



ICAO

SAFETY

Fatigue Management for Flight Crew: Evolving ideas

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Overview

- Fatigue management **approaches**
- Fatigue management **SARPs** for flight and cabin crew
 - FTL regulations
 - FRMS regulations
- **Implications** for:
 - Regulators
 - Operators
- Available **guidance** and future developments



Fatigue

- Normal physiological response
- Can't be eliminated, must be managed





ICAO definition

- **Fatigue.** *A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to adequately perform safety-related operational duties.*



Approaches to fatigue management

1. Prescriptive flight and duty time limitations

- Identified by State
- One-size fits all – addresses generic fatigue risks
- Safety “line-in-sand”

2. Fatigue Risk Management System (FRMS)

- Limits identified through operator’s FRMS processes - may exceed regulated limits
- Addresses specific fatigue risks in the operations to which it is applied
- Continually evaluated and updated



Fatigue management provisions

- **Annex 6 Part 1 – flight and cabin crew**
 - Standards and Recommended Practices (SARPs)
 - Guidance for development of FRMS regulations
- **FRMS Guidance**
 - Operators
 - Regulators





FM SARP: Flight and Cabin Crew



The State:

- Must have regulations for managing fatigue based on scientific principles and knowledge.



Scientific principles and knowledge

- The need for adequate **sleep**;
- **Recovery** from sleep loss;
- **Circadian** effects on sleep and performance;
- The contribution of **workload**
- The operational **context**





FM SARP: Flight and Cabin Crew



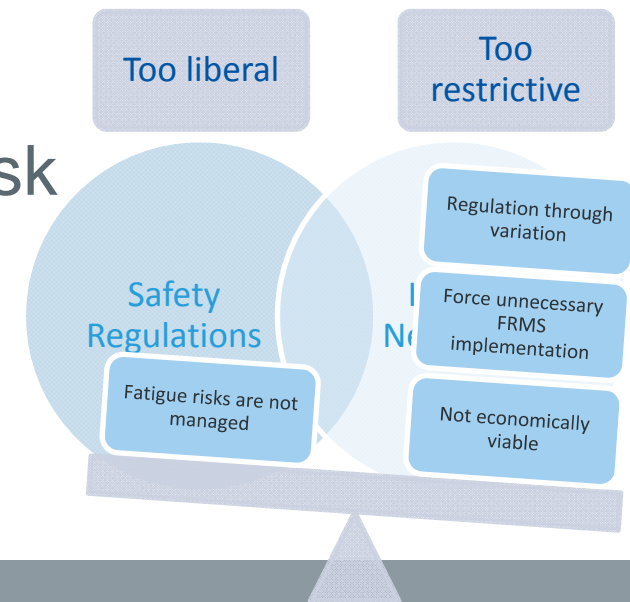
The State:

- Must have flight and duty time limitation (FDTL) regulations
- FRMS regulations are optional



Establishing FDTL regulations

- No “correct” limits, just informed boundaries
 - ICAO Standards do not identify the actual limits
 - Nor does science!
 - Identifying FDTLs requires a risk assessment
 - The focus is on safety





Establishing FDTL regulations

- Establishing prescriptive limitation regulations takes time
 - Integrated “limitation packages”
 - Limits vary according to:
 - Different conditions
 - Other prescribed limits
 - Consultation with stakeholders





Establishing FDTL regulations

- FTL regulations should allow limited flexibility
 - Exceptional circumstances
 - Unexpected (tactical)
 - Expected (strategic)
 - Based on risk assessment





Deciding to offer FRMS regulations

- Not every State should have FRMS regulations
 - Does our industry sector want or need them?
 - Are our current FDTL regulations based on science?
 - Do we have enough experience in overseeing risk-based approaches (e.g. SMS)?
 - Do current legal protections support adequate data collection?
 - Do we have adequate resources?



FM SARP: Flight and Cabin Crew



The Operator:

Where FRMS regulations are offered, can choose how to **manage their fatigue risks**

- Comply with prescriptive limitations; or
- Implement an FRMS for all operations; or
- Implement an FRMS for some operations and comply with prescriptive limitations for the remainder of the operations.



Managing fatigue risks

Comply with FDTLs

- Limits not treated as targets
- Develop schedules (routes and pairings) that consider scientific principles
- Use existing SMS processes to manage risks (including fatigue)

Implement FRMS

- Operator monitors and manages the actual fatigue risk in their operations and identifies limits through FRMS processes.
- Fatigue risks managed within agreed safety objectives and targets.
- Additional requirements above SMS minima.



Complying with FDTL requirements

- A prescriptive approach to FM is not just about limits
 - Limitations and scheduling practices
 - Variation process requirements
 - SMS requirements
 - Identify risks
 - Mitigate
 - Train



The “extra” FRMS requirements

- Specific and more comprehensive fatigue monitoring

Prescriptive limitations

- Planned vs Actual
 - Compliance
- Hazard (Safety) Reports

FRMS

- Planned vs Actual
 - SPIs
- Fatigue reports
- Retrospective surveys
- Physiological measures
- Sleep diaries
- Actigraphy
- Polysomnography
- Performance tests
- Workload rating scales



The “extra” FRMS requirements

- Specific fatigue management policies and procedures

Prescriptive limitations

- SMS recognises fatigue as a hazard to be managed
- Duty time limits and non-duty time minimums and scheduling rules documented in operations manual.

FRMS

- Specific FRMS policy
- FRMS documentation describes processes, outputs and training records.
 - Specific fatigue report procedures and documentation.
 - decisions and actions made in response to fatigue hazards detected by the FRMS.
- Communication with SMS group
- FSAG TORs



The “extra” FRMS requirements

- More comprehensive fatigue management training and communications

Prescriptive limitations

- Operator keeps safety training records..
- Safety training includes awareness of basic fatigue management principles and policies regarding fatigue management.
- Duty time limits and non-duty time minimums and scheduling rules documented in operations manual.

FRMS

- Operator keeps safety training records.
- Training programmes are established for all stakeholders, and include recurrent training.
- Training includes fatigue management specific to how the FRMS works and roles of the various stakeholders.
- The effectiveness of the FRMS training programme is assessed.
- Fatigue issues and outcomes are communicated to stakeholders.
- Duty time limits and non-duty time minimums and scheduling rules documented in operations manual..



Deciding to implement FRMS

- Not every operator should have an FRMS
 - Is FRMS available to us?
 - Do we need it?
 - Do we have effective safety reporting?
 - Do we have SMS processes that work?
 - Can we access the necessary scientific assistance?
 - Do we have a champion?



Deciding to implement FRMS

- An FRMS must be fully functioning before it can be approved
 - An FRMS takes time and resources to develop
 - The approval process requires regular communication with the regulator
 - Approval can be withdrawn
 - Prescriptive FDTLs are the backup



GUIDANCE AND FUTURE DEVELOPMENTS



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Fatigue Management

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Fatigue Management

Welcome to the ICAO Fatigue Management Site

ICAO is working to provide States and industry with provisions that will help them to better manage fatigue-related risks. We'll be continuing to develop this site and build up our bank of tools and information for your use.

FATIGUE MANAGEMENT



www.icao.int/safety/fatiguemanagement

- Resources
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ICAO Standards and Recommended Practices - Fatigue Management

Annex 6 Part 1
(Flight & Cabin Crew)
(Amendment 37)

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Fatigue Management Guidance Material

DOC 9966: FRMS Manual
for Regulators
(1st Edition, 2012)

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FRMS Implementation Guide
for Operators
(1st Edition, July 2011)

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Guidance Material for the
Development of Prescriptive



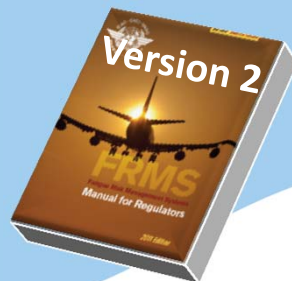
Fatigue management – future developments

- **Q4 2015** - Provisions for GA (Annex 6, Part II)
 - **Q3 2015**
 - 2nd Edition Doc 9966
 - Revised Flight and Cabin Crew guidance manuals.
 - **Q2 2016** - Fatigue Management Symposium, ICAO.
 - **Q4 2015** - Provisions for ATCs (Annex 11)
- 
- A stylized illustration of a black asphalt road with white dashed lines, curving through a white background. Several orange and white traffic cones are placed along the road, leading the eye from the foreground towards the horizon.



A suite of FM Manuals

Manual for the Oversight of
Fatigue Management
Approaches
(Doc. 9966)



Fatigue Management for
Operators
ICAO/IATA/IFALPA



Annex 6
Part I

Fatigue Management for GA
Operators

Annex 6
Part II

Fatigue Management for Air
Traffic Service Providers

Annex 11



Take home message





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(APAC) Office
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Thank You