



## Background

Should an AOC holder have operational conditions that may make compliance with the prescriptive appendices of CAO 48.1 (2019) (with or without a minor variation) challenging, Appendix 7 “Fatigue Risk Management System” (FRMS) may be a suitable option.

Conducting a “gap analysis” of the AOC holder’s current systems and processes against the components/elements of an FRMS is an initial step toward deciding if an FRMS may be appropriate, and identifying what may be required to support and maintain an FRMS.

The ICAO DOC 9966 *Manual for the Oversight of Fatigue Management Approaches* contains an FRMS evaluation process for evaluating an applicant’s FRMS. The CASA FRMS Gap Analysis Tool follows the concepts of the ICAO checklist, however the focus is on the applicant reviewing their existing systems and processes to highlight what is in place and what is needed to establish an FRMS in accordance with CAO 48.1 (2019) and Appendix 7.

The gap analysis tool is intended as a starting point for an organisation that is considering applying for a FRMS trial implementation approval. The tool does not replace the legislation, nor is it a full compliance checklist for CAO 48.1 (2019) and Appendix 7 to it. Completing the tool introduces the organisation to the concepts, policies, procedures and systems which may need to be established for an FRMS to function as intended managing the fatigue risks of the operation.

CASA acknowledges there is no ‘one size fits all’ FRMS and each AOC’s requirements depend on the size, complexity and fatigue risks of the operation. The tool is guidance only and does not impose obligations in relation to specific line items, systems or processes. Regardless of whether an AOC holder adopts an FRMS or other strategies to manage fatigue risk, the policies procedures and methods described in the tool may, when appropriately deployed, enhance both operational flexibility and safety.

Organisations with an existing safety management system (SMS) will note a substantial overlap between SMS policies and practices and what is required for an FRMS. Some organisations may find existing SMS systems and process can be modified or enhanced and so they are not required to establish and maintain new systems and process to support the FRMS.

In conducting the gap analysis, organisations should review each line item considering what is in place currently, document where in the operations manual the matter is dealt with, determine and record the extent to which existing policies processes and systems are present and suitable (functional), and develop a formal implementation plan to address outstanding matters prior to submitting an application for a FRMS trial implementation approval. That plan could be used to develop and complete the application. Should an organisation decide to apply for an FRMS, the completed gap analysis form can be provided with the application. The [CASA Regional Office](#) or the CASA Fatigue Panel are available to discuss any questions that may arise.



## Component 1 – FRMS Policy and Objectives

FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 1.1 - Management Commitment</b>						
Does the policy identify all operations to which the FRMS applies?						
Is the policy appropriate to the size, nature and complexity of the organisation?						
Does the policy state the safety objectives of the FRMS?						
Has the policy been signed and clearly endorsed by the accountable executive/manager?						
Does the policy declare management’s commitment to effective reporting, adequate resourcing and continuous improvement?						
Is the policy periodically reviewed to ensure that it remains relevant and appropriate?						
<b>Element 1.2 - Fatigue Safety Accountabilities</b>						
Does the AOC holder understand and acknowledge that as the accountable person for the FRMS, they must provide enduring resources to implement and maintain the FRMS?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Has the AOC holder appointed an FRMS Manager to be responsible for the day-to-day implementation, management and continuing effectiveness of the FRMS?						
Have the FRMS authorities, responsibilities and accountabilities of all relevant personnel been defined and documented?						
Does the FRMS Manager have control of the financial and human resources required for the FRMS? If not, how is fatigue funding and resourcing assured?						
Does the FRMS Manager have appropriate authority for decision making for all matters with operational fatigue risk implications (e.g. aircraft selection, FCM allocations, training)? If not, how are matters with operational fatigue risk implications managed?						
Is there a fatigue safety committee/group for the purpose of implementing, maintaining and reviewing the FRMS and the related safety performance?						
Is the fatigue safety committee/group chaired by the FRMS Manager or by an appropriately assigned deputy, with adequate knowledge of fatigue science and the FRMS?						
Does the fatigue safety committee/group include relevant operational or departmental heads, as applicable?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 1.3 - Roles and Responsibilities of key personnel</b>						
Is the FRMS Manager qualified to manage and oversee the day-to-day operations of FRMS (experience, training, qualification)?						
Does the FRMS Manager have access to the CEO, directly or via a Safety Manager concerning the implementation and operation of the FRMS?						
Does the FRMS Manager hold other responsibilities that may impact on their role as FRMS Manager?						
Are there documented organisational diagrams, including names, positions, specific FRMS responsibilities and duties and job descriptions?						
Do all personnel understand their authorities, responsibilities and accountabilities related to all FRMS processes, decisions and actions?						
<b>Element 1.4 - FRMS &amp; SMS Integration</b>						
Is there an existing SMS manual or exposition endorsed by the accountable manager and approved/accepted by CASA (if applicable)?						
Is the existing SMS framework in alignment with the regulatory FRMS framework?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Does the SMS documentation clearly highlight and integrate the FRMS and its associated components and elements?						
<b>Element 1.5 - FRMS Documentation</b>						
Is there an operations manual/exposition/document specifying all matters relevant to the FRMS (i.e. an FRMS Manual)?						
Does the FRMS Manual identify and describe all associated processes, procedures and records which support the FRMS?						
Is there a process to periodically review FRMS documents including the FRMS Manual to ensure their continued suitability, adequacy, and effectiveness?						



## Component 2 – Hazard identification, Risk assessment and Mitigation procedures

FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 2.1 - Hazard Identification</b>						
Is the FRMS reporting system based on “just culture”, with personnel encouraged to report any fatigue-related hazard or event without fear of retribution?						
Is there a process for the reporting of fatigue hazards/incidents by all employees?						
Is there a process for anonymous reporting of fatigue hazards/incidents?						
Are there procedures to ensure reports of fatigue hazards/incidents are confidential?						
Are there procedures for analysis (through inquiry or investigation as appropriate) of all reported fatigue hazards/incidents/accidents?						
Are there self-evaluation processes, such as reviews, surveys, operational audits and assessments related fatigue risk in the current operation?						
Are there procedures to review fatigue hazards from relevant industry reports, for follow-up actions or risk evaluation?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<p>Is there a process to conduct formal fatigue hazard analyses, such as:</p> <ul style="list-style-type: none"> <li>• introduction of new shift/roster systems</li> <li>• introduction of new long-range or greater operations</li> <li>• changes in crewing of high-risk tasks</li> <li>• operations being performed in the WOCL (0200 to 0559)?</li> </ul>						
<p>Has the organisation identified key sources of data that contribute to fatigue hazard identification, including:</p> <ul style="list-style-type: none"> <li>• reports from employees</li> <li>• incident and accident data</li> <li>• performance on flight data monitoring programs (FDM) or Line Operations Safety Audits (LOSA)</li> <li>• reports of fatigue-related symptoms and behaviours</li> <li>• individual sleep and wake data from employees</li> <li>• analysis of rosters and actual work hours?</li> </ul>						
<p>Does the organisation use predictive, proactive, and reactive risk management strategies?</p>						
<p>Does the organisation use the hazard identification processes in determining all relevant maximum operational limits and minimum ODP and rest limits?</p>						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 2.2 - Risk Assessment</b>						
Are there procedures to ensure that fatigue hazards are appropriately risk assessed considering the context with probability and severity determined in relation to the possible consequences?						
Are there set of criteria for evaluating fatigue-related risk and the level of risk the organisation is willing to accept?						
Is there a documented hazard identification and risk mitigation procedure involving the use of objective fatigue risk analysis tools?						
Are the fatigue risk assessments and mitigations approved by the appropriate level of management?						
Is there a procedure for monitoring the effectiveness and the periodic review of existing fatigue risk mitigations?						
Is there a procedure for remedial and mitigation actions whenever unacceptable fatigue risk levels are identified?						
Is there a procedure to prioritise identified hazards for risk mitigation actions?						
Is there systematic and ongoing review of all aviation fatigue-related operations, processes, facilities and equipment, relevant to the hazard identification and risk management processes?						





FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Are there documented corrective and preventative actions to respond to fatigue hazard/event analysis?						
Are all risk analyses documented, reported and on file for review by the organisation, employees and CASA?						
Are corrective/preventative actions, including timelines and methods, documented?						

## Component 3 – Fatigue Risk Controls

FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 3.1 - Practical operating procedures</b>						
Does the organisation have a validated process for ensuring that both planned and actual work hours provide sufficient sleep opportunity for FCMs (e.g. rostering software)?						
Are all planned work schedules and rosters analysed for fatigue hazards prior to publishing?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Are the reporting and required actions clearly described when insufficient sleep opportunities are identified within a given pairing/trip/roster?						
Are FCMs provided with instructions and guidance in relation to delays to promote sufficient sleep opportunities?						
Are the processes or systems for assessing sleep opportunities reviewed on a regular basis to ensure they are operating effectively?						
Does the system provide the processes necessary to ensure appropriate management of FRMS related records?						
Is there evidence of meaningful consultation with all relevant staff in all FRMS related matters?						
Are reporting and procedures clearly defined for occasions when FCMs have insufficient sleep or experience extended wakefulness?						
Are all fatigue reports (work and non-work related) dealt with in a “just and fair” manner?						
Does the organisation provide appropriate tools for FCMs to assess fatigue-related symptoms and behaviours in themselves and others?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Are reporting procedures and required actions clearly defined for occasions when employees exhibit fatigue-related symptoms, or observe fatigue-related symptoms in a colleague?						

## Component 4 – FRMS Assurance and Monitoring

FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 4.1 - Fatigue Safety Assurance</b>						
Are the fatigue performance indicators relevant to the organisation's safety policy as well as management's high-level fatigue management objectives/goals?						
Do the fatigue performance indicators include alert/target settings to identify unacceptable performance levels, and planned improvement goals?						
Is the setting of fatigue alerts or higher risk of fatigue criteria based on objective fatigue metrics principles?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Do the fatigue performance indicators include quantitative monitoring of fatigue involvement in high-consequence safety outcomes (e.g. accident and incident rates) as well as lower-consequence events (e.g. rate of noncompliance, deviations)?						
Are fatigue performance indicators and their associated performance settings developed in consultation with the relevant staff and CASA?						
Is there a procedure for corrective or follow-up action to be taken when fatigue related targets are not achieved, and fatigue target/alert levels are exceeded/breached?						
Are the fatigue performance indicators being periodically reviewed?						
<b>Element 4.2 - Fatigue Hazard/event Reporting</b>						
Are FCMs able to access, complete and submit a fatigue report in a simple and timely manner?						
Is there a feedback process to notify contributors that their reports have been received and any actions taken?						
Is there process for reporting on fatigue hazards where the individual is not identified?						
Is there a process for formal review of reports with established risk thresholds for analysis, enquiry, investigation (if required)?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 4.3 - Investigation and Analysis</b>						
Are there procedures in place to conduct fatigue related enquiries and investigations?						
Do the procedures ensure all reported occurrences and deficiencies are investigated and/or addressed?						
Is the analysis of occurrences and deficiencies adequate to identify contributing and causal factors?						
Are corrective/preventive actions generated from the event analysis and investigations?						
How is the technical competence of staff assigned to investigate occurrences and deficiencies determined?						
Are there timelines and responsible action holders identified for corrective actions?						
<b>Element 4.4 - Continuous Improvement</b>						
Is there a regular periodic internal audit of the FRMS?						
Does the internal FRMS audit/assessment contribute to the management FRMS review processes and timings?						
Does the management review of FRMS include the sampling of completed/existing fatigue hazard identification, risk assessments, remedial actions and mitigations?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Does the management review of FRMS include the sampling of fatigue performance indicators for data currency and modification of performance settings?						
Does the management review of FRMS cover external resources where applicable (e.g. provider of biomathematical modelling tools)?						
Is the FRMS Manager involved in the process for the FRMS audit/assessment reports at an appropriate time and at the appropriate level?						
Does the management review of FRMS processes include employee consultation and feedback?						

## Component 5 – Safety Promotion

FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 5.1 - Training and Education</b>						
Is there a programme to provide FRMS training/familiarisation to personnel involved in the implementation of the FRMS?						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
Has the organisation conducted a training needs analysis, or similar, to identify the required training and assessment of relevant personnel with respect to establishing they are competent for their role in the FRMS?						
Has the accountable executive/manager undergone appropriate FRMS familiarisation, briefing or training?						
Are personnel involved in conducting fatigue risk mitigation provided with appropriate fatigue risk management training/familiarisation?						
Is there evidence of a whole-of-organisation FRMS education or awareness efforts?						
Is there is a process measures the effectiveness of FRMS training?						
Does the organisations fatigue risk awareness training programme include: <ul style="list-style-type: none"><li>• a basic overview of sleep, why we need it, and what happens if we don't get it</li><li>• definition of fatigue and fatigue-related risk</li><li>• examples of the consequences of fatigue, including operational performance, health and lifestyle factors</li></ul>						



FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<ul style="list-style-type: none"> <li>an overview of the reasons why fatigue-related risk needs to be managed— including legal liabilities</li> <li>personal fatigue risk management strategies— such as sleep hygiene, lifestyle, diet, exercise and relaxation?</li> </ul>						
<p>Does the organisation have a competency-based fatigue risk management training program that include:</p> <ul style="list-style-type: none"> <li>fatigue risk awareness training (mentioned above)</li> <li>an overview of the organisation's FRMS</li> <li>organisational and individual responsibilities in managing fatigue-related risk</li> <li>a detailed explanation of the FRMS controls and management strategies</li> <li>fatigue-reporting systems and expectations</li> <li>organisation based fatigue risk management problem solving strategies/mitigation implementation?</li> </ul>						
Does the organisation's training include initial and recurrent training?						
Is the training and assessment program captured in the audit of the FRMS?						





FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 5.2 - Communication</b>						
Are there appropriate communication processes which assist the FRMS to function effectively?						
Is there evidence of a publication, circular or channel for regularly communicating fatigue /FRMS matters to employees?						
Is the organisation's FRMS manual and related guidance material accessible to all relevant personnel?						
Is there a means of monitoring the effectiveness of the dissemination of fatigue risk management information throughout the organisation?						
Does the organisation participate in sharing fatigue information with relevant external industry product and service providers or organisations, including the relevant aviation regulatory organisations?						



## Component 6 – Change Management

FRMS component/element	Manual reference	Present: Yes / No / Partial	Suitable: Yes / No / Partial	Actions required	Actions allocated to	Target date
<b>Element 6.1 - Management of Change</b>						
Are there procedures to identify changes in both the operational environment and within the AOC itself, where such changes may affect the FRMS?						
Are there procedures to amend or modify the FRMS given changes to the operational environment and the AOC?						
Does the organisation define significant and non-significant changes with respect to their maximum and minimum FDP limits and ODP's?						
Are there specific procedures to determine whether a change to an element of the FRMS does not or is not likely to maintain or improve aviation safety?						
Are there procedures for notifying CASA about changes, and seeking approval for proposed changes, where required?						