



Flight and Duty Time Limitations and Rest Requirements

Fatigue Risk Management

From JARs to IRs: Air Operations

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➤ **I. The Basis**

- ★ **ICAO Annex 6 Part I, II and III**
- ★ **ICAO FRMS Guidance Material**
- ★ **Basic Regulation 216/2008**
- ★ **EU OPS Subpart Q**

➤ **II. The Concept**

- ★ **Fatigue Management**
- ★ **Implementing Rules**
- ★ **Certification Specifications**



The Basis – ICAO

➤ Annex 6 Part I

★ Definitions

➔ **Duty, Duty Period, Fatigue, Rest Period**

➔ **FDP:** ... commences when a crew member is required to report for duty ... and which finishes when the aeroplane finally comes to rest and the engines are shut down at the end of the last flight ...

★ Fatigue management

➔ Operator shall establish flight time and duty period limitations and a rest scheme ... to manage fatigue

➔ variations require equivalent level of safety



The Basis – ICAO

➤ Annex 6 Part I

★ **Fatigue management**

- State ... specify the limitations applicable to the flight time, flight duty periods, duty periods and rest periods for flight crew
- shall be based upon scientific principles and knowledge, where available ...

★ **Fatigue risk management systems**

- FRMS ... may provide an alternative approach to fatigue management
- FRMS ... does not preclude ... mandating a prescriptive fatigue management regulation as the primary means of compliance until an alternative system is established ...



The Basis – ICAO

➤ Annex 6 Part III – Commercial Air Transport

★ **Flight time, flight duty periods and rest periods**

- An operator shall formulate rules to limit flight time and flight duty periods and ... adequate rest periods
- State ... specify the limitations applicable to the flight time and flight duty periods for flight crew members
- regulations shall make provision for adequate rest periods and ... ensure that fatigue occurring either in a flight or successive flights or accumulated over a period of time ... does not endanger the safety of a flight.



The Basis – ICAO

- Annex 6 Part II & Part III – General Aviation
 - ★ The pilot-in-command shall be responsible ... that a flight
 - ➔ will not be commenced if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, **fatigue**, the effects of alcohol or drugs
 - ➔ will not be continued ... when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as **fatigue**, sickness, lack of oxygen



The Basis – ICAO

- Annex 6 Part III – General Aviation
(Large and Turbojet Aeroplanes)
 - ★ **Fatigue management programme**
 - ➔ an operator shall establish and implement a fatigue management programme ...
 - ➔ the programme shall address flight and duty times and be included in the operations manual



The Basis – ICAO

- **Annex 6 Part I – *Guidance Material for the development of Fatigue Risk Management Systems (FRMS)***
 - ★ **to manage transient and cumulative fatigue**
 - ★ **within safety management system**
 - ★ **to provide equivalent level of safety**
 - ★ **as component of prescriptive or alternative FTL system**



The Basis – Reg 216/2008 ERs

- All crew members (Annex IV, 7.f.):
 - ★ no crew member must allow their task achievement/decision making to deteriorate to the extent that flight safety is endangered because of the effects of fatigue
 - ★ taking into account ... fatigue accumulation, sleep deprivation, number of sectors flown, night duties or time zone changes
 - ★ rest periods must provide sufficient time ... to overcome the effects of the previous duties and to be well rested by the start of the following flight duty period



The Basis – Reg 216/2008 ERs

- **Commercial and complex aircraft operations (Annex IV, 8.b. & 8.f):**
 - ★ **limitations applicable to flight time, flight duty periods and rest periods ... specified in the operations manual**
 - ★ **fatigue management ... through a rostering system ... to address flight time, flight duty periods, duty and adapted rest periods**
 - ★ **rostering system to take into account ... number of sectors flown, time zone crossing, sleep deprivation, disruption of circadian cycles, night hours, positioning, cumulative duty time for given periods of time, sharing of allocated tasks between crew members, and ... augmented crews**



The Basis – Reg 216/2008 Art. 22

➤ Air Operation Certification

With regard to flight time limitation

- ★ **Agency to issue certification specifications**
- ★ **Initially, the implementing rules shall include all substantive provisions of Subpart Q, taking into account the latest scientific and technical evidence**
- ★ **individual schemes which are acceptable to the Agency, or on which the Commission has taken a positive decision ... shall be published**
- ★ **provisional derogations in unforeseen urgent operational circumstances or operational needs of a limited duration and non-repetitive nature, until the Agency expresses its opinion**



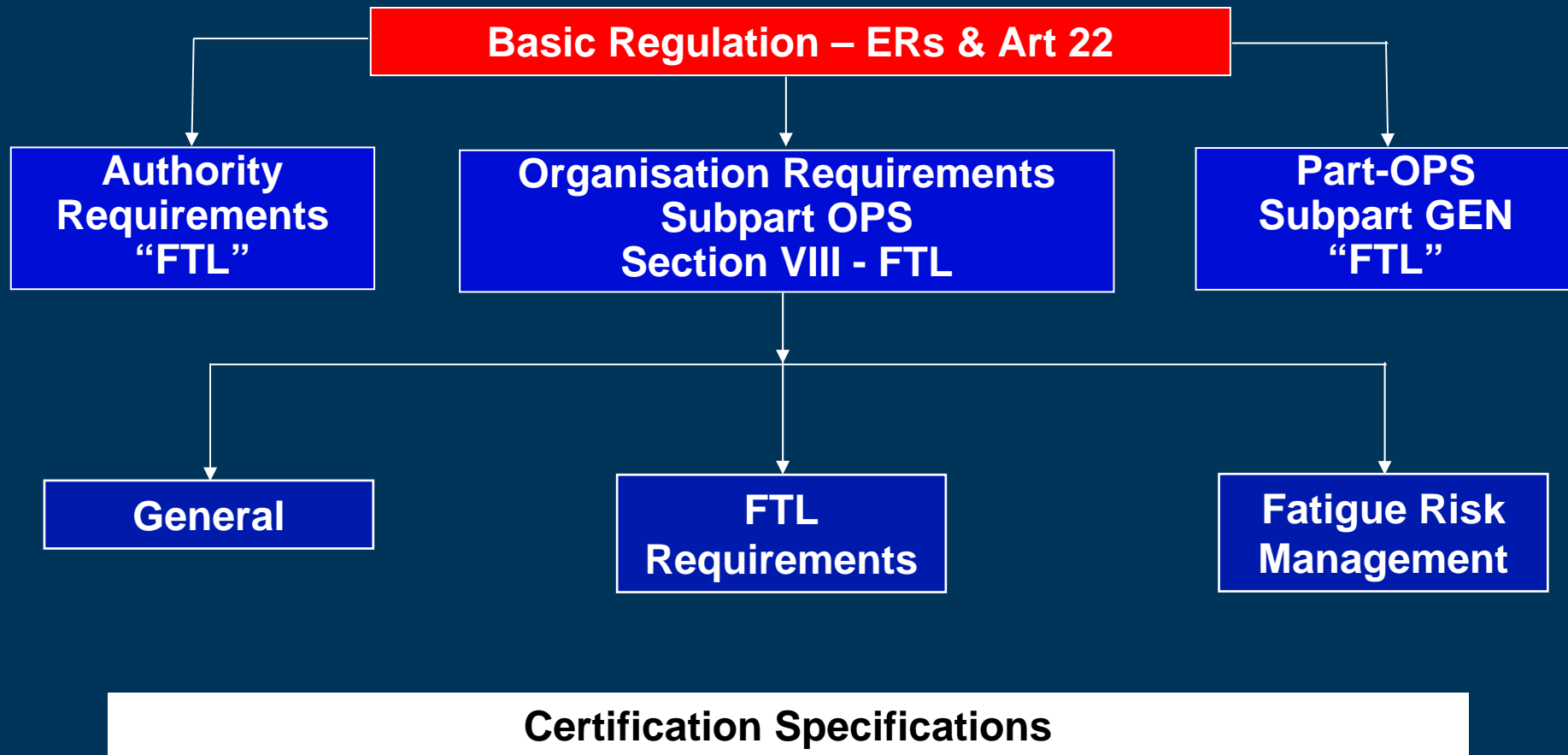
The Basis – Reg 216/2008 Art. 22

➤ Air Operation Certification

- ★ MS may approve individual flight time specification schemes
- ★ MS notify the Agency, the Commission and the other MS's that it intends to grant approval for an individual scheme
- ★ Agency shall, within one month, assess the individual scheme on the basis of a scientific and medical evaluation
- ★ Thereafter the MS may grant the approval, unless the Agency has proposed changes. Should the MS agree with these changes, it may grant the approval accordingly



The Concept





The Concept

Basic Regulation – ERs & Art 22

**Authority
Requirements
“FTL”**

**Individual FTL
Schemes**

- **Approval procedures for individual FTL schemes**
 - ★ **safety objective**
 - ★ **required documentation**
 - ★ **Notification and approval processes**



The Concept

Basic Regulation – ERs & Art 22

Part-OPS
Subpart GEN
“FTL”

➤ Crew responsibilities

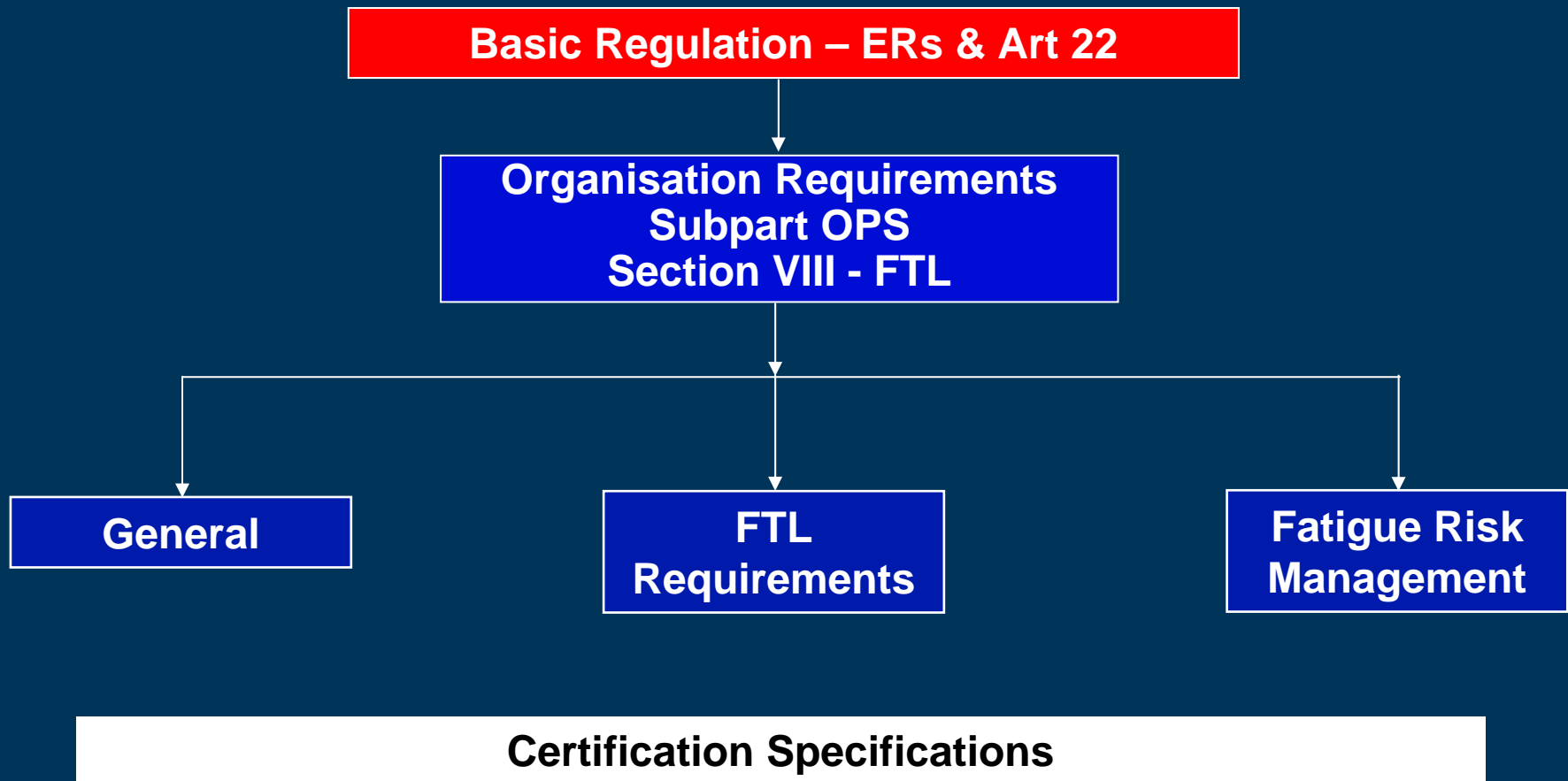
- ★ **crewmembers subject to FTL schemes of more than one operator:**

- ➔ compliance with all FTL requirements
- ➔ inform each operator
- ➔ maintain individual records

- ★ **responsibility to assess and manage level of fatigue**

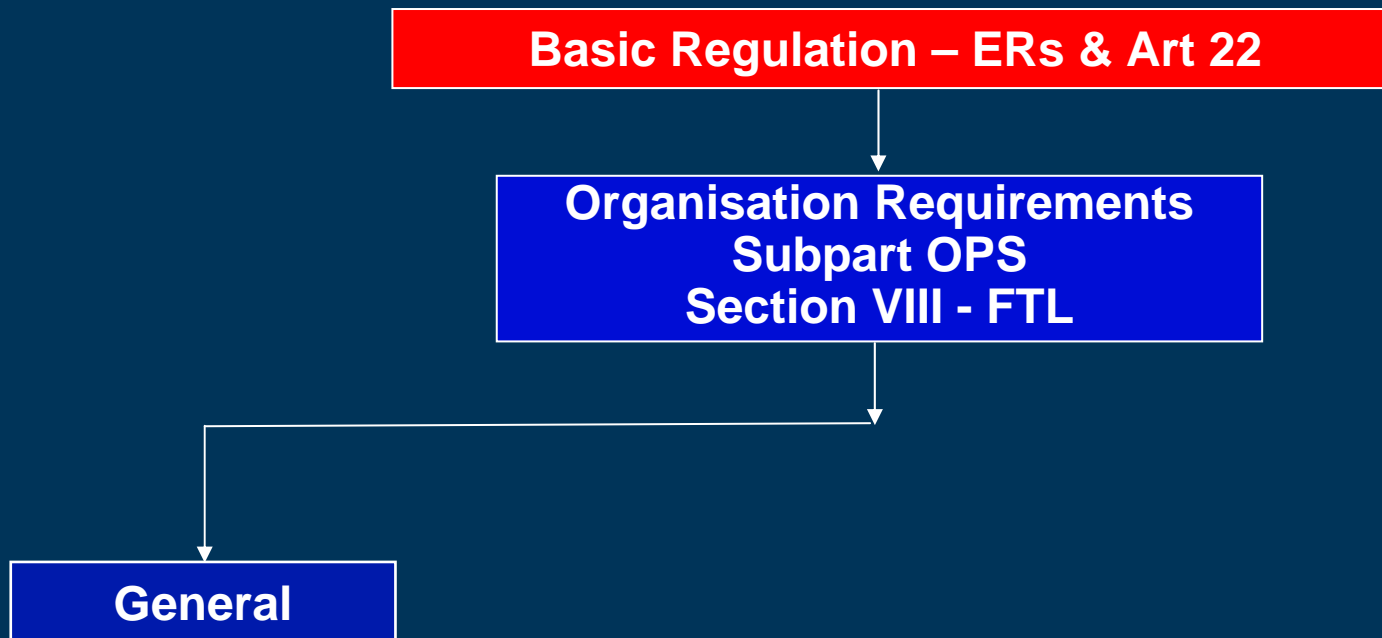


The Concept





The Concept





The Concept

General

- Definitions

- ★ augmented crew, block time, duty time, duty period, flight duty period, etc.

- Operator responsibilities

- ★ publish roster, nominate home base, specify reporting times, schedule crew members IAW FTL requirements, etc.

- FTL Records



The Concept

Basic Regulation – ERs & Art 22



**Organisation Requirements
Subpart OPS
Section VIII - FTL**



**FTL
Requirements**

Certification Specifications



The Concept

➤ **Non-commercial operators of complex aircraft:**

★ **FTL limitations part of Ops Manual**

➔ sectors, time zones, night hours, positioning, cumulative duty time, ...

★ **option to use CS or individual FTL scheme**

★ **corresponding fatigue management**

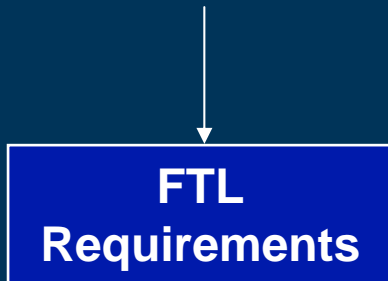
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**FTL
Requirements**



The Concept

➤ Commercial operators:

- ★ **FTL scheme part of Ops Manual**
 - ➔ CS, individual FTL scheme
- ★ **Requirements for the development of an individual FTL scheme**
 - ➔ elements
 - ➔ safety objective, assessment
- ★ **Corresponding fatigue management**





The Concept

➤ Flight Duty Period (FDP)

- ✧ **Maximum FDP**
- ✧ **Number of sectors**
- ✧ **Window of Circadian Low**
- ✧ **In-flight rest (augmentation)**
- ✧ **FDP extensions**
- ✧ **PIC discretion in unforeseen circumstances**
- ✧ **...**

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FTL

Requirements



The Concept

➤ Flight Times & Duty Periods

★ **Total duty periods**

- ➔ In any 28 consecutive days
- ➔ In any 7 consecutive days

★ **Total block time**

- ➔ In any 28 consecutive days
- ➔ In any 12 consecutive calendar months

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FTL

Requirements



The Concept

➤ Rest Periods

- ★ **Minimum rest after duty period**
- ★ **Rest away from home base**
- ★ **Compensation of time zone differences**
- ★ **Recurrent extended recovery rest periods**

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FTL

Requirements



The Concept

➤ Standby duty

★ **FTL schemes to address**

- ➔ Maximum length
- ➔ Standby followed by flight duty
- ➔ Rest following standby duty

★ **standby duty shall be rostered**

★ **requirements for airport standby duty**

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FTL

Requirements



The Concept

➤ Positioning

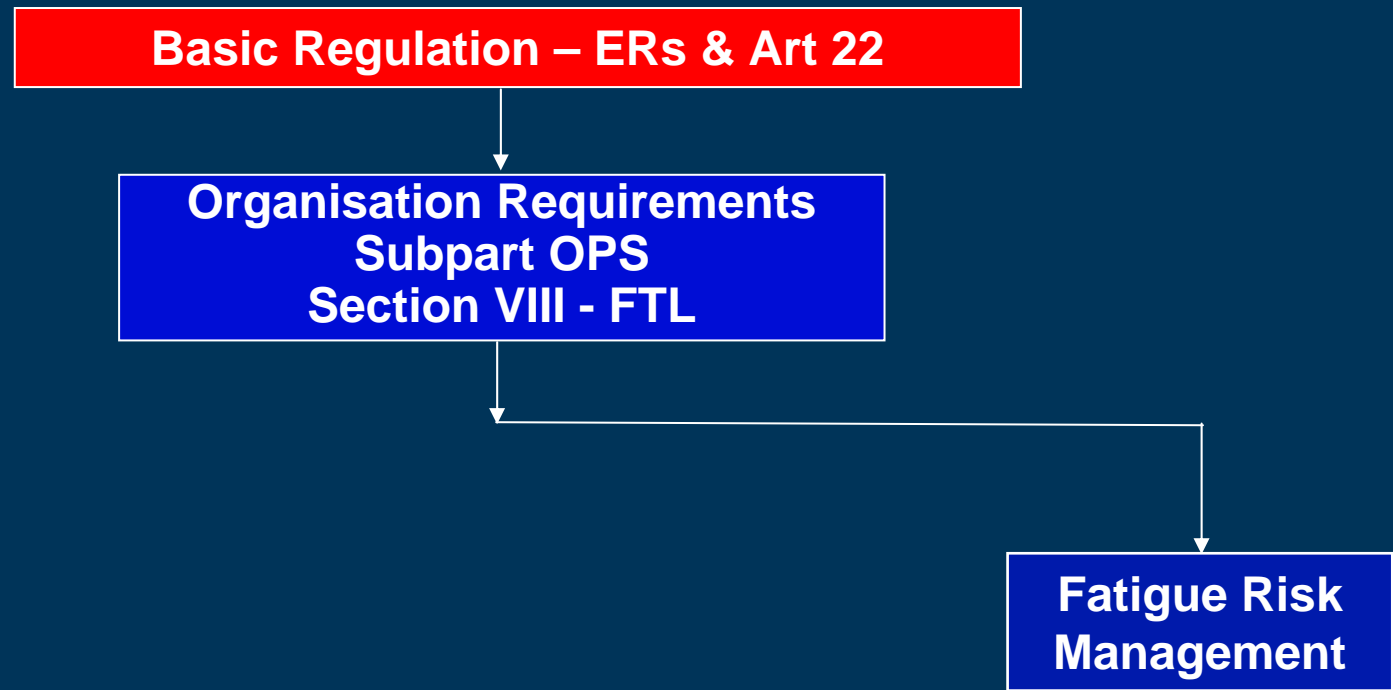
- ★ Time spent on positioning is duty time
- ★ Positioning prior to operating is part of the FDP



**FTL
Requirements**



The Concept





The Concept

➤ Fatigue Risk Management

- ★ integral part of the safety management system
- ★ correspond to the type, size and complexity of the operations & the flight time specification scheme
- ★ elements IAW ICAO guidelines for the development of a FRMS

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Fatigue Risk Management





The Concept

- **OR.GEN.200 Management System**
 - ★ **elements ...**
 - ★ **... correspond to the size, nature and complexity of the activities, and the hazards and associated risks inherent in these activities**
- **AMC**
 - ★ **organisation employing 20 or less full time equivalent (FTE): "small organisation"**
 - ★ **FTE ... shall mean not less than 35 working hours per week ...**

Fatigue Risk Management





The Concept – CSs

Certification Specifications

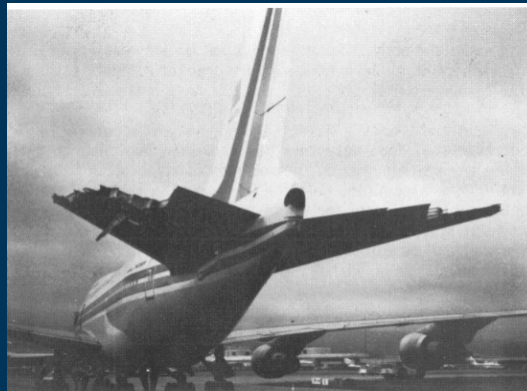
- Agency CS for Commercial Air Transport (Aeroplane)
 - ★ based on Subpart Q
 - ★ taking into account the latest scientific and technical evidence
 - ★ results from the FTL tender
- Further CSs to be developed
 - ★ air taxi, corporate, specialised heli ops, . . .
- Development/assessment of FTL schemes through framework tender



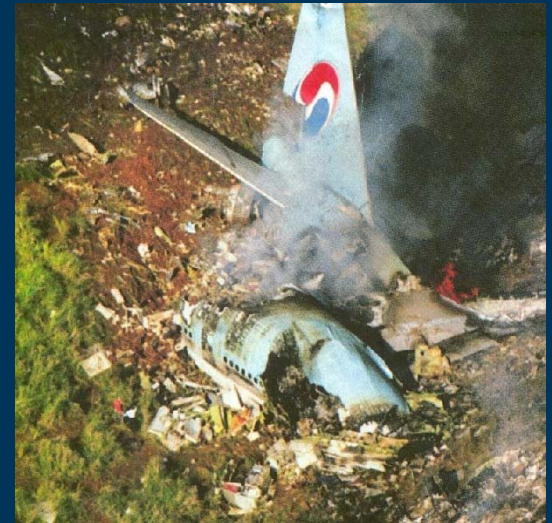
Main Cause – Fatigue



American Airlines 1420
Arkansas, 1999
11 dead



China Airlines Flight 006
Taipei – L.A., 1985
2 injured



Korea Air Flight 801
Guam, 1977
228 dead



Thank you for your attention

