Fatigue Management for Flight Crew: Evolving ideas

Dr Michelle Millar
Technical Officer, Human Performance
Overview

- Fatigue management approaches
- Fatigue management SARP(s) 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 FDTL regulations

- FRMS Guidance
  - Operators
  - Regulators
FM SARPs: 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 SARPs: 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 SARPs: 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
www.icao.int/safety/fatiguemanagement

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.
www.icao.int/safety/fatiguemanagement

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**ICAO Standards and Recommended Practices - Fatigue Management**

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

**Fatigue Management Guidance Material**

DOC 9966: FRMS Manual for Regulators  

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

Guidance Material for the Development of Prescriptive
Fatigue management – future developments

- **Q2 2016** - Fatigue Management Symposium, ICAO.
- **Q4 2015** - Provisions for GA (Annex 6, Part II)
- **Q3 2015**
  - 2nd Edition Doc 9966
  - Revised Flight and Cabin Crew guidance manuals.
- **Q4 2015** - Provisions for ATCs (Annex 11)
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

Prescriptive limitations

FRMS
Thank You