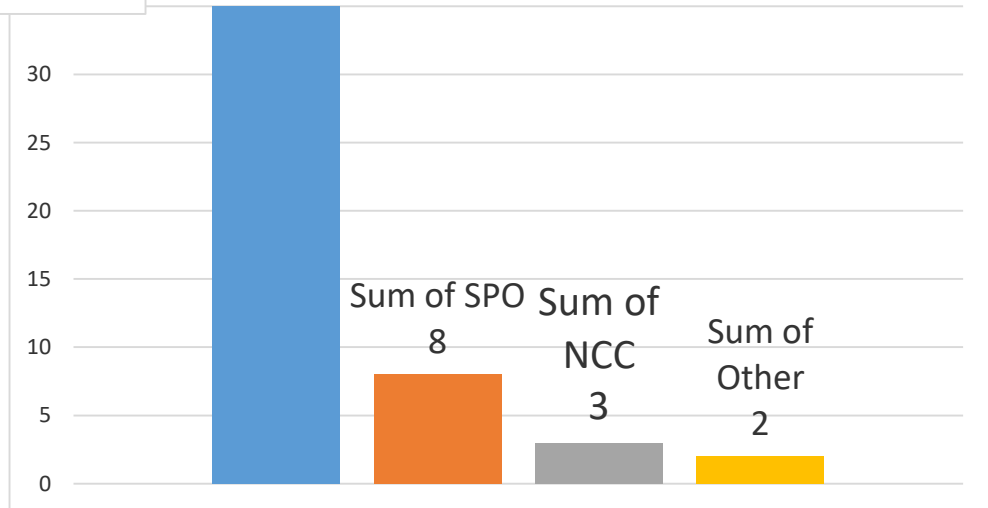
Number of respondents



Air operator respondents by type

Sum of AOC

35

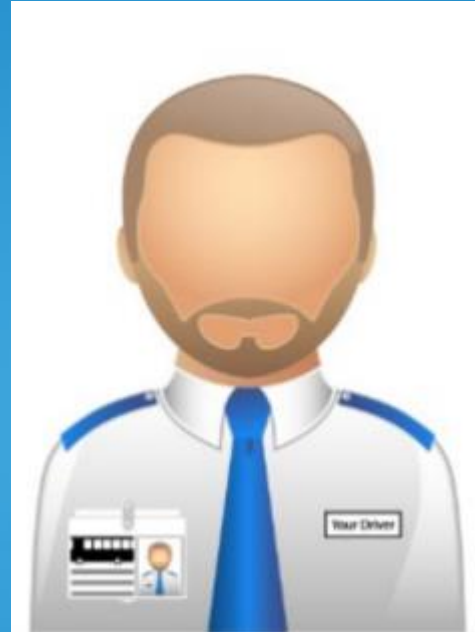




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## Authority perspective



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1. Did you have to make changes, if any, to implement new AMC and GM on CRM training applicable since October 2016?



Creation of a working group involving FOIs, HF experts. Identification of training needs for FOIs.

Changes in training for CRM/HF trainers

New mandatory training syllabus for the inspectors to cover changes in ARO.GEN.200

Update on oversight C/L and procedures



Information and Safety Promotion to Operators





## 2. As Competent Authority for operators oversight, is the CRM training for inspectors made internally or subcontracted to another external provider?

### ➤ Internal training developed

- Estonia,
- UK,
- Sweden,
- France,
- Croatia,
- Germany

...

- Iceland

Note: difficulties in finding relevant training for Authorities



### 3. How do you ensure that inspectors are qualified and trained for the oversight of the operator's CRM training including the assessment of non-technical skills?

#### ► Inspectors background

- [ED Decision 2017/006/R](#)

GM7 ARO.GEN.200(a)(2)  
Management system

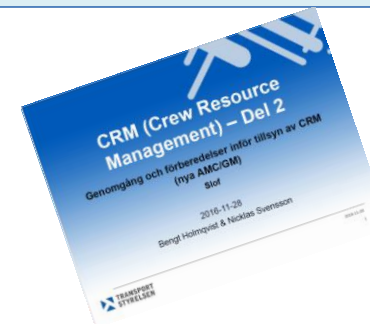
***In the context of the approval and oversight of aircraft specific flight crew training and checking, the inspector should have experience as an instructor.***

- Practical guide on the use of pilots as inspectors



#### ► Initial and recurrent Training

- For CRM instructor and FOI
- Check-List for CRM oversight and
- NOTECHs sessions introduced
  - Video on cockpit scenarios
  - Simulator sessions, mock-up training





## 4. How do you evaluate the effectiveness of CRM training?





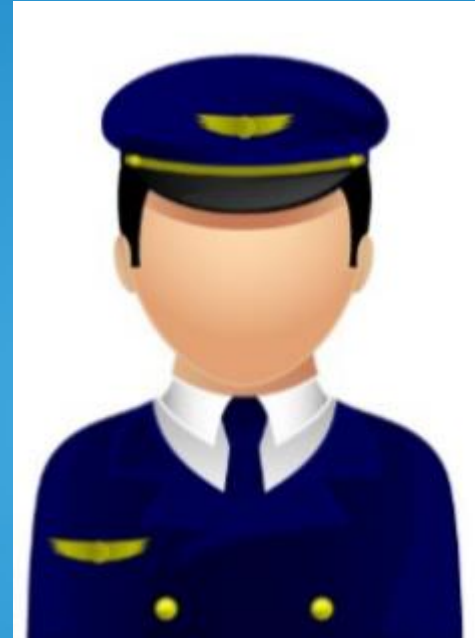
## 4. How do you evaluate the effectiveness of CRM training?

- Time is needed to implement
- Criteria suggested
  - Compliance monitoring
    - Initial theoretical knowledge (up-to-date)
    - CRM trainers qualification and training criteria
  - Measurable impact
    - Capacity to identify relevant CRM indicators in practical sessions
    - Implementation in SMS. Operators themselves should develop tools to assess the effectiveness of their training and link the CRM program to their SMS



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# Organisation perspective



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# 1. Changes to implement new AMC and GM on CRM training applicable since October 2016?

- Operation Manual Part D & ATO Manuals shall be adapted
  - Review all existing training programmes
  - Training Manual for CRM trainers
  - Nominate experience flight crew CRM trainers
  - Combined CRM Training implemented with new exercises.
- Introduction of CRM check in Operator Proficiency Check and Line Check forms





# 1. Changes to implement new AMC and GM on CRM training applicable since October 2016?

## Suggestions:

- Allocate more time to CRM
- Develop new « assessment forms »
- Crew representatives involved in the development of CRM assessment methodology
- Construction of CRM 'Library' for crew, instructors and examiners on eLearning platform





### 3. How is CRM training connected to your Management system? What main source of information do you use?

➤ Source for training development includes

➤ Operational risks identified by SMS

➤ Training issues

➤ reported from OPC, recurrent training...

➤ Data analysis of simulator data (recurrent programme)

➤ CMS and Change Management when introducing a new type of operation or product

➤ Proportionate implementation for small fleet and company



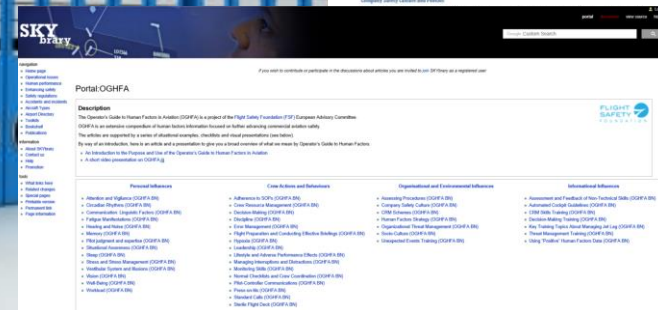
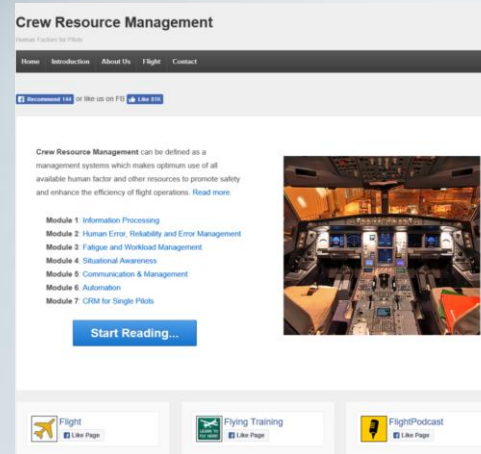
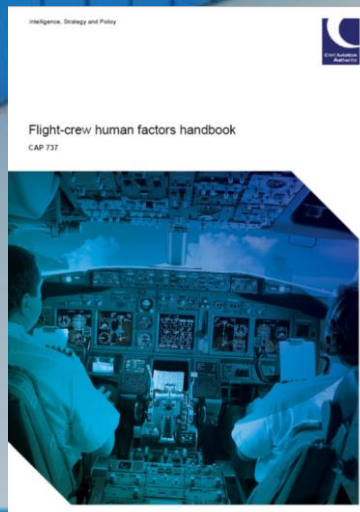
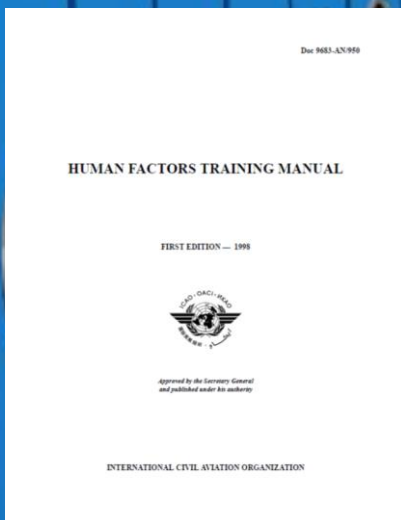


## 4. How do you ensure that CRM training address all highlighted elements (resilience, automation...)

- Creation of CRM Learning Objectives matrix to give common focus for the Instructor and student on CRM topics relevant for the FSTD session.
- Each CRM LO supported by:
  - CRM Library to review where relevant by both Instructor (Preparation) and student
  - Instructor/ student pre-course review of lesson CRM learning objectives.
  - Inclusion of CRM Learning Objectives into briefing and debriefing. Identification of appropriate areas and exercises within the pre-simulator briefing and simulator training session to integrate the CRM concepts.
  - Identification of CRM weaknesses that could cause errors and identify CRM principles that can create safety margins.
  - Integration and linking of CRM to technical concepts and their relationship with each other.



# Guidance and general practice



## Crew Resource Management

**Introduction**  
Crew Resource Management (CRM) is defined by regulations and encompasses a broad number of training for emergency specific operations, such as multi-crew flight deck operations.

**Objectives**  
The objectives of CRM are to ensure that the crew is able to work together effectively in order to prevent or reduce the risk of an accident.

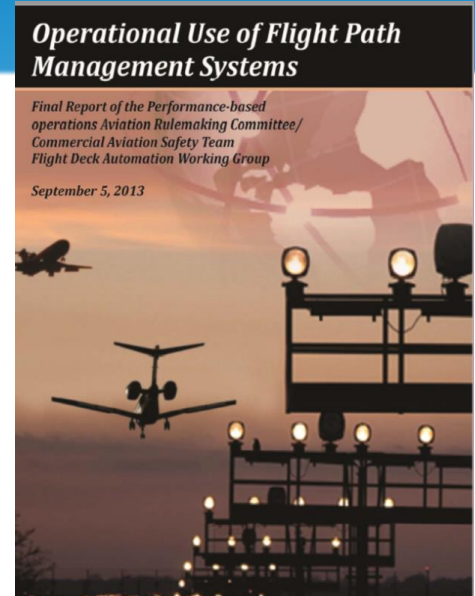
**Training**  
The objectives of CRM training are to ensure that the crew is able to work together effectively in order to prevent or reduce the risk of an accident.





# Automation and the philosophy on use of automation

Flight path management policy is more relevant than an automation policy

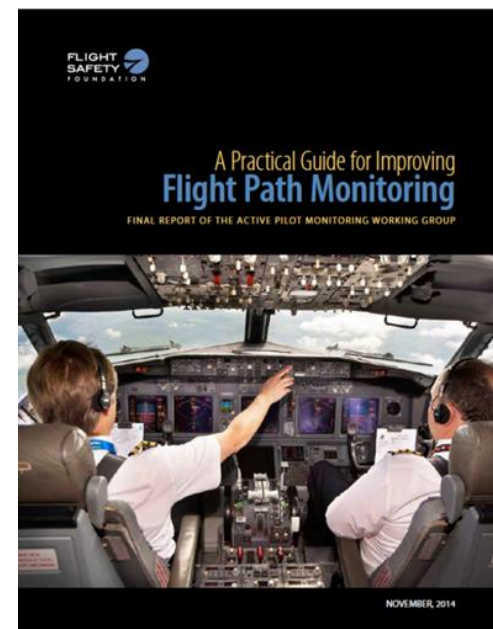
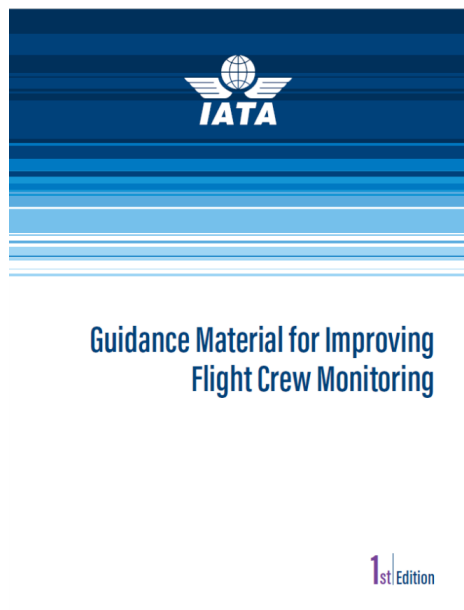


- [Operator's Guide to Human Factors in Aviation – Automated Cockpit Guidelines](#)
- [Flight Safety Foundation ALAR Briefing Note 1.2 “Automation”](#)
- [Airbus FOBN – Optimum Use of Automation](#)
- [Eurocontrol, Hindsight 20 - Winter 2014](#)
- [EASA Automation Policy – May 2013](#)
- [IFALPA Pilot Training Standards – 1st Edition, September 2012](#)



# Monitoring and intervention

- SOPs and AFM with special attention on:
  - Mode awareness
  - Automation surprise
  - Over-reliance / complacency





## Resilience Engineering



the academic pursuit of flight safety  
postmaster@raes-hfg.com

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### SAFETY CULTURE AND RESILIENCE DEVELOPMENT (INCLUDING SOPS AND ORGANISATIONAL FACTORS)

#### ENGINEERING RESILIENCE

In August 2016, Aerospace published an article regarding the upcoming changes to the CRM training syllabus, specifically the inclusion of Resilience as a topic. As one of the leaders in the area of training resilience, Luxair have kindly agreed to share their training material freely so that other airlines can learn from their experiences of training crew in this vital topic. From the team at the Royal Aeronautical Society Human Factors group, we'd like to thank Luxair and especially Captain Marc Frank and his team of instructors for sharing their superb work. A big thank you to Gunnar Steinhardt and Arthur Dijkstra for their work as well. An introduction to the topic, a PowerPoint presentation and instructor notes can be found below:

[Introduction note about resilience V4](#)

[Luxair RE CRM Rec 2013 v4](#)

[Luxair Trainer Handout RE CRM Recurrent V4](#)





# Surprise and startle effect

## ➤ UPRT due to

- Pilot-Induced trigger
- Environment-Induced trigger
- System-induced trigger

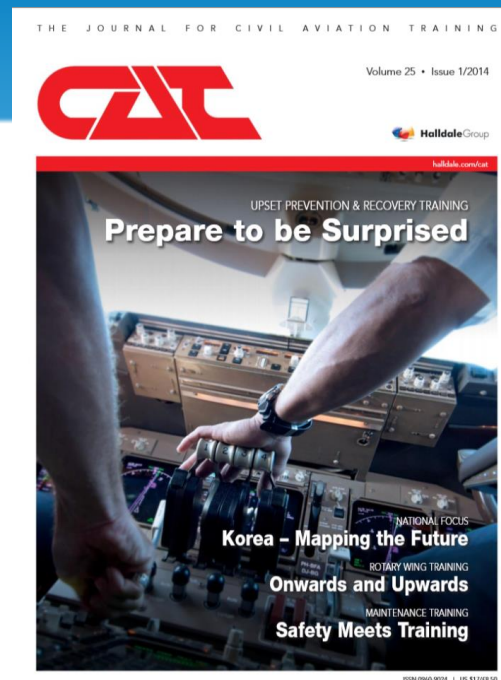


Environmental Factors Affecting  
Loss of Control In-Flight:  
Best Practice for  
Threat Recognition & Management

1<sup>st</sup> Edition

## ➤ Unexpected, unusual and stressful situations covering surprises and startle effects and management of abnormal and emergency situations enable to cover:

- Manage crew resources and analyse
- Exercise adequate behavioural response
- Rebuild situation awareness and control





## 5. What methodology are you using to assess CRM skills?



NOTECHS - GM6  
ORO.FC.115



Core competences of ICAO  
Doc.9995 – Manual of EBT



EBT Implementation Guide



## 6. How do you ensure that CRM trainers are trained in the fields of group management, group dynamics and personal awareness?



**Train-the-Trainer  
'interactive course  
conduct'**

**New scenarios  
Be ready as facilitator  
Expectations...**



**Assessment or trainers  
CMS  
Update briefings**



**Trainers performance**



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# Thank You

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