ICAO SAFETY

Exploring the IATA/ICAO/IFALPA FMG 2nd Edition

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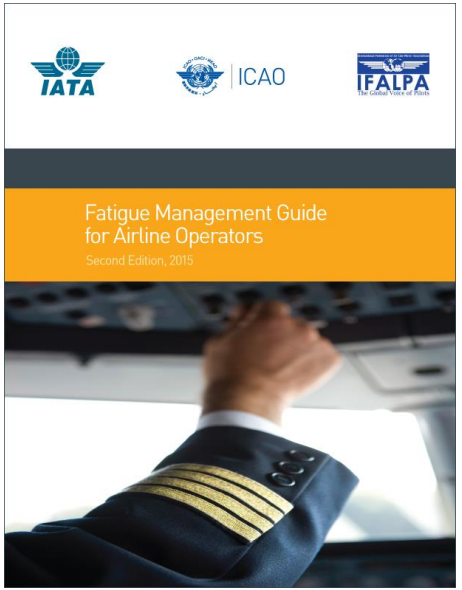
Overview

- Why revise it?
- What's new?
- How to use it?



Why revision 2?

- SMS in a prescriptive FM approach
- FRMS implementation experience
- Response to feedback

Different structure, additional information, clearer processes

WHAT'S NEW?

Scientific Principles

- FM based on scientific principles - what are they?
- Reflect the ICAO definition of fatigue.

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.*

Scientific Principles

- What are they?
- Reflect the ICAO definition of fatigue.

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Differentiating between FM approaches

- Comparative table
  - Operator / Regulator

Table 1-1. Comparison of key characteristics of prescriptive and FRMS fatigue management approaches

		PRESCRIPTIVE APPROACH	FRMS APPROACH
AIM	Regulator	• Regulator ensures that the Service Provider is managing their fatigue risks to a level acceptable to the State.	• Regulator ensures that the Service Provider is managing their fatigue risks to a level equivalent to, or better than, a prescriptive approach.
	Service Provider	• Service Provider manages fatigue risks within constraints of prescribed limits using existing SMS processes.	• Service Provider identifies their limits, manages their fatigue risks within agreed safety objectives and targets, and monitors them through their FRMS processes. These are continually assessed and may be altered as a result of FRMS experience.
POLICY & DOCUMENTATION	Regulator	• Regulator sets the regulations for prescriptive limits and Service Provider obligations. The prescriptive limits are intended to be outer limits, not targets.	• Regulator establishes FRMS regulations and develops processes for approval and oversight of FRMS.
	Service Provider	• Service Provider's SMS policy includes fatigue as a hazard to be managed. • Service Provider documents duty time limits and non-duty time minimums in their operations manual. • Service Provider maintains records of planned and actual working times.	• Service Provider has specific FRMS policy signed by the accountable executive. • Service Provider's policy defines maximum work periods and minimum non-work periods for each operation covered by the FRMS. These limits may be altered by agreement with the Regulator as a result of FRMS experience. • Service Provider develops full FRMS documentation including description of processes, outputs and training records. • Service Provider develops specific fatigue report procedures and documentation. • Service Provider documents decisions and actions made in response to fatigue hazards detected by the FRMS. • Service Provider maintains records of planned and actual working times.
VAGEMENT PROCESSES	Regulator	• Regulator identifies generic fatigue hazards within an operational context. • Regulator makes risk assessment based on generic information (scientific principles, literature reviews, best practices). • Regulator identifies prescriptive limits.	• Regulator reviews and approves the Service Provider's maximum work periods and minimum non-work periods for each part of their operations covered by the FRMS. • Regulator reviews and approves the Service Provider's processes for fatigue hazard identification, risk assessment and mitigation.
	Service Provider	• Service Provider identifies fatigue hazards mainly through reactive processes, including data collected	• Service Provider identifies maximum work periods and minimum non-work periods for each part of their

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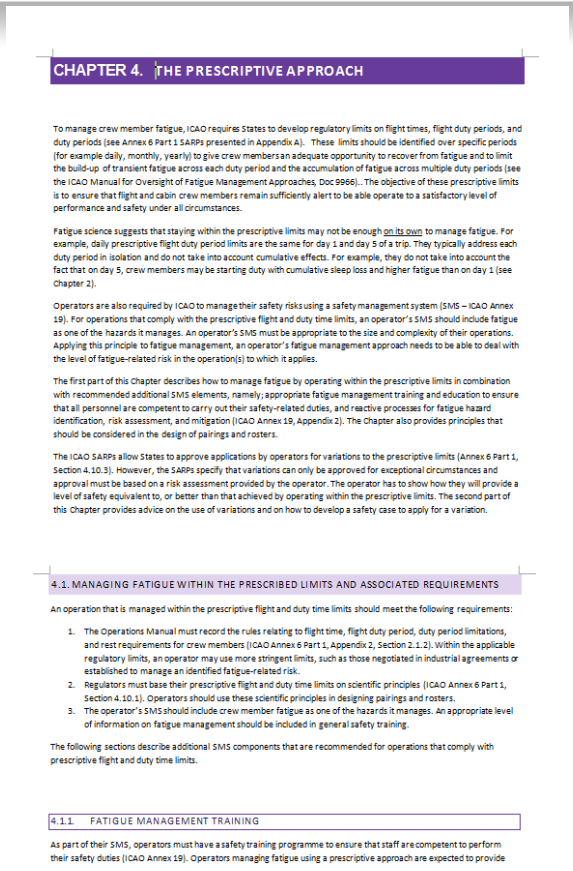
- New Chapter
  - The Prescriptive Approach



CHAPTER 4. THE PRESCRIPTIVE APPROACH

To manage crew member fatigue, ICAO requires States to develop regulatory limits on flight times, flight duty periods, and duty periods (see Annex 6 Part 1 SARPs presented in Appendix A). These limits should be identified over specific periods (for example daily, monthly, yearly) to give crew members an adequate opportunity to recover from fatigue and to limit the build-up of transient fatigue across each duty period and the accumulation of fatigue across multiple duty periods (see the ICAO Manual for Oversight of Fatigue Management Approaches, Doc 9966).. The objective of these prescriptive limits is to ensure that flight and cabin crew members remain sufficiently alert to be able operate to a satisfactory level of performance and safety under all circumstances.

Fatigue science suggests that staying within the prescriptive limits may not be enough on its own to manage fatigue. For example, daily prescriptive flight duty period limits are the same for day 1 and day 5 of a trip. They typically address each duty period in isolation and do not take into account cumulative effects. For example, they do not take into account the fact that on day 5, crew members may be starting duty with cumulative sleep loss and higher fatigue than on day 1 (see Chapter 2).

Operators are also required by ICAO to manage their safety risks using a safety management system (SMS – ICAO Annex 19). For operations that comply with the prescriptive flight and duty time limits, an operator's SMS should include fatigue as one of the hazards it manages. An operator's SMS must be appropriate to the size and complexity of their operations. Applying this principle to fatigue management, an operator's fatigue management approach needs to be able to deal with the level of fatigue-related risk in the operation(s) to which it applies.

The first part of this Chapter describes how to manage fatigue by operating within the prescriptive limits in combination with recommended additional SMS elements, namely; appropriate fatigue management training and education to ensure that all personnel are competent to carry out their safety-related duties, and reactive processes for fatigue hazard identification, risk assessment, and mitigation (ICAO Annex 19, Appendix 2). The Chapter also provides principles that should be considered in the design of pairings and rosters.

The ICAO SARPs allow States to approve applications by operators for variations to the prescriptive limits (Annex 6 Part 1, Section 4.10.3). However, the SARPs specify that variations can only be approved for exceptional circumstances and approval must be based on a risk assessment provided by the operator. The operator has to show how they will provide a level of safety equivalent to, or better than that achieved by operating within the prescriptive limits. The second part of this Chapter provides advice on the use of variations and on how to develop a safety case to apply for a variation.

4.1. MANAGING FATIGUE WITHIN THE PRESCRIBED LIMITS AND ASSOCIATED REQUIREMENTS

An operation that is managed within the prescriptive flight and duty time limits should meet the following requirements:

1. The Operations Manual must record the rules relating to flight time, flight duty period, duty period limitations, and rest requirements for crew members (ICAO Annex 6 Part 1, Appendix 2, Section 2.1.2). Within the applicable regulatory limits, an operator may use more stringent limits, such as those negotiated in industrial agreements or established to manage an identified fatigue-related risk.
2. Regulators must base their prescriptive flight and duty time limits on scientific principles (ICAO Annex 6 Part 1, Section 4.10.1). Operators should use these scientific principles in designing pairings and rosters.
3. The operator's SMS should include crew member fatigue as one of the hazards it manages. An appropriate level of information on fatigue management should be included in general safety training.

The following sections describe additional SMS components that are recommended for operations that comply with prescriptive flight and duty time limits.

4.1.1. FATIGUE MANAGEMENT TRAINING

As part of their SMS, operators must have a safety training programme to ensure that staff are competent to perform their safety duties (ICAO Annex 19). Operators managing fatigue using a prescriptive approach are expected to provide

Differentiating between FM approaches

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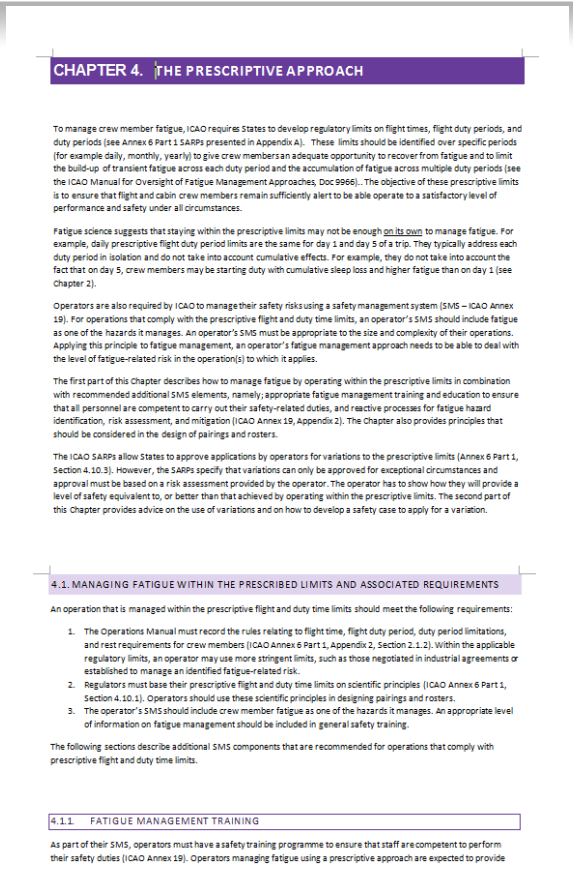

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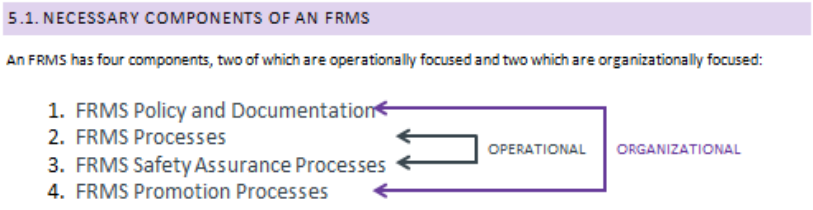
- Expanded FRMS information
  - Ch 5. FRMS: Operational Components
  - Ch 6. FRMS: Organizational Components



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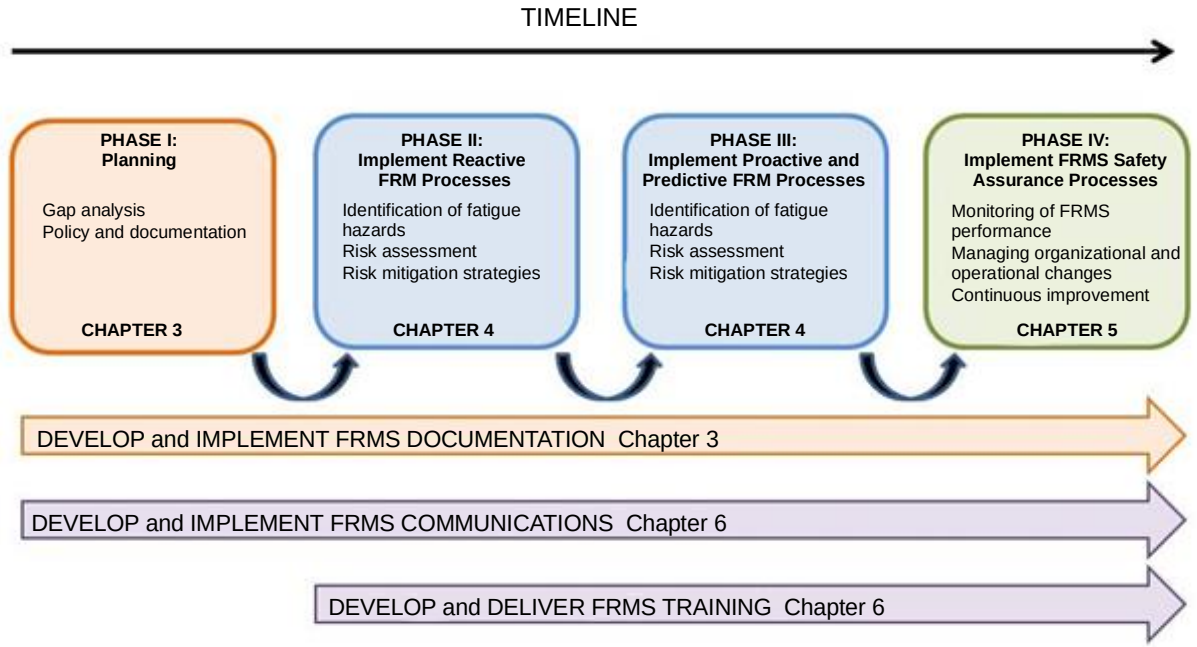
  - Ch 7. FRMS: Implementation

Table 7-1. Aims of the airline operator and the regulator during the 4 phases of FRMS implementation

		Airline Operator	Regulator
Approval process	Phase 1. Preparation	Developing FRMS capability	Assessment of feasibility
	Phase 2. Trial	Validating their FRMS capability	Assessment of FRMS capability
	Phase 3. Launch	Getting approval	Approval of FRMS
Continued oversight	Phase 4. Continuous Improvement	Embedding FRMS into normal operations	Embedding FRMS into normal regulatory oversight

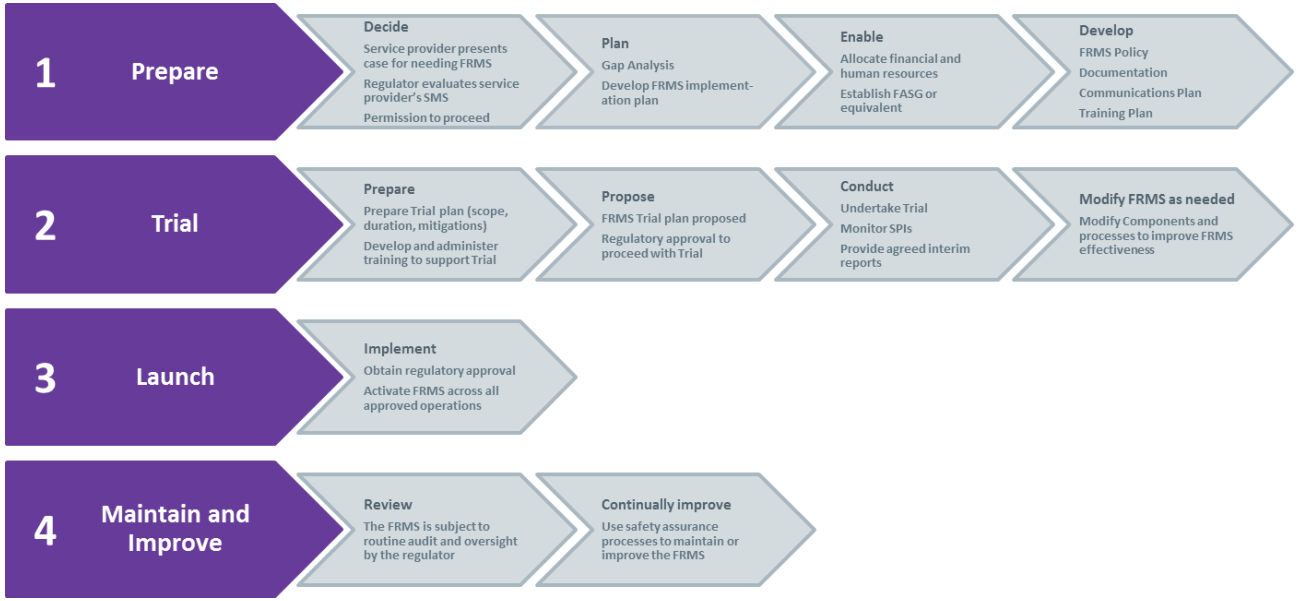
FRMS implementation diagram:

- 1st edition



FRMS implementation diagram:

- 1st edition
- 2nd edition



Part of a set of FM manuals

PHILOSOPHY OF DESIGN AND USAGE

Use by airline operators

Use by regulators

Alignment

Doc. 9966

Fatigue management in general

- Ch 1. Introduction to Fatigue Management
- Ch 2. The Scientific Principles for Fatigue Management
- Ch 3. Operational Knowledge and Experience

The prescriptive approach

- Ch 4. The Prescriptive Approach

The FRMS approach

- Ch 5. FRMS: Necessary Components
- Ch 6. FRMS: Implementation

FMG for Airline Operators

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The prescriptive approach

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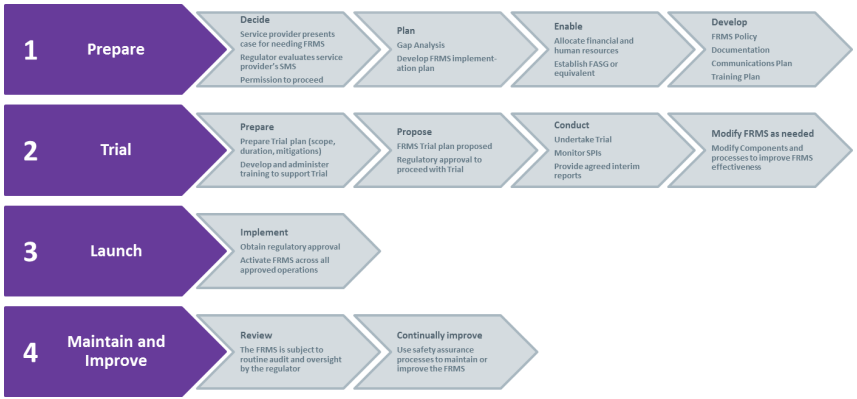
The FRMS approach

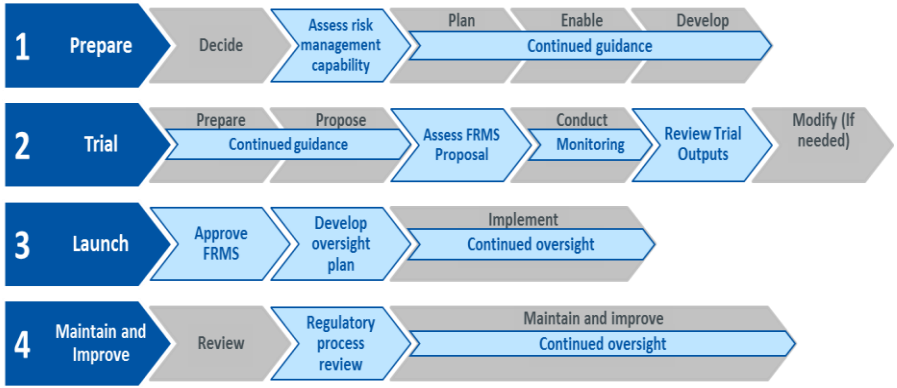
- Ch 5. FRMS: Operational Components
- Ch 6. FRMS: Organizational Components
- Ch 7. FRMS: Implementation

Example of alignment

FMG for Airline Operators



Oversight of FM Approaches (Doc. 9966)

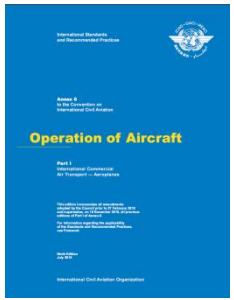


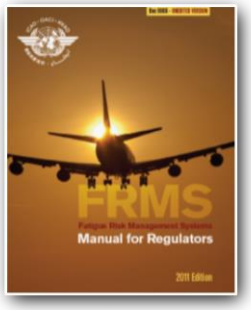
Benefits

- Multiple industry sectors, common language and understanding of concepts
- Implementation differences recognised
- FM guidance all “in one place” and available to all

FM Guidance for Regulators

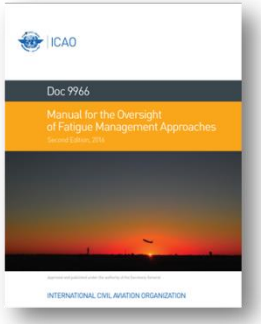
Previously





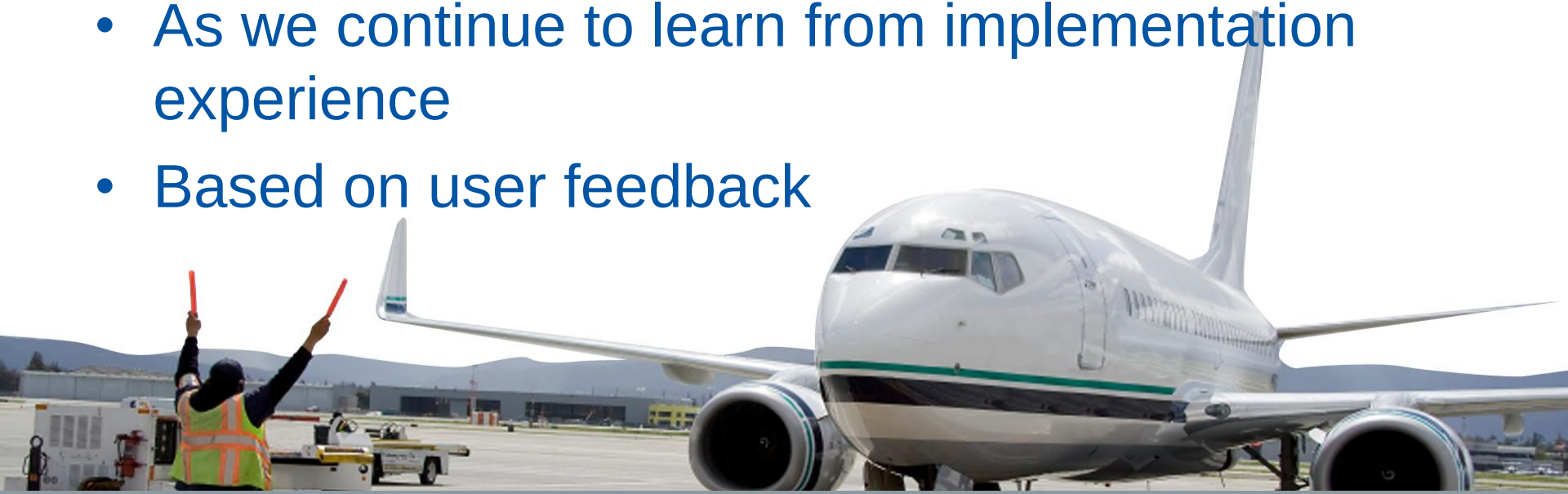
Attachment A. Guidance Material for Development of Prescriptive Fatigue Management Regulations

Now



Further updates?

- As we continue to learn from implementation experience
- Based on user feedback



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THANK YOU