

## **ANNEX A TO CD 2303AS**

### **Tabular comparison - Proposed fatigue management standards for the Part 172 MOS**

Proposed fatigue management standards	References	Explanation, comments, and notes														
<p><b>1.2.2 Definitions</b></p> <p>1.2.2.1 Unless otherwise stated, words in this MOS have the meanings given in the AIP or as follows:</p> <table border="1" data-bbox="195 443 1023 1304"> <thead> <tr> <th>Definition</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> </tr> <tr> <td>Automatic dependent surveillance — contract</td> <td>A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.</td> </tr> <tr> <td>Fatigue</td> <td>See section 4.02.</td> </tr> <tr> <td>Fatigue risk management system, or FRMS</td> <td>See section 4.02.</td> </tr> <tr> <td>Flight path monitoring</td> <td>The use of ATS surveillance systems for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path, including deviations from the terms of their air traffic control clearances.  <i>Note</i> Some applications may require a specific technology, e.g. radar, to support the function of flight path monitoring.</td> </tr> <tr> <td>...</td> <td>...</td> </tr> </tbody> </table> <p>1.2.2.2 In addition, see section 4.02 for other definitions in this instrument of words and phrases appearing in Chapter 4 (Fatigue Management).</p>	Definition	Meaning	...	...	Automatic dependent surveillance — contract	A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.	Fatigue	See section 4.02.	Fatigue risk management system, or FRMS	See section 4.02.	Flight path monitoring	The use of ATS surveillance systems for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path, including deviations from the terms of their air traffic control clearances.  <i>Note</i> Some applications may require a specific technology, e.g. radar, to support the function of flight path monitoring.	...	...		<p>Adds definitions for fatigue and FRMS and a cross-reference to other definitions in the new Chapter 4. Shaded text shows the changes in the context of the existing standards in the Part 172 MOS.</p>
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Fatigue	See section 4.02.															
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<p><b>CHAPTER 2: OPERATIONS MANUAL</b></p> <p><b>Section 2.1: General</b></p> <p><b>2.1.1 Introduction</b></p> <p>2.1.1.1 An Operations Manual shows how and where an ATS provider provides, or proposes to provide, air traffic services.</p> <p><b>2.1.2 Content of the Operations Manual</b></p> <p>2.1.2.1 An operations manual must contain:</p> <p>...</p>		<p>Adds a requirement for a provider's operations manual to include details of its FRMS. The note points to the chapter in the MOS pertaining to fatigue management (Chapter 4).</p>														

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<p>(o) a copy of the document that sets out the provider's safety management system;</p> <p>(oa) the details of the ATS provider's fatigue risk management system;</p> <p>(p) a copy of the provider's contingency plan;</p> <p>...</p> <p>(w) the procedures to be followed for revising the operations manual.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note:</b> For paragraph (oa), Chapter 4 provides for the requirement for an ATS provider to have and implement a fatigue risk management system (FRMS).</p> </div>		
<p><b>CHAPTER 6: SAFETY MANAGEMENT SYSTEM</b></p> <p><b>Section 6.1: General</b></p> <p><b>6.1.1 Features of Safety Management System</b></p> <p>6.1.1.1 A safety management system must have the following elements:</p> <p>...</p> <p>(h) the processes for the management of changes to existing services;</p> <p>(i) the processes for integrating the ATS provider's fatigue risk management system (the FRMS) into the safety management system.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note 1:</b> Guidelines for the preparation of a safety management system are published by CASA in Advisory Circular AC 172-1.</p> <p><b>Note 2:</b> For subparagraph (i), Chapter 4 provides for an ATS provider to have and implement a fatigue risk management system for the management of fatigue in its provision of air traffic services.</p> </div>		<p>Adds the requirement for a provider's SMS to include the processes for integrating the provider's fatigue risk management system (the FRMS) into its safety management system.</p>
<p><b>4.01 Scope of Chapter 4</b></p> <p>This Chapter sets out requirements for the management of fatigue in the provision of air traffic services by an ATS provider.</p> <p><b>4.02 Definitions</b></p> <p>In this instrument:</p>		<p>Chapter 4 is completely new. For ease of reference the new text in this Chapter is not highlighted.</p> <p>This table row shows the introductory text for proposed fatigue management standards.</p>
<p><b>duty</b> means any task that a person who is employed by an ATS provider as an operational person is required to carry out by the ATS provider, including tasks performed during time-in-position, administrative tasks and training.</p>	<p><b>Annex 11: Duty.</b> Any task that an air traffic controller is required by an air traffic services provider to perform. These tasks include those performed during time-in-position, administrative work and training.</p>	<p>Definition based on Annex 11.</p>

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<p><b>duty period</b> means a period of time which:</p> <ul style="list-style-type: none"> <li>(a) starts when an operational person is required by an ATS provider to report for, or commence, duties; and</li> <li>(b) ends when that person is free of all duties.</li> </ul>	<p><b>Annex 11: Duty period.</b> A period which starts when an air traffic controller is required by an air traffic services provider to report for or to commence a duty and ends when that person is free from all duties.</p>	<p>Definition based on Annex 11.</p>
<p><b>Fatigue</b>, for an operational person, means a physiological state of reduced alertness or capability to perform mental or physical tasks, which:</p> <ul style="list-style-type: none"> <li>(a) may impair the ability of the person to perform the person's safety-related duties; and</li> <li>(b) is caused by one or more of the following: <ul style="list-style-type: none"> <li>(i) the person's lack of sleep;</li> <li>(ii) the person's extended wakefulness;</li> <li>(iii) the person's circadian phase at any time;</li> <li>(iv) the person's workload of mental activities, or physical activities, or mental and physical activities at any relevant time.</li> </ul> </li> </ul>	<p><b>Annex 11: Fatigue.</b> 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 perform safety-related operational duties.</p>	<p>Definition based on Annex 11.</p>
<p><b>fatigue risk management system</b>, or <b>FRMS</b>, means a data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles, knowledge and operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.</p>	<p><b>Annex 11: Fatigue risk management system (FRMS).</b> A data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles, knowledge and operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.</p>	<p>Definition based on Annex 11.</p>
<p><b>FRMS manager</b> means the person in an ATS provider's organisation who is appointed by the chief executive officer of the organisation to be responsible for the day-to-day implementation, management and continuing effectiveness of the ATS provider's fatigue risk management system.</p>	<p><b>CAO 48.1:</b> FRMS Manager means the person in an AOC holder's organisation who is appointed by the Chief Executive Officer to be responsible for the day-to-day implementation, management and continuing effectiveness of the AOC holder's FRMS.</p>	<p>Definition based on CAO 48.1.</p>
<p><b>non-duty period</b> means a continuous and predefined period of time during which an operational person is free of all duties associated with his or her employment.</p>	<p><b>Annex 11: Non-duty period.</b> A continuous and defined period of time, subsequent to and/or prior to duty periods, during which the air traffic controller is free of all duties.</p>	<p>Definition based on Annex 11.</p>
<p><b>operational person</b>, in relation to an ATS provider, means a member of the ATS provider's personnel to whom the ATS provider gives responsibility:</p> <ul style="list-style-type: none"> <li>(a) for an air traffic control function to be performed in connection with an air traffic service it provides; or</li> <li>(b) for a flight service function to be performed in connection with an air traffic service it provides.</li> </ul> <p><i>Note</i> Under regulation 172.120 of CASR, an ATS provider must not give responsibility to a person for an air traffic control function, or a flight service function, unless the person is qualified as mentioned in that regulation or is under the supervision of a person who is qualified as mentioned.</p>	<p><b>No equivalent</b></p>	<p>Unique definition to describe – as a whole set – all air traffic controllers and flight service officers, who perform an ATS function and thus are included in the FRMS requirements.</p>
<p><b>Part 65 Manual of Standards</b> means the Manual of Standards issued by CASA under regulation 65.033 of CASR.</p> <p><i>Note</i> See the definition of <b>Manual of Standards</b> in regulation 65.010 of CASR.</p>		<p>Cross reference only.</p>
<p><b>time-in-position</b>, for an operational person, means a period of time which:</p> <ul style="list-style-type: none"> <li>(a) starts when the person starts performing an air traffic control function, or flight service function; and</li> <li>(b) ends when the person stops performing the function.</li> </ul>	<p><b>Annex 11: Time-in-position.</b> The period of time when an air traffic controller is exercising the privileges of the air traffic controller's licence at an operational position.</p>	<p>The definition uses language matching the terminology in the CASR equivalent to the ICAO term 'exercising privileges'.</p>

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<p><b>4.03 General condition on ATS provider’s approval under Subpart 172.F</b></p> <p>For the purposes of regulation 11.068 of CASR, it is a condition of the approval under Subpart 172.F of CASR, of a person as an ATS provider, that the ATS provider must:</p> <ul style="list-style-type: none"> <li>(a) comply with each requirement for the ATS provider set out in this Chapter; and</li> <li>(b) comply with the limits and requirements for an operational person, as provided for by the ATS provider’s FRMS; and</li> <li>(c) ensure that each of the ATS provider’s operational persons, when acting as such, complies with each requirement imposed by section 14.02 or 14.03 of the Part 65 Manual of Standards on the person’s ATC licence or flight service licence.</li> </ul> <p><i>Note</i> Section 14.02 of the Part 65 Manual of Standards imposes a condition on an ATC licence that requires the holder of the licence not to carry out an air traffic control function if, due to fatigue, the holder is, or is likely to, be unfit to perform the task. Section 14.03 of that Manual of Standards imposes a condition in similar terms for holders of flight service licences.</p>		<p>Regulation 11.068 empowers CASA, after the grant of an authorisation, to impose a condition on the authorisation or vary a condition of the authorisation.</p> <p>The proposed FRMS standards are introduced as a condition imposed on AA’s existing and future approvals as an ATS provider.</p>
<p><b>4.04 ATS provider’s obligations</b></p> <p>Fitness for duty</p> <ul style="list-style-type: none"> <li>(1) An ATS provider must not assign a duty to an operational person to perform an air traffic control function, or a flight service function, if the ATC provider reasonably believes that the operational person is unfit to perform the function because of fatigue.</li> </ul> <p>Limits</p> <ul style="list-style-type: none"> <li>(2) The limits and requirements that apply to an ATS provider’s operational persons must be determined in accordance with the ATS provider’s FRMS.</li> </ul>		<p>Proposed Section 4.04 sets a general restriction that prevents an ATS provider assigning a duty to an operational person if the person is likely to be fatigued.</p>
<p><b>4.05 Requirement for fatigue risk management system</b></p> <ul style="list-style-type: none"> <li>(1) An ATS provider must have a fatigue risk management system (an <b>FRMS</b>) that is appropriate for the size, nature and complexity of the ATS provider’s operations.</li> <li>(2) The FRMS must include each of the following elements: <ul style="list-style-type: none"> <li>(a) the policy and objectives, and related documentation, in accordance with section 4.07;</li> <li>(b) the practical operating procedures in accordance with section 4.08;</li> <li>(c) the hazard identification, risk assessment and mitigation processes in accordance with section 4.09;</li> <li>(d) the safety assurance procedures in accordance with section 4.10;</li> <li>(e) the safety promotion procedures in accordance with section 4.11;</li> <li>(f) the change management process in accordance with section 4.12.</li> </ul> </li> </ul> <p><i>Note</i> See also subsection 6.1.1 (about safety management systems). Paragraph 6.1.1.1 (i) requires the provider’s safety management system (SMS) to include processes for integrating the FRMS with the SMS.</p>	<p><b>Annex 11</b> 2.28.2 States shall require that the air traffic services provider, for the purposes of managing its fatigue-related safety risks, establish one of the following:</p> <ul style="list-style-type: none"> <li>a) air traffic controller schedules commensurate with the service(s) provided and in compliance with the prescriptive limitation regulations established by the State in accordance with 2.28.1 a); or</li> <li>b) an FRMS, in compliance with regulations established by the State in accordance with 2.28.1 b), for the provision of all air traffic control services; or</li> <li>c) an FRMS, in compliance with regulations established by the State in accordance with 2.28.1 b), for a defined part of its air traffic control services in conjunction with schedules in compliance with the prescriptive limitation regulations established by the State in accordance with 2.28.1 a) for the remainder of its air traffic control services.</li> </ul>	<p>Proposed Section 4.05 implements part of para 2.28.2 of Annex 11 by requiring an ATS provider to have an FRMS.</p> <p>Australia has a notified Difference (‘Not implemented’) with ICAO in relation to subparas 2.28.2 a) and 2.28.2 a) of Annex 11.</p> <p>Subsection 4.04 (2) (Integrated with SMS) reflects subpara 2.28.4 a) of Annex 11, and Subsection 1.3, Appendix 7 of CAO 48.1</p>

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<p><b>4.06 Application for approval of FRMS</b></p> <p>(1) The ATS provider may apply to CASA for:</p> <p>(a) a trial FRMS implementation approval; or</p> <p>(b) a full FRMS implementation approval.</p> <p><i>Note</i> An ATS provider is not eligible for a full implementation approval until the FRMS has been in effective operation for at least 12 months from the date of a trial implementation approval: see section 4.14.</p> <p>(2) For a trial or full FRMS implementation approval:</p> <p>(a) an FRMS must include CASA approval of each of the elements of the FRMS mentioned in subsection 4.05(2); and</p> <p>(b) CASA must be satisfied that the FRMS is integrated with the ATS provider's safety management system.</p> <p>(3) Before CASA issues a trial FRMS implementation approval, CASA must be satisfied that the FRMS:</p> <p>(a) comprises all of the elements mentioned in subsection 4.05(2); and</p> <p>(b) is a safe, data-driven system which appears to be reasonably capable of continuously and effectively monitoring and managing fatigue-related safety risks using scientific principles and knowledge, and operational experience; and</p> <p>(c) will enable the ATS provider to assess the extent to which operational persons and other relevant personnel perform at levels of alertness sufficient to ensure the safety of operations.</p> <p>(4) Before CASA issues a full implementation approval, CASA must be satisfied that the FRMS:</p> <p>(a) comprises all of the elements mentioned in subsection 4.05(2); and</p> <p>(b) is a safe, data-driven system which will continuously and effectively monitor and manage fatigue-related safety risks using scientific principles and knowledge, and operational experience; and</p> <p>(c) will enable the ATS provider to ensure that operational persons and other relevant personnel perform at levels of alertness sufficient to ensure the safety of operations.</p>	<p><b>Annex 11</b> 2.28.4 Where an air traffic services provider implements an FRMS to manage fatigue-related safety risks in the provision of part or all of its air traffic control services in accordance with 2.28.2 b), the State shall:</p> <p>b) approve an FRMS, according to a documented process, that provides a level of safety acceptable to the State.</p> <p><b>CAO 48.1:</b></p> <p><b>APPENDIX 7 FATIGUE RISK MANAGEMENT SYSTEM (FRMS)</b></p> <p><b>1 General</b></p> <p>1.1 An AOC holder may apply to CASA for:</p> <p>(a) a trial FRMS implementation approval, for all or part of its operations; or</p> <p>(b) a full FRMS implementation approval, for all or part of its operations.</p> <p><i>Note</i> An AOC holder is not eligible for a full implementation approval until the FRMS has been in effective operation for at least 12 months from the date of a trial implementation approval. See clause 9.</p> <p>1.2 For a trial or full FRMS implementation approval, an FRMS must include CASA approval of each of the following elements of the FRMS:</p> <p>(a) the policy and objectives, and related documentation, in accordance with clause 2;</p> <p>(b) the practical operating procedures in accordance with clause 3;</p> <p>(c) the hazard identification, risk assessment and mitigation procedures in accordance with clause 4;</p> <p>(d) the safety assurance procedures in accordance with clause 5;</p> <p>(e) the safety promotion procedures in accordance with clause 6;</p> <p>(f) the change management procedures in accordance with clause 7.</p> <p><i>Note 1</i> Significant changes require CASA approval. See clause 7.</p> <p><i>Note 2</i> Guidance for the development and implementation of an FRMS is available on the ICAO and CASA websites.</p> <p>1.3 If the AOC holder has an SMS, a trial or full FRMS implementation approval will not be given unless CASA is satisfied that the FRMS is integrated with the SMS.</p> <p>1.4 Before CASA issues a trial FRMS implementation approval, CASA must be satisfied that the AOC holder's FRMS:</p> <p>(a) comprises all of the elements mentioned in subclause 1.2; and</p> <p>(b) is a safe, integrated, data-driven, system which appears to be reasonably capable of continuously and effectively monitoring and managing fatigue-related safety risks using scientific principles and knowledge, and operational experience; and</p> <p>(c) will enable the AOC holder to assess the extent to which FCMS and other relevant personnel perform at levels of alertness sufficient to ensure the safety of operations.</p> <p>1.5 Before CASA issues a full FRMS implementation approval, CASA must be satisfied that the AOC holder's FRMS:</p> <p>(a) comprises all the elements mentioned in subclause 1.2; and</p> <p>(b) is a safe, integrated, data-driven, system which will continuously and effectively monitor and manage fatigue-related safety risks using scientific principles and knowledge, and operational experience; and</p>	<p>Proposed Section 4.06 reflects 2.28.4 b) of Annex 11 and Section 1 of CAO 48.1.</p>

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	(c) will enable the AOC holder to ensure that FCMs and other relevant personnel perform at levels of alertness sufficient to ensure the safety of operations.	
<p><b>4.07 FRMS policy and documentation</b></p> <p>(1) The ATS provider must have an FRMS policy that refers to all the elements of the FRMS mentioned in subsection 4.05(2).</p> <p>(2) The policy must require that all the operations to which the FRMS applies be clearly defined in the operations manual.</p> <p>(3) The policy must:</p> <ul style="list-style-type: none"> <li>(a) make it clear that while primary responsibility for the FRMS lies with the ATS provider, its effective implementation requires shared responsibility by management, operational persons, and any other relevant personnel; and</li> <li>(b) clearly indicate the safety objectives of the FRMS; and</li> <li>(c) be approved in writing by the chief executive officer of the ATS provider's organisation; and</li> <li>(d) be accessible to all relevant areas and levels of the organisation in a way that indicates the ATS provider's specific endorsement of the policy; and</li> <li>(e) declare management commitment to: <ul style="list-style-type: none"> <li>(i) effective safety reporting; and</li> <li>(ii) provision of adequate resources for the FRMS; and</li> <li>(iii) continuous improvement of the FRMS; and</li> </ul> </li> <li>(f) require that clear lines of accountability are identified for management, operational personnel, and all other relevant personnel; and</li> <li>(g) require periodic reviews to ensure the policy remains relevant and appropriate.</li> </ul>	<p><b>Appendix 6 to Annex 11:</b></p> <p><b>1. FRMS policy and documentation</b></p> <p>1.1 FRMS policy</p> <p>1.1.1 The air traffic services provider shall define its FRMS policy, with all elements of the FRMS clearly identified.</p> <p>1.1.2 The policy shall:</p> <ul style="list-style-type: none"> <li>a) define the scope of FRMS operations;</li> <li>b) reflect the shared responsibility of management, air traffic controllers, and other involved personnel;</li> <li>c) clearly state the safety objectives of the FRMS;</li> <li>d) be signed by the accountable executive of the organization;</li> <li>e) be communicated, with visible endorsement, to all the relevant areas and levels of the organization;</li> <li>f) declare management commitment to effective safety reporting;</li> <li>g) declare management commitment to the provision of adequate resources for the FRMS;</li> <li>h) declare management commitment to continuous improvement of the FRMS;</li> <li>i) require that clear lines of accountability for management, air traffic controllers, and all other involved personnel are identified; and</li> <li>j) require periodic reviews to ensure it remains relevant and appropriate.</li> </ul> <p><i>Note.— Effective safety reporting is described in the Safety Management Manual (SMM) (Doc 9859).</i></p>	<p>Proposed Section 4.07 reflects Section 1.1 of Appendix 6 to Annex 11, but using terminology from CAO 48.1.</p>
<p>(4) The policy must:</p> <ul style="list-style-type: none"> <li>(a) be in a written statement; and</li> <li>(b) require that each other element of the FRMS mentioned in subsection 4.05(2) be described in a written statement.</li> </ul> <p>(5) In addition to the requirements under subsection (4), and the relevant limits and procedures contained in the operations manual in accordance with this Chapter, the FRMS must also be supported by the following documentation, namely, up-to-date identification, description and records of the following:</p> <ul style="list-style-type: none"> <li>(a) the personnel accountabilities, responsibilities and authorities for effective implementation of the FRMS, including the FRMS Manager;</li> <li>(b) the mechanisms for ongoing involvement in fatigue risk management of management, operational personnel, and all other relevant personnel;</li> <li>(c) the FRMS training programs, training requirements and records of attendance at training;</li> <li>(d) scheduled and actual duty and non-duty periods and break periods between periods of time-in-position in a duty period with significant deviations and reasons for deviations noted;</li> <li>(e) the FRMS outputs, including findings from collected data, and recommendations and actions taken.</li> </ul> <p><i>Note</i> An ATS provider's operations manual must contain the details of the</p>	<p><b>Appendix 6 to Annex 11:</b></p> <p><b>1.2 FRMS documentation</b></p> <p>An air traffic services provider shall develop and keep current FRMS documentation that describes and records:</p> <ul style="list-style-type: none"> <li>a) FRMS policy and objectives;</li> <li>b) FRMS processes and procedures;</li> <li>c) accountabilities, responsibilities and authorities for these processes and procedures;</li> <li>d) mechanisms for ongoing involvement of management, air traffic controllers, and all other involved personnel;</li> <li>e) FRMS training programmes, training requirements and attendance records;</li> <li>f) scheduled and actual duty and non-duty periods and break periods between periods of time-in-position in a duty period with significant deviations and reasons for deviations noted; and</li> </ul> <p><i>Note.— Significant deviations are described in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).</i></p> <ul style="list-style-type: none"> <li>g) FRMS outputs including findings from collected data, recommendations, and actions taken.</li> </ul>	<p>Proposed subsections 4.07 (4)-(6) reflect Section 1.2 of Appendix 6 to Annex 11, but using terminology from CAO 48.1.</p>

Proposed fatigue management standards	References	Explanation, comments, and notes
<p>FRMS: see paragraph 2.1.2.1 (oa).</p> <p><b>4.08 FRMS practical operating procedures</b></p> <p>(1) The FRMS practical operating procedures must set out:</p> <p>(a) maximum values for each operational member for the following:</p> <ul style="list-style-type: none"> <li>(i) the number of hours in a duty period;</li> <li>(ii) the number of consecutive work days;</li> <li>(iii) the number of hours worked in a defined period;</li> <li>(iv) the time in position in a duty period; and</li> </ul> <p>(b) minimum values for each operational person for the following:</p> <ul style="list-style-type: none"> <li>(i) the duration of a non-duty period;</li> <li>(ii) the number of non-duty days required in a defined period;</li> <li>(iii) the duration of breaks between periods of time-in-position in a duty period.</li> </ul> <p><i>Note</i> The terms <b>duty period</b> and <b>non-duty period</b> are defined in section 4.02.</p> <p>(2) For the purposes of subsection (1), the values for each operational person must be based on scientific principles and knowledge and subject to safety assurance processes.</p> <p>(3) Subject to subsection (4), if an ATS provider acquires data from an FRMS which indicates that the maximum and minimum values required under paragraphs (1)(a) and (b) are too high or too low, respectively, the ATS provider must amend the FRMS to ensure that these values are acceptable.</p> <p>(4) For subsection (3), an amendment may only be made in accordance with section 4.12.</p>	<p><b>Annex 11</b> 2.28.4 Where an air traffic services provider implements an FRMS to manage fatigue-related safety risks in the provision of part or all of its air traffic control services in accordance with 2.28.2 b), the State shall:</p> <p>b) approve an FRMS, according to a documented process, that provides a level of safety acceptable to the State.</p> <p><b>ICAO Doc 9966</b> IDENTIFYING THE METHOD FOR ESTABLISHING THE BASELINE FOR THE EQUIVALENT LEVEL OF SAFETY</p> <p>In order to agree on meaningful SPIs, it is necessary to establish a baseline of safety. The baseline of safety is identified through <b>fatigue-related metrics associated with the prescriptive limitation regulations</b> under the service provider's SMS processes in specific operational circumstance (e.g. average sleep obtained in a normal non-work period in relation to average alertness and performance at the end of the safety-related work period).</p> <p>The State and the service provider will need to agree to the method used by the service provider to demonstrate an equivalent level of safety for the proposed FRMS trial operation. This will allow comparison of baseline measures of safety to those expected under the proposed FRMS limits. Possible SPIs include the average sleep achieved in the 24 hours before top of descent (in the case of pilots) or average sleep achieved in the 24 hours before a work period (in the case of air traffic controllers).</p> <p><b>CAO 48.1 Appendix 7</b></p> <p>...</p> <p>3.2 The FRMS practical operating procedures must set out:</p> <p>(a) maximum values for each FCM for the following:</p> <ul style="list-style-type: none"> <li>(i) flight times;</li> <li>(ii) flight duty periods;</li> <li>(iii) duty periods; and</li> </ul> <p>(b) minimum values for each FCM off-duty periods.</p> <p><i>Note</i> The terms <i>flight time</i>, <i>flight duty period</i>, <i>duty period</i> and <i>off-duty period</i> are defined in this CAO.</p> <p>3.3 For subclause 3.2, the values for each FCM must be based on scientific principles and knowledge and subject to safety assurance processes.</p>	<p>Proposed Section 4.08 implements subpara 2.28.4 b) of Annex 11, specifically that the FRMS, according to a documented process, provides <b>a level of safety acceptable to the State</b>.</p> <p>The specific details match the equivalent requirements of CAO 48.1 and the guidance in ICAO Doc 9966 <i>The Manual for the Oversight of Fatigue Management Approaches</i>, particularly in regards maximum duty periods and minimum non-duty periods suitable for baselining the measures of safety expected under the FRMS limits.</p>
<p><b>4.09 FRMS hazard identification, risk assessment and mitigation procedures</b></p> <p>FRMS hazard identification procedures</p> <p>(1) FRMS hazard identification procedures must be based on the following processes for fatigue-related hazard identification:</p> <ul style="list-style-type: none"> <li>(a) the predictive process;</li> <li>(b) the proactive process;</li> <li>(c) the reactive process.</li> </ul> <p>(2) The predictive process must be capable of identifying fatigue-related hazards by examining the scheduling of operational persons and taking into account the following:</p> <ul style="list-style-type: none"> <li>(a) factors known to affect sleep;</li> <li>(b) factors known to affect fatigue;</li> </ul>	<p><b>Appendix 6 to Annex 11:</b></p> <p><b>2. Fatigue risk management processes</b></p> <p>2.1 Identification of fatigue-related hazards</p> <p><i>Note.— Provisions on the protection of safety information are contained in Annex 19.</i></p> <p>An air traffic services provider shall develop and maintain three fundamental and documented processes for fatigue hazard identification:</p> <p>2.1.1 <i>Predictive</i>. The predictive process shall identify fatigue hazards by examining air traffic controller scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include, but are not limited to:</p> <ul style="list-style-type: none"> <li>a) air traffic services or industry operational experience and data collected on similar types of operations or from other industries with shift work or 24-hour operations;</li> <li>b) evidence-based scheduling practices; and</li> </ul>	<p>Proposed Section 4.09 reflects Section 2, Appendix 6 of Annex 11, but using terminology from CAO 48.1.</p>



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<p>(c) the effects of the factors mentioned in paragraphs (a) and (b) on an operational person's performance.</p> <p>(3) The proactive process must be capable of identifying fatigue-related hazards within current operations.</p> <p>(4) The reactive process must be capable of identifying the contribution of fatigue-related hazards to actual events that could have affected, or did affect, safety, with a view to determining how the effects of fatigue on each event could have been minimised.</p> <p>FRMS risk assessment procedures</p> <p>(5) FRMS risk assessment procedures must be capable of determining the following:</p> <p>(a) the probability of events occurring or circumstances arising that create a fatigue-related hazard;</p> <p>(b) the potential severity of fatigue-related hazards;</p> <p>(c) when the safety risks associated with paragraph (a) or (b) require mitigation.</p> <p>(6) For the purposes of subsection (5), the FRMS risk assessment procedures must ensure that identified fatigue-related hazards are examined in relation to the following:</p> <p>(a) the relevant operational context and procedures in which the identified fatigue-related hazard arose;</p> <p>(b) the probability of the fatigue-related hazard arising in those circumstances;</p> <p>(c) the possible consequences of the fatigue-related hazard in those circumstances;</p> <p>(d) the effectiveness of existing safety procedures and controls.</p> <p>FRMS risk mitigation procedures</p> <p>(7) FRMS risk mitigation procedures for each fatigue-related hazard must be capable of:</p> <p>(a) selecting appropriate mitigation strategies for the hazard; and</p> <p>(b) implementing the selected mitigation strategies; and</p> <p>(c) monitoring the implementation and effectiveness of the strategies.</p>	<p>c) bio-mathematical models.</p> <p>2.1.2 <i>Proactive</i>. The proactive process shall identify fatigue hazards within current air traffic services operations.</p> <p>Methods of examination may include, but are not limited to:</p> <p>a) self-reporting of fatigue risks;</p> <p>b) fatigue surveys;</p> <p>c) relevant air traffic controller performance data;</p> <p>d) available safety databases and scientific studies;</p> <p>e) tracking and analysis of differences in planned and actual worked times; and</p> <p>f) observations during normal operations or special evaluations.</p> <p>2.1.3 <i>Reactive</i>. The reactive process shall identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimized. At a minimum, the process may be triggered by any of the following:</p> <p>a) fatigue reports;</p> <p>b) confidential reports;</p> <p>c) audit reports; and</p> <p>d) incidents.</p> <p>2.2 Fatigue-related risk assessment</p> <p>2.2.1 An air traffic services provider shall develop and implement risk assessment procedures that determine when the associated risks require mitigation.</p> <p>2.2.2 The risk assessment procedures shall review identified fatigue hazards and link them to:</p> <p>a) operational processes;</p> <p>b) their probability;</p> <p>c) possible consequences; and</p> <p>d) the effectiveness of existing preventive controls and recovery measures.</p> <p>2.3 Risk mitigation</p> <p>An air traffic services provider shall develop and implement fatigue risk mitigation procedures that:</p> <p>a) select the appropriate mitigation strategies;</p> <p>b) implement the mitigation strategies; and</p> <p>c) monitor the strategies' implementation and effectiveness.</p>	
<p><b>4.10 FRMS safety assurance procedures</b></p> <p>(1) FRMS safety assurance procedures must provide for:</p> <p>(a) continuous monitoring of the performance of the FRMS; and</p> <p>(b) the analysis of fatigue-related trends; and</p> <p>(c) measurements to validate the effectiveness of mitigation strategies.</p> <p>(2) FRMS safety assurance procedures must include a formal process for managing changes to the FRMS arising from:</p> <p>(a) the identification of changes in the operational environment that may affect FRMS; and</p> <p>(b) the identification of changes within the ATS provider's</p>	<p><b>Appendix 6 to Annex 11:</b></p> <p><b>3. FRMS safety assurance processes</b></p> <p>The air traffic services provider shall develop and maintain FRMS safety assurance processes to:</p> <p>a) provide for continuous FRMS performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:</p> <p>1) hazard reporting and investigations;</p> <p>2) audits and surveys; and</p> <p>3) reviews and fatigue studies (both internal and external);</p> <p>b) provide a formal process for the management of change. This shall include, but is not limited to:</p>	<p>Proposed Section 4.10 reflects Section 3, Appendix 6 of Annex 11, but using terminology from CAO 48.1.</p>

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<p>organisation that may affect FRMS.</p> <p>(3) The FRMS safety assurance procedures must include a formal process to assess:</p> <p>(a) what impact a change mentioned in paragraph (2)(a) or (b) may have on the effective performance of the FRMS; and</p> <p>(b) for such a change—what amendment, change or modification may be needed to the FRMS to ensure its continued effective performance.</p> <p>(4) FRMS safety assurance procedures must provide for the continuous improvement of the FRMS, by including the following:</p> <p>(a) the elimination or modification of fatigue-related risk controls that:</p> <p>(i) have had unintended negative consequences; or</p> <p>(ii) are no longer required because of changes in the ATS provider's operational or organisational environment;</p> <p>(b) routine evaluations of facilities, equipment, documentation and procedures to determine their implications for fatigue-related risk management and control;</p> <p>(c) identification of emerging fatigue-related risks to allow the introduction of new procedures and procedures to mitigate such risks.</p>	<p>1) identification of changes in the operational environment that may affect the FRMS;</p> <p>2) identification of changes within the organization that may affect the FRMS; and</p> <p>3) consideration of available tools which could be used to maintain or improve FRMS performance prior to implementing changes; and</p> <p>c) provide for the continuous improvement of the FRMS. This shall include, but is not limited to:</p> <p>1) the elimination and/or modification of preventive controls and recovery measures that have had unintended consequences or that are no longer needed due to changes in the operational or organizational environment;</p> <p>2) routine evaluations of facilities, equipment, documentation and procedures; and</p> <p>3) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.</p>	
<p><b>4.11 FRMS safety promotion procedures</b></p> <p>(1) FRMS safety promotion procedures for fatigue-related hazards must include training and communication programs capable of supporting and continuously improving all elements of the FRMS in the delivery of optimum safety levels.</p> <p>(2) For the purposes of subsection (1), FRMS safety promotion procedures must include the following:</p> <p>(a) training programs for management, operational persons, and all other relevant personnel to ensure competency levels commensurate with the role and responsibility of the person under the FRMS;</p> <p>(b) an effective FRMS communication plan that:</p> <p>(i) explains all elements of the FRMS to management, operational persons, and all other relevant personnel; and</p> <p>(ii) describes the communication channels which they must use to gather, disseminate and apply FRMS-related information.</p>	<p><b>4. FRMS promotion processes</b></p> <p>FRMS promotion processes support the ongoing development of the FRMS, the continuous improvement of its overall performance, and attainment of optimum safety levels. The following shall be established and implemented by the air traffic service provider as part of its FRMS:</p> <p>a) training programmes to ensure competency commensurate with the roles and responsibilities of management, air traffic controllers, and all other involved personnel under the planned FRMS; and</p> <p>b) an effective FRMS communication plan that:</p> <p>1) explains FRMS policies, procedures and responsibilities to all relevant stakeholders; and</p> <p>2) describes communication channels used to gather and disseminate FRMS-related information.</p>	<p>Proposed Section 4.11 reflects Section 4, Appendix 6 of Annex 11, but using terminology from CAO 48.1.</p>
<p><b>4.12 FRMS change management procedures</b></p> <p>(1) For this section, <b>significant change</b> means:</p> <p>(a) any increase to the values required under paragraph 4.08(1)(a); and</p> <p>(b) any decrease to the values required under paragraph 4.08(1)(b); and</p> <p>(c) any other change to any element of the FRMS that does not maintain or improve, or is not likely to maintain or improve, aviation safety.</p> <p>(2) The FRMS change management procedures must:</p> <p>(a) meet the requirements of this section; and</p> <p>(b) clearly indicate how the ATS provider will amend, change or</p>	<p><b>CAO 48.1 Appendix 7:</b></p> <p><b>7 FRMS change management procedures</b></p> <p>7.1 For this clause, a <b>significant change</b> means:</p> <p>(a) any increase to the values required under paragraph 3.2 (a); and</p> <p>(b) any decrease to the values required under paragraph 3.2 (b); and</p> <p>(c) any other change to any element of the FRMS that does not maintain or improve, or is not likely to maintain or improve, aviation safety.</p> <p>7.2 The FRMS change management procedures must:</p> <p>(a) meet the requirements of this clause; and</p>	<p>Section 4.12 proposes change management requirements for FRMS consistent with those specified in CAO 48.1.</p>

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<p>modify any element of the FRMS consistently with the requirements of this section.</p> <p>(3) The change management procedures apply to an ATS provider whether it has a trial implementation approval or a full implementation approval.</p> <p>(4) The ATS provider must not make a significant change to any element of the FRMS unless an application to make the change is approved in writing by CASA.</p> <p>(5) An application for approval of a significant change must:</p> <ul style="list-style-type: none"> <li>(a) be in writing; and</li> <li>(b) set out the change; and</li> <li>(c) be accompanied by a copy of the part of the ATS provider's FRMS documentation affected by the change, clearly identifying the change.</li> </ul> <p>(6) An ATS provider must not make a change to the FRMS that is not a significant change unless:</p> <ul style="list-style-type: none"> <li>(a) the ATS provider's FRMS change management procedures provide for non-significant changes; and</li> <li>(b) the ATS provider makes the change in accordance with its procedures; and</li> <li>(c) the ATS provider has given CASA written notice of the change and a copy of the amended part of the ATS provider's operational manual clearly identifying the change.</li> </ul> <p><i>Note</i> Under regulation 172.300 of CASR, CASA may direct an ATS provider to amend its operations manual (which must include the details of the provider's FRMS: see paragraph 2.1.2.1 (oa) of this Manual of Standards).</p> <p>CASA may issue a direction to an ATS provider under regulation 11.245 of CASR if the matter affects the safe navigation and operation of aircraft. Under paragraph 11.245(2)(a), CASA must be satisfied that it would be necessary to do so in the interests of the safety of air navigation. This could include a direction to the ATS provider to amend, change or modify the FRMS.</p>	<ul style="list-style-type: none"> <li>(b) clearly indicate how the AOC holder will amend, change or modify any element of the FRMS consistently with the requirements of this clause.</li> </ul> <p>7.3 The change management procedures set out in this clause apply to:</p> <ul style="list-style-type: none"> <li>(a) an AOC holder with a trial FRMS implementation approval; and</li> <li>(b) an AOC holder with a full FRMS implementation approval.</li> </ul> <p>7.4 After issuing an FRMS implementation approval, CASA may, in writing, direct an AOC holder to amend, change or modify the FRMS (including practices and documents), and the AOC holder must comply within the time specified by CASA in the direction.</p> <p><i>Note 1</i> A failure to comply may result in revocation of the FRMS implementation approval.</p> <p><i>Note 2</i> CASA's power to direct changes to an FRMS is an emergency power for safety purposes only. It does not relieve any approval holder of their own obligation to improve the performance of their FRMS where this is safe and practicable.</p> <p>7.5 The AOC holder must not make a significant change to any element of the FRMS unless an application to make the change is approved in writing by CASA.</p> <p>7.6 An application for approval of a significant change must:</p> <ul style="list-style-type: none"> <li>(a) be in writing; and</li> <li>(b) set out the change; and</li> <li>(c) be accompanied by a copy of the part of the AOC holder's FRMS documentation affected by the change, clearly identifying the change.</li> </ul> <p>7.7 A change to the FRMS that is not a significant change must be:</p> <ul style="list-style-type: none"> <li>(a) made in accordance with the FRMS change management procedures; and</li> <li>(b) notified in writing to CASA within the following period after the change is made: <ul style="list-style-type: none"> <li>(i) 7 days;</li> <li>(ii) either: <ul style="list-style-type: none"> <li>(A) if an AOC holder's approved SMS amendment process under Part 82 of the CAOs has a different CASA notification period for SMS amendments — the period specified in the process; or</li> <li>(B) if an AOC holder's exposition change process under the Regulations has a different CASA notification period for non-significant changes — the period specified in the process.</li> </ul> </li> </ul> </li> </ul>	
<p><b>4.13 Trial FRMS implementation approval</b></p> <p>(1) CASA may, on a written application made by an ATS provider, issue the ATS provider with an FRMS implementation approval for up to 24 months, if CASA is satisfied that each element of the ATS provider's FRMS:</p> <ul style="list-style-type: none"> <li>(a) complies with and meets the requirements, attributes and characteristics of an FRMS under this Chapter; and</li> <li>(b) is capable of delivering: <ul style="list-style-type: none"> <li>(i) identified safety outcomes; and</li> <li>(ii) fatigue-risk data and reports; and</li> <li>(iii) continuous improvement in the delivery of safety</li> </ul> </li> </ul>	<p><b>CAO 48.1 Appendix 7</b></p> <p><b>8 Trial FRMS implementation approval</b></p> <p>8.1 CASA may, on written application, issue an AOC holder with a trial FRMS implementation approval for up to 24 months, if CASA is satisfied that each element of the AOC holder's FRMS:</p> <ul style="list-style-type: none"> <li>(a) complies with and meets the requirements, attributes and characteristics of an FRMS under this Appendix; and</li> <li>(b) is capable of delivering: <ul style="list-style-type: none"> <li>(i) identified safety outcomes; and</li> <li>(ii) fatigue-risk data and reports; and</li> <li>(iii) continuous improvement in the delivery of safety outcomes.</li> </ul> </li> </ul> <p>8.2 If an approval was issued under subclause 8.1, CASA may, by</p>	<p>Section 4.13 proposes trial implementation approvals for an FRMS consistent with the CAO 48.1.</p>

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<p>outcomes.</p> <p>(2) CASA may extend the duration of an approval issued under subsection (1):</p> <p>(a) on application by the ATS provider; or</p> <p>(b) on CASA's own initiative, if CASA considers that aviation safety requires a longer trial FRMS implementation approval period before a full FRMS implementation approval.</p> <p>(3) For the purposes of subsection (2), CASA can extend the duration of a trial FRMS implementation approval by issuing a new trial FRMS implementation approval.</p>	<p>issuing a new trial FRMS implementation approval, extend the duration of the approval:</p> <p>(a) on the written application of the AOC holder; or</p> <p>(b) on CASA's own initiative if CASA considers that aviation safety requires a longer trial FRMS implementation approval period before a full FRMS implementation approval.</p> <p><i>Note</i> More than 1 extension is possible if CASA considers it appropriate and trial FRMS implementation approval status could, therefore, be required to last longer than 24 months.</p>	
<p><b>4.14 Full FRMS implementation approval</b></p> <p>(1) CASA may, on a written application made by an ATS provider, issue the ATS provider with a full FRMS implementation approval, if the ATS provider:</p> <p>(a) has held a trial FRMS implementation approval for a period of at least 12 months; and</p> <p>(b) satisfies CASA, through relevant data and reports, that the FRMS:</p> <p>(i) is demonstrably delivering the safety outcomes expected when the trial FRMS implementation approval was given; and</p> <p>(ii) is capable of delivering continuous improvement in the delivery of safety outcomes.</p> <p>(2) If CASA decides not to issue the ATS provider with a full FRMS implementation approval, the ATS provider may apply again to CASA for a trial FRMS implementation approval under section 4.13.</p>	<p><b>CAO 48.1 Appendix 7</b></p> <p><b>9 Full FRMS implementation approval</b></p> <p>9.1 CASA may, on written application, issue an AOC holder with a full FRMS implementation approval, if the AOC holder:</p> <p>(a) has held a trial FRMS implementation approval for at least 12 consecutive months; and</p> <p>(b) satisfies CASA, through relevant data and reports, that the FRMS:</p> <p>(i) is demonstrably delivering the safety outcomes expected when the trial FRMS implementation approval was given; and</p> <p>(ii) is capable of delivering continuous improvement in the delivery of safety outcomes.</p> <p>9.2 If, for this clause, CASA decides not to issue the AOC holder with a full FRMS implementation approval, the holder may apply again to CASA for a trial FRMS implementation approval and clauses 8 and 9 will apply according to their terms.</p> <p>9.3 For paragraph 9.1 (a), a trial FRMS implementation approval is deemed to include such an approval issued under <i>Civil Aviation Order 48.1 Instrument 2013</i> as in force immediately before the commencement of this CAO.</p>	<p>Section 4.14 proposes full implementation approvals for an FRMS consistent with the CAO 48.1.</p>