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Abteilung Sicherheit Flugbetrieb, Sektion SBFF

FRM - Fatigue Risk Management - a System for Operators

Implementation Switzerland

08.Sept.2015 Olten

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Objectives



- Legal Framework
- Target Group
- Where is FRM explicitly required?
- FRM development
- FRM System overview
- How FOCA will certify the FRMs



FRM, what else ?

- obligations in regard to fatigue



What is a FRMS?

A **data-driven** means of continuously **monitoring** and **managing fatigue**-related safety risks, based upon:

- scientific principles
- knowledge
- operational experience

to ensure personnel are performing at adequate levels of alertness.

ICAO DOC9966



Essential elements of the FRMS

- Fatigue risk management **policy**
- Processes for the **detection, reporting** and **investigation** of fatigue risk and incidents that may be attributable wholly or partially to fatigue
- Processes for **monitoring** fatigue
- Mechanism for **feedback** within management system
- Education and awareness **training** programme



Operators responsibility



Basic Regulation No 216/2008

ANNEX IV

Essential requirements for air operations referred to in Article 8

8.f. The prevention of fatigue must be managed through a rostering system.

For a flight, or series of flights, such a rostering system needs to address:

- flight time,**
- flight-duty periods,**
- duty and adapted rest periods.**



Operators responsibility



8.f. ...

Limitations established within the rostering system must take into account all relevant factors contributing to fatigue...

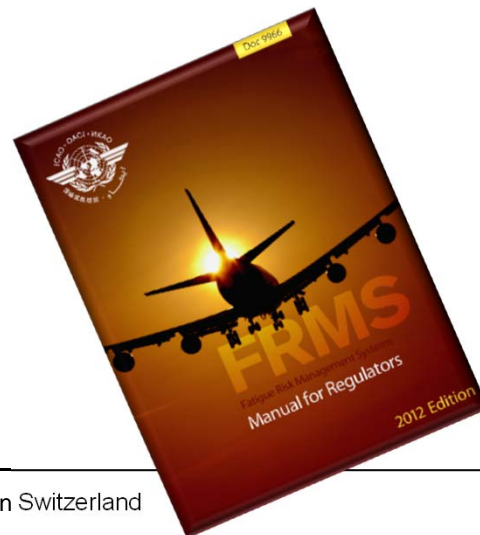
- number of sectors flown
- time-zone crossing
- sleep deprivation
- disruption of circadian cycles
- night hours
- positioning
- cumulative duty time for a given time
- sharing of allocated tasks between crew
- the provision of augmented crews



ICAO source documents



- ICAO Annex 6 Operation of ACFT part II 8th. Edition 2012 (Fatigue management programme referring to ICAO DOC 10033)
- ICAO DOC 9966 – first edition 2012
- ICAO/IATA/IFALPA FRMS Implementation guide for operators





Legal Framework

EU

- (EC) 216/2008 amended (Basic Reg.)
- (EU) 965/2012 amended (IRs Air OPRs.)
- **(EU) 83/2014 with Subpart FTL**

EASA

- AMC and GM to Annex III – Part ORO
- CS-FTL.1





FRM Target group

The regulations concerning FRM apply to:

- Commercial Air Transport aeroplane operators (using CS.FTL and a rostering system)- **Airlines**

However, the following groups are currently exempt from the regulations:

- Air taxi operators of aeroplane ≤ 19 seats
- Emergency Medical Services (EMS)
- Single pilot operations
- Helicopter operations





FRM specifically required

**☞ CS FTL.1.205 Flight Duty Period (FTP)
Higher maximum Flight duty for crew in
unknown state of acclimatization**

**☞ CS FTL.1.205 (a)(2) Flight Duty Period
“Long Night Duties” longer than 10 hours**

**☞ CS FTL.1.235 Rest Periods (c)
Reduced rest period application**



FRM required

☞ CS FTL.1.205 Flight Duty Period (FTP)

No FRM /unknown state of acclimatisation

Maximum daily FDP according to sectors

1-2	3	4	5	6	7	8
11:00	10:30	10:00	09:30	09:00	09:00	09:00

with FRM and safety perf. Monitoring

Maximum daily FDP according to sectors

1-2	3	4	5	6	7	8
12:00	11:30	11:00	10:30	10:00	09:30	09:00



FRM required

☞ CS FTL.1.205 Flight Duty Period (FTP)

(a) Night duties under the provisions of ORO.FTL.205(b) and (d) comply with the following:

(1)...

(2) The operator applies appropriate fatigue risk management to actively manage the fatiguing effect of **night duties of more than 10 hours** in relation to the surrounding duties and rest periods.

Nightduty (02:00-04:59) > 10 hours = FRM



FRM required

☞ CS FTL.1.235 Rest Periods

(c) Reduced rest

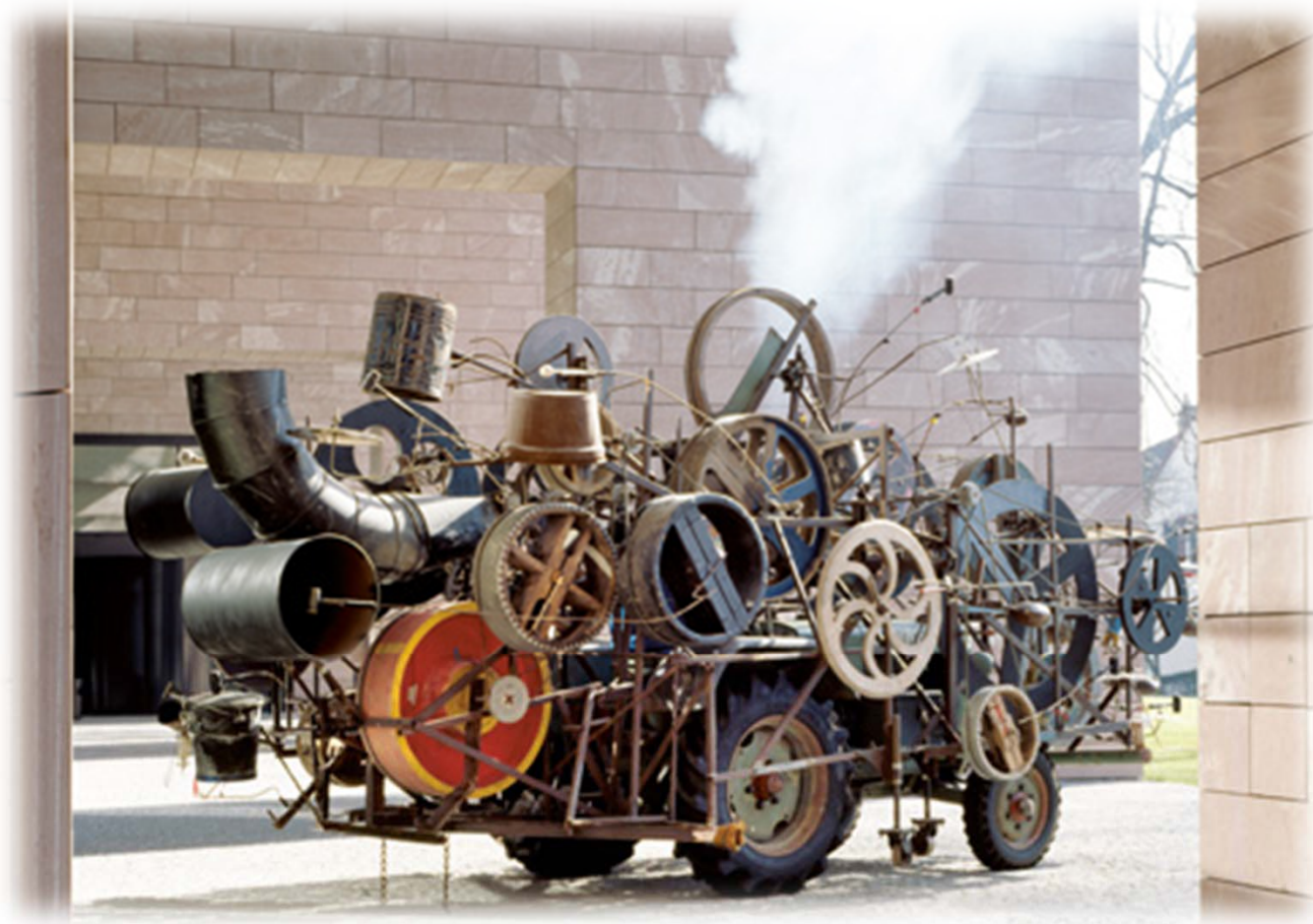
(1) The **minimum reduced rest periods** under reduced rest arrangements are 12 hours at home base and 10 hours out of base.

(2) **Reduced rest is used under fatigue risk management.**

Min Rest without FRM (greater of)
- home base $\geq 12\text{h}$ or as long as prev. duty
- out of h.base $\geq 10\text{h}$ or as long as prev. duty



The Organisation Mgmt. System evolves further..





FRM an integral part of the OM system

ORO.FTL.120 Fatigue risk management

(a) When FRM is required by this Subpart or an applicable certification specification, the operator shall establish, implement and maintain a **FRM as an integral part of its management system.**



FRM system overview I

- ✓ Ideally an **integral part** of the management system OMM/A/D;
- ✓ correspond to type, size and complexity of operations and the applicable flight time specification scheme;
- ✓ Should **balance** duty types including rest and recovery periods;
- ✓ Include an internal, **scientifically based data driven** modulation process affecting all parts of planning and operations;



FRM system overview II

- ✓ consider short and longterm fatigue accumulation;
- ✓ gives operational flexibility with a constantly high level of safety
- ✓ Should contain all relevant aspects which contribute to fatigue
 - complexity of operations, WX,
 - equipment,
 - time of day, crossing time zones and many more);
- ✓ Should consider scientific rostering data;



FRM as part of Management System





Three processes for hazard ident



Predictive

The predictive process should identify fatigue hazards by examining crew scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance.





Three processes for hazard ident



Proactive

The proactive process should identify fatigue hazards within current flight operations.

The image shows a 'SWISS AVIATION NOTIFICATION SYSTEM (SWANS) Reporting Form'. The form is divided into several sections:

- 1. Reporting criteria:** A box containing text about reportable incidents, including service interruptions, defects, malfunctions, or other deficiencies which have constituted a danger, or could jeopardize the safety of an aircraft, its occupants or other persons.
- 2. Reporters' details (optional):** A section for providing contact information, including fields for Contact name, Contact address, Telephone, Date, Fax, Email, and Additional.
- 3. Details concerning the incident:** A section for providing specific details about the incident, including Date & Time (UTC), Location, Aircraft registration, and a question: 'Has the incident been notified to another organization? (If yes, to whom and when?)'.

The form also includes sections for 'TAKEOFF INFORMATION', 'LANDING INFORMATION', 'MEASUREMENTS', and 'EVENTS SUMMARY', each with various data entry fields and checkboxes.

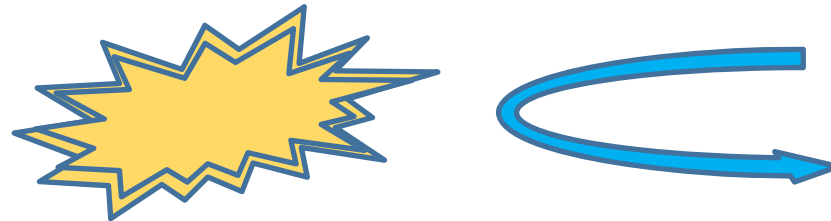


Three processes for hazard ident



Reactive

A process should identify the contribution of **fatigue hazards** to **reports and events** associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimised.





Risk Assessments FRM

An operator should develop and **implement risk assessment** procedures that determine the probability and potential severity of fatigue-related events and identify when the associated risks require mitigation.

Severity \ Probability		Frequent	Likely	Occasional	Seldom	Unlikely
		A	B	C	D	E
Catastrophic	I	E	E	H	H	M
Critical	II	E	H	H	M	L
Moderate	III	H	M	M	L	L
Negligible	IV	M	L	L	L	L

Definitions of Severity

- **Catastrophic:** Death or permanent total disability, system loss, major property damage
- **Critical:** Permanent partial disability, temporary total disability in excess of 3 months, major system damage, significant property damage
- **Moderate:** Minor injury lost workday accident, compensable injury or illness, minor system damage, minor property damage
- **Negligible:** First Aid or minor supportive medical treatment, minor system impairment

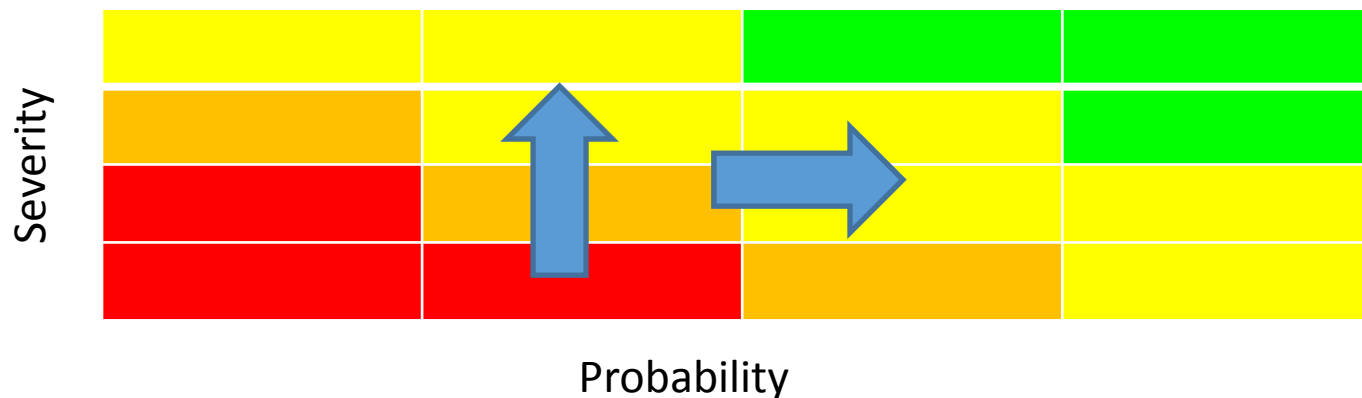
Definitions of Probability

- **Frequent:** Occurs often, continuously experienced
- **Likely:** Occurs several times



RISK MITIGATION FRM

An operator should develop and implement risk **mitigation procedures** associated to fatigue





Safety Assurance FRM

The operator should develop and maintain FRM safety assurance processes

- a) provide for continuous FRM performance **monitoring, analysis** of trends, and **measurement** to validate the effectiveness of the fatigue safety risk controls.
- b) Provide a formal process for the **management of change**
- c) Provide for the **continuous improvement of FRM.**



Promotion FRM

FRM promotion processes should support the on-going development of FRM, the continuous improvement of its overall performance.

- **Training programmes** for:
 - Management
 - Flight and Cabin Crew
 - Crew Planners
- **Effective communication plan**
 - Explanation of FRM policies, procedures, responsibilities
 - Describe communication



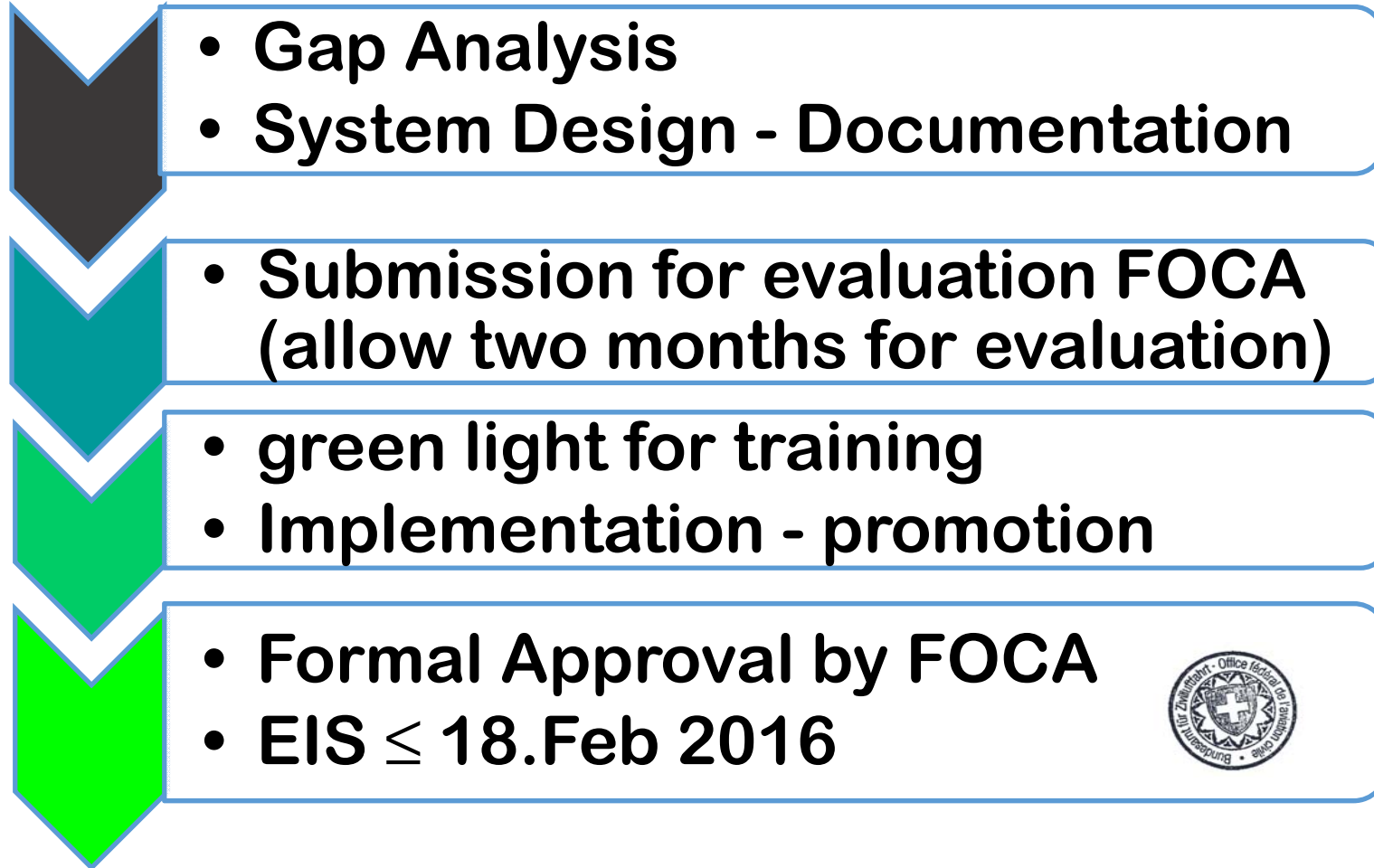
Implementation plan

Define needs, produce a **gap analysis** to the existing OMS and develop a documentation including

- adopt processes and procedures,
- declare accountabilities,
- establish FRM policy and objectives
- declare responsibilities, authorities
- describe how and which data will be collected including action plans for corrective measures
- start promotion for all crew concerned
- start training



Certification with FOCA SBOC





FRM, what else?

The operator may use the organisation management System to deal with items not requiring an FRM.

Sep 2013	Oct 2013	Nov 2013	Dec 2013	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014	Name									
S.89	S.90	S.91	S.92	S.93	S.94	S.95	S.96	S.97	S.98	S.99	S.100	S.101	S.102	S.103	S.104	S.105	S.106	Page 1, Records: 1 to
ENA.910070 (910070)					ENA.960247 (960247)													ENB On Leave
ENBA.000026 (000026)					ENBA.850280 (850280)													ENBA.1201
ENC.860083 (860083)																		ENBA.0400
ENC.130109 (130109)																		ENB.04008
ENA.910177 (910177)																		ENB.10007
																		ENBA.0401
																		ENB.00011
																		ENB.0901
																		ENB.0801
																		ENBA.021
																		ENBA.84
																		ENBA.01
																		ENB.111
																		ENB.09
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																		ENBA
																		ENB



FRM, what else? I.

Operators responsibilities when dealing with fatigue

flight duty **periods should be planned to enable crew to remain free from fatigue** to allow them operating at a satisfactory level of safety under all circumstances; (ORO.FTL.110 (b))

take into account frequency, pattern of duty and rest periods and **consider cumulative effects** of long duty hours with combined minimum rest periods (ORO.FTL.110 (d))



FRM, what else? II

Operators responsibilities dealing with fatigue

- Duty patterns shall **avoid serious disruption** of an established sleep/work pattern, such as alternating day/night duties; (ORO.FTL.110 (e))
- Rest periods should allow crew members to overcome the effects** of the previous duties and to be rested for the following duty (ORO.FTL.110 (g).)



Fatigue management training

No matter whether FRM is implemented,

Fatigue Management Training is required

for all

- crew members,
- personnel responsible for preparation and maintenance of crew rosters
- management personnel concerned.

(EU)No 83/2014 ORO.FTL.250



Training on fatigue

- All crew members undergo **Fatigue Management education and awareness training** - AMC1 ORO.FTL.250.
- The Operator shall train its crew on their specific fatigue risks and the operator's processes for reporting fatigue. (AMC1 ORO.GEN.200(a)(4))



Training on fatigue

Management personnel concerned with crew scheduling have received appropriate fatigue awareness and countermeasures training (ORO.FTL.250)

The **initial and recurrent** training syllabus is suitable for the purpose intended (ORO.FTL.250(a))

The Operator should define how often recurrent training will take place. (ORO.FTL.250(a))

Training records must be stored

(AMC1 ORO.GEN.200(a)(4) &(6))



The checklist used by FOCA

ICAO DOC 9966 Appendix C FRMS Evaluation Form

Appendix C. Example of an FRMS evaluation form

TO BE COMPLETED AND SIGNED FOR BY THE SAFETY MANAGER OR ACCOUNTABLE EXECUTIVE

Organization: _____

Signature: _____ Approval reference: _____

Print name: _____ Position: _____

FRMS Manual revision: _____ Date of signing: _____

FOR AUTHORITY USE ONLY

Staff name: _____

Signature: _____

Date of assessment: _____

0. GENERAL ISSUES AND FRMS IMPLEMENTATION

FRMS Scope and Implementation
The Organization should define the scope of the use of FRMS within its operation. In establishing an FRMS a GAP analysis should be carried out and an implementation plan that will address how the organization will transition to a fully functioning and effective FRMS.

	In place ¹	Documented ² reference:	How is it achieved? ³	Inspector's assessment remarks ⁴
0.1 In respect of the management system, have the structure, activities and scope of the FRMS operations been defined?				
0.2 Does the FRMS correspond to the size, nature and complexity of the operation and the hazards and associated risks inherent with its activities?				
0.3 Has a gap analysis been carried out?				



Q & A

Thank you for your attention.