**Multiple delivery methods:** Lecture and facilitated discussion, remote live streaming, and computer-based training, or any combination of methods.

**Assessment methodologies:** Facilitator assessment of appropriate level of engagement during sessions (contribution to group discussion); free-text scenario responses reflecting understanding and application of knowledge, group-based exercises of fatigue risk assessment and management, and multiple-choice recognition-type knowledge test/assessment. Overall, assessment should aim to demonstrate the integration and application of the material in the work and personal space.

The Air Operator’s Certificate (AOC) holder should assess the incorrect responses of staff as a means of: (1) evaluating the proficiency of staff; and (2) evaluating the course content and/or presentation format. Staff should be provided an opportunity to review their incorrect responses through a post-test debrief if requested. If staff need remedial training and assessment, alternative questions should be provided.

**Note:** Assessment should have questions/problems of sufficient depth to ensure participants have adequate understanding of all topics covered.

**Suggested level of competency:** An AOC holder should select a measure for demonstratingproficiency that reflects the importance of fatigue knowledge as a human factor that influences flight crew member (FCM) performance, health and wellbeing. Any such assessment should allow the FCM to show their ability to apply the topic materials within the work and home environments.

**Training materials:**

Electronic presentation media

* interactive format (e.g. Microsoft Teams / Zoom)
* Computer Based Training (CBT)
* multimedia presentations (e.g. integration of ’YouTube-like’ presentations on the topic).

Fatigue training/course materials

* Civil Aviation Order (CAO) 48.1 Instrument 2019
* Civil Aviation Advisory Publication (CAAP) 48-01 (2019)
* Operations manual fatigue rules and policies
* whiteboard / classroom materials to facilitate learning process.

**Required course content from CAO 48.1 (2019)**

**AOC training obligations Part 3, Section 15, Subsections 15.3–15.9**

Operators should tailor their training programs to include relevant topics for their own operation, for example:

* Initial training within 6 months of employment.
* Knowledge areas:

1. fatigue causes
2. fatigue impairment
3. management of fatigue risks
4. AOC risk management obligations and procedures
5. equip FCMs with ability to comply with the obligations.

* Training should integrate specific fatigue hazards encountered within the operator’s operations, fatigue oriented manual procedures, how off-duty period, flight duty period and flight time limits are related to fatigue for FCMs and staff.
* Recurrent training:
  + in accordance with syllabus
  + appropriate intervals
  + revise knowledge based on the five knowledge domains (i-v)
  + maintain a thorough knowledge based on any changes from continuous improvement in the AOC fatigue policies or procedures.
* Training records:
* Training and assessment records must be retained from the date of the record to at least 12 months after an FCM ceases employment.

# Recommended FCM fatigue training

|  |
| --- |
| Fatigue knowledge |
| Session 1 – Causes and consequences of fatigue (Module 1) |
| **1.1 What is fatigue?**   * Definitions * Types of fatigue * acute * cumulative * circadian * Quantity and quality of sleep   + sleep debt   + sleep optimisation |
| * 1. **Contributors to fatigue** * Circadian rhythms   + physical and psychological response to daily environmental cycles * Impact of quantity and quality of sleep on fatigue * Work schedules (relationships between duties; frequency, length and pattern, as well as their associated rest periods, contribute to fatigue)   + disruptive schedules   + trans-meridian flights / jet lag   + commuting for duty * Reassignment, extensions, delays and standby crew – recognising time and nature of the impact of duty changes * Type of task / task load * Work environment * Biopsychosocial (nonwork-related issues) factors   + age / health / nutrition / physical activity   + light / heat / environmental exposure   + mental health   + work-life balance (family, friends, commuting). |
| * 1. **Performance consequences of fatigue**   **Individual**   * Physical / cognitive, for example: * diminished reaction times * microsleeps * perceptual errors * compromised decision / judgment / planning * lowered concentration / memory.   **Cockpit / flight**   * Reduced productivity or performance, for example: * inaccurate flying * increased routine errors * diminished communication * increased errors of omission * diminished system management. |

|  |
| --- |
| Session 2 - Fatigue management (Module 2) |
| **2.1 Fatigue management**  Develop an understanding of the fatigue management approach including:   * Organisational fatigue risk management policies appropriate for the individual's position and duties * Fatigue risk assessments and hazards for each work group * Training and education goals * Continuous improvement of fatigue management strategies. |
| **2.2 Mutual obligations for managing fatigue**  **AOC responsibilities**  Develop an understanding of organisational processes and procedures influencing fatigue such as:   * Flight and duty time limits (including extensions and exceedances) * Evidence based rostering and recording system * Provide training and tools to assess fatigue and alertness * Management of fatigue reports (forms, assessment and feedback) * Supporting ‘just and fair’ culture, training, and fatigue awareness.   **FCM responsibilities**  Develop an awareness of obligations regarding individual fatigue management and understanding of organisational processes and procedures including:   * Use of alertness / fatigue tables or applications to inform the fatigue management system * ‘Fitness’ for duty in the context of fatigue self-management * Fatigue reporting benefits and responsibilities * Active participation in just culture. |

|  |
| --- |
| Session 3 - Fatigue hazard identification, risk and mitigation (Module 3) |
| **3.1 Hazard identification and risk assessment**   * Understand how the operator’s fatigue hazard identification procedures use reactive, proactive and predictive processes * Understand the likelihood of the identified fatigue hazards arising, the possible consequences of the hazards, and the need to report occurrences within operations * Understand how the risk assessment process establishes limits and mitigations that reduce fatigue risk to acceptable levels. |
| **3.2 Mitigations**  **AOC**   * Fatigue training and awareness * Scheduling practices * Suitable sleeping accommodation * Measuring, monitoring, feedback and management of FCM fatigue.   **FCM**  **Prior to duty**   * Management of physical and psychological health * Sleep management (measuring and monitoring) * Nutrition and hydration * Fatigue awareness and monitoring.   **During duty**   * Strategic rest and activity breaks * Controlled rest (in the cockpit) / napping * Controlled use of caffeine * Nutrition and hydration * Fatigue awareness and monitoring of self and others. |

# B – Recommended management and scheduler fatigue training

|  |
| --- |
| Fatigue knowledge |
| Session 1 – Causes and consequences of fatigue (Module 1) |
| **1.1 What is fatigue?**   * Definitions * Types of fatigue   + acute   + cumulative   + circadian. * Quantity and quality of sleep   + Sleep debt   + Sleep optimisation. |
| * 1. **Contributors to fatigue** * Circadian rhythms   + physical and psychological responses. * Impact of quantity and quality of sleep on fatigue * Work schedules (relationships between duties; frequency, length and pattern, as well as their associated rest periods, contribute to fatigue)   + disruptive schedules   + trans-meridian flights / jet lag   + commuting for duty. * Reassignment, extensions, delays and standby crew – recognising time and nature of the impact of duty changes * Type of task / task load * Work environment * Biopsychosocial (nonwork-related issues) factors   + age / health / nutrition / physical activity   + light / heat / environmental exposure   + mental health   + work-life balance (family, friends, commuting). |
| * 1. **Performance consequences of fatigue**   **Individual**   * Physical / cognitive, for example: * Diminished reaction times * Microsleeps * Perceptual errors * Compromised decision / judgment / planning * Lowered concentration / memory.   **Cockpit / flight**   * Reduced productivity or performance, for example:   + Inaccurate flying * Increased routine errors * Diminished communication * Increased errors of omission * Diminished system management. |
| Session 2 - Fatigue management (Module 2) |
| **2.1 Fatigue management**  Develop an understanding of the fatigue management approach including:   * Organisational fatigue risk management policies appropriate for the individual’s position and duties * Fatigue risk assessments and hazards for each work group * How fatigue risk can be compounded, or alleviated, depending on other associated risks (e.g. training, weather, airfield categorisation, crew experience) * Training and education goals * Continuous improvement of fatigue management strategies. |
| **2.2 Mutual obligations for managing fatigue**  **AOC responsibilities**  Develop an understanding of organisational processes and procedures influencing fatigue such as:   * Flight and duty time limits (including extensions and exceedances) * Evidence based rostering and recording system for example:   + Biomathematical modelling and / or trend analysis of scheduling * Provide training and tools to assess fatigue and alertness * Management of fatigue reports (forms, assessment and feedback) * Supporting ‘just and fair’ culture, training, and fatigue awareness.   **FCM responsibilities**   * Monitoring FCM ‘fitness for duty’ – how is the AOC ensuring that FCMs are fit when reporting for duty fit? * Assessing FCM fatigue for feedback to the scheduling system. |

|  |
| --- |
| Session 3 - Fatigue hazard identification, risk assessment and Mitigation (Module 3) |
| **3.1 Hazard identification and risk assessment**   * Understand how the operator’s fatigue hazard identification procedures use reactive, proactive and predictive processes * Understand the likelihood of the identified fatigue hazards arising, the possible consequences of the hazards, and the need to report occurrences within operations * Understand how the risk assessment process establishes limits and mitigations that reduce fatigue risk to acceptable levels. |
| **3.2 Mitigations**  Organisational   * Fatigue training and awareness * Scheduling practices * Suitable sleeping accommodation * Measuring, monitoring, feedback and management of FCM fatigue * FCM access to nutrition / hydration / caffeine / rest / activity breaks. |