<Industry manual/exposition cover page>

Fatigue Management - Appendix 5 - Aerial work operations and flight training associated with aerial work

Company Name

<Insert image if required/delete as required>

Version

Date 03/2025

<Operators are to remove these instructions before finalising their draft.>  
**Instructions**

**How to use this Operations Manual Supplement Template**

This template is designed to assist operators in developing an Operations Manual document/section/supplement for compliance with Civil Aviation Order 48.1 (2019) (the order) and relevant Appendix of the order.

When developing the Operations Manual supplement, operators are strongly advised to refer to CAAP 48-01 available from the CASA Fatigue Resources webpage. While the CAAP is advisory in nature, the CAAP is referenced multiple times in the order as the CAAP contains highly relevant information and guidance to assist operators in developing a compliant submission.

Given the range of activities which can be conducted by AOCs and the variance in the size and complexity of aviation organisations, this template is generic in nature and may be of more assistance to smaller or less complex operations.

Each operator using this template will need to amend, delete from, and add to the document as appropriate to suit your operation, procedures, organisational structure and so on. Specific items which need to be amended from the template when developing your individual Operations Manual Supplement include:

* where <XXXX> or similar is shown in the text and/or a blue highlight is used, the text will need to be replaced to reflect the relevant matter e.g. AOC holder’s name; CEO’s name; role in organisation structure; name of the system used; or other specific information particular to your organisation.
* Numerical limits are identified by green highlights. You will need to replace the green highlighted limits with the limits relevant to your operation. The actual limits you select must be informed by your hazard identification and risk assessment procedures and must not fall outside the limits prescribed in the relevant Appendix.
* Text in orange font provides guidance to assist the author when developing the procedures. CASA anticipates a compliant manual will need to contain procedures and processes dealing with the matters in orange. As mentioned, operators will also need to consult CAAP 48-01 for more comprehensive guidance. After an operator has used the orange text to guide the development of appropriate procedures, the orange text should be removed from the finished supplement prior to submission to CASA.
* The tables and forms may need to be labelled to suit your organisation’s operations manual or exposition, with relevant references in the text amended as a result.
* The numbering used in the template may need to be amended to align with the numbering system of your operations manual or exposition.

**Note:** The Definitions are specific to CAO 48.1 (2019) and appear in this template either per the order or from the CAAP 48-01 in which the language has been simplified slightly. These Definitions may not be consistent with terms used elsewhere in your operations manual or exposition but are required to be used.

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Amendment record/revision history

Amendments/revisions of this sample manual/exposition are recorded below in order of most recent first.

Table 1 Revision history

|  |  |  |  |
| --- | --- | --- | --- |
| Version No. | Date | Parts/Sections | Details |
|  |  |  |  |
|  |  |  |  |
| 2.0 | insert date change is made to each section or page | e.g. Section 1.6.3 | Summary of changes made |
| 1.0 | insert date | All | Initial issue |

References

Acronyms

The acronyms and abbreviations used in this sample manual/exposition are listed in the table below.

Table 2 Acronyms

|  |  |
| --- | --- |
| Acronym/ abbreviation | Description |
| CAAP | Civil Aviation Advisory Publication |
| CAO | Civil Aviation Order |
| CAR | Civil Aviation Regulations 1988 |
| CASA | Civil Aviation Safety Authority |
| CASR | Civil Aviation Safety Regulations 1998 |

Definitions

Where these definitions differ in wording from those in Civil Aviation Order 48.1 Instrument 2019 the wording for this CAAP was chosen to simplify complex definitions. The wording in the Instrument takes precedence and was necessary for legal drafting purposes; however, the wording from CAAP was chosen for this template to aid understanding.

**Note:** If not using this supplement ensure these definitions are captured in the operations manual set of definitions.

Table 3 Definitions

| Term | Definition |
| --- | --- |
| Access | No restriction on, or impediment to, a flight crew member’s (FCM’s) immediate and actual use of a necessity. |
| Adequate sustenance | Food and drink (including clean drinking water) in quantities sufficient to reasonably sustain a person in the person’s circumstances. |
| Consecutive | A continuous, unbroken, period of time for the duration of the hours or days mentioned. |
| Cumulative duty | The progressive sum of duty periods. |
| Cumulative flight time | The progressive total of flight time accrued by the FCM when acting as a crew member on board any aircraft but excluding flight time accrued during recreational private operations. |
| Day | The period between local midnight at home base and the subsequent local midnight at home base. |
| Duty | Any task that a person who is employed as an FCM is required to carry out associated with the business of an operator. |
| Duty period | A period of time that starts when an FCM is required by an operator to report for duty and ends when the FCM is free of all duties. A duty period includes any time spent by the FCM in positioning. |
| Fatigue | A physiological state of reduced alertness or capability to perform mental or physical tasks, which:   * may impair the ability of the FCM to safely operate an aircraft * is caused by one or more of the following: * the FCM’s lack of sleep * the FCM’s extended wakefulness * the FCM’s circadian phase at any relevant time * the FCM’s workload of mental activities, or physical activities at any relevant time.   **Note:** An individual's level of fatigue and state of alertness can also be influenced by their health, diet, fitness and overall well-being. |
| Fit for purpose | For a crew rest facility, or suitable sleeping accommodation, means that it has ergonomic characteristics that make it suitable for an FCM to obtain sleep or rest (as the case requires). |
| Flight crew member (FCM) | A crew member who is a pilot or flight engineer assigned to carry out duties essential to the operation of an aircraft during flight time. |
| Flight duty period (FDP) | A period of time that:   * starts when a person is required, by an operator, to report for a duty period in which they undertake one or more flights as part of an operating crew * ends at the later of: * the person’s completion of all duties associated with the flight, or the last of the flights; or * 15 minutes after the end of the person’s flight, or the last of the flights. |
| Flight time | The time when an FCM is acting in the capacity as a crew member on board an aircraft that includes:   * in the case of a heavier-than-air aircraft — the total time from the moment at which the aircraft first moves under its own power for the purpose of taking-off, until the moment at which it comes to rest after landing; and * in the case of a lighter-than-air aircraft — the total time from the moment at which the aircraft first becomes airborne until it comes to rest on the ground, excluding any time during which the aircraft is moored.   **Note:** Recording flight time from 'push-back' or 'off blocks', rather than from the moment the aircraft first moves under its own power (as per the definition), is acceptable.  Likewise, for rotorcraft, recording flight time from the moment the rotor blades start turning until they stop turning is also acceptable. |
| Flight training associated with aerial work | Flight training for the grant:   * the following operational ratings: * low-level rating; * aerial application rating; * night vision imaging system rating; * endorsements for the following operational ratings: * low-level rating * aerial application rating * night vision imaging system rating * the following endorsements on the flight instructor rating: * low level rating training * aerial application rating training – day training * aerial application rating training – night training * night vision imaging rating training endorsement * sling operations training * winching and rappelling training * the following endorsements on the flight examiner rating: * low level rating training: * aerial application rating training * night vision imaging system rating flight test endorsement. |
| Home base | The location, assigned by the operator to the FCM, from where the FCM normally starts and ends a duty period or a series of duty periods. |
| Late night operation | An operation where an FDP includes more than 30 minutes between the hours of 2300 and 0530 local time at the location where the pilot is acclimatised. |
| Local night | A period of eight consecutive hours which includes the hours between 2200 and 0500 local time. |
| Multi-pilot operation | A multi-pilot operation is an operation conducted under multi-pilot procedures. However, this does not include contracted recurrent training or contracted checking unless it is conducted as a multi-crew operation within the meaning of regulation 61.010 of CASR. |
| Off-duty period (ODP) | A period of time during which a pilot is free of all duties and standby associated with their employment. |
| Recreational private operation | Flying conducted by an FCM in a personal capacity, and at and for the FCM’s leisure. A flight conducted by an FCM as a private operation is not a recreational private operation if it is conducted for, or on behalf of, an entity (regardless of whether or not the entity is an operator). |
| Reporting time | The time assigned to a pilot to commence an FDP. |
| Roster | A list made available to a pilot by <XXXX>, setting out the times when the pilot is assigned to undertake duties or standby. |
| Sector | The following meanings:   * except for a rotorcraft—any flight consisting of a take-off and a landing, when conducted by a person in the capacity of an FCM; * for a rotorcraft — the period: * from when the rotor blades start turning until they stop turning; and * during which an FCM on the rotorcraft conducts 1 or more flights, each consisting of a take-off and a landing. * each hour, or each part of an hour, of an FDP spent in a synthetic training device. |
| Single pilot operation | Any operation other than a multi-pilot operation. |
| Sleep opportunity | A period of time during an ODP when an FCM:   * is not meeting the reasonable requirements of bodily functioning, such as: * eating * drinking * washing * dressing; and * has access to suitable sleeping accommodation without, under normal circumstances, being interrupted by any requirement of the operator.   **Note:** Normal circumstances refer to those situations where the operator wishes to preserve the prior sleep opportunity. Abnormal circumstances refer to the case where the operator needs to contact the FCM and it is understood that this will mean that the prior sleep opportunity has been interrupted. |
| Split-duty rest period | A predefined period of time during which an FCM:   * has access to suitable resting accommodation or suitable sleeping accommodation; and * is relieved of all duties associated with their employment by the operator. |
| Standby | A period of time during which an FCM:   * is required by an operator to hold themselves available for duties * has access to suitable sleeping accommodation * is free from all duties associated with their employment. |
| Standby-like arrangement | A period of time during which a pilot:   * is required by an operator to hold themselves available for duties * has access to suitable sleeping accommodation * is free from all duties associated with their employment. |
| Suitable sleeping accommodation | Accommodation not within an aircraft that is fit for purpose for an FCM to obtain sleep, and that includes all of the following:   * a comfortable room, compartment or facility * a single occupancy, at the discretion of the FCM * access to clean, tidy and hygienic amenities, including a toilet and hand washing basin * a bed that is comfortable, flat and horizontal, allowing the occupant to sleep on their stomach, back, and either side * minimum noise levels, including low occurrence of random noise * the means to control light, temperature and ventilation * assess to adequate sustenance. |
| Unforeseen operational circumstance | An unplanned exceptional event that becomes evident after the commencement of the FDP (i.e. un-forecast weather, equipment malfunction, or air traffic delay). |

Reference material

Table 4 Reference material

|  |  |
| --- | --- |
| Document type | Title |
| Civil Aviation Order | CAO 48.1 Instrument 2019 |
|  |  |
|  |  |

# Flight crew member fatigue management

## Fatigue management policy

<XXXX> is committed to ensuring accumulated fatigue does not reach a level where it results in unsafe working practices and procedures. In terms of pilot fatigue management, we are committed to:

* ensuring that our pilots are aware of the way fatigue builds up, to identify it, manage it and recover from it
* embracing a just safety culture that enables open and fair reporting which allows us to learn and improve our understanding of the impact of fatigue and the best ways to manage it
* fatigue management rostering practices that avoid disruptive roster patterns and minimise the risks associated with fatigued pilots, with the goal of having no flights on which pilots are impaired by fatigue to the extent that safety is impacted.

<XXXX> will not require a pilot to operate an aircraft if the pilot is suffering from fatigue or considering the circumstances of the flight to be undertaken, is likely to suffer from fatigue, which may so impair the pilot’s performance that the safety of the operation may be affected.

This policy and the fatigue management procedures noted in this manual apply to, and are expected to be followed by, (as applicable):

* all pilots employed or engaged by <XXXX> regardless of their employment status
* all staff, (including management), whose work may cause (or impact on) the fatigue of pilots, e.g., with their involvement in pilot rostering, extensions, reporting and continual improvement.

This fatigue management policy and procedures section will be formally reviewed:

* once a year on the anniversary of commencement of operations to this supplement
* upon identification of a fatigue related issue associated with this section including extensions
* upon dissemination of relevant scientific advances improving fatigue management
* if operations change significantly enough to affect rostering, crewing, training or aircraft types
* if there are any amendments to applicable legislation.

The formal review will be conducted by the Chief Pilot (or delegated person) and stored as a record associated with flight and duty times. The review is to ensure continual improvement of the system and its ongoing applicability to current operations.

## Flight duty limitations and fatigue management

<XXXX> complies with CAO 48.1 Instrument 2019, Appendix 5 for Aerial Work Operations and flight training associated with aerial work.

### Responsibilities

#### <XXXX> Responsibilities

The Chief Pilot (or delegated person) has responsibility for implementing and managing the fatigue management system on behalf of <XXXX>. Responsibilities include:

* maintaining a reporting system for fatigue occurrences
* ensuring roster limits are designed and promulgated in accordance with (iaw) the provisions of this manual
* designating and recording a home base for each pilot and ensuring that each pilot is advised of this designation
* ensure the roster is kept as up-to-date as possible and includes the most accurate account of expected operations for at least the following 7 days
* ensuring records of the following are made and stored for a minimum of 5 years:
  + the roster – the roster will be backed up daily and considered a reasonable prediction of operations for the following 7 days
  + ensuring records are maintained of all actual flight duty periods, standby periods, duty periods, split-duty periods. Off-duty periods and actual flight times of each pilot when acting in the capacity of a crew member
  + extensions and exceedances including details of the situation involved and why the extension was required for the purposes of continual improvement
* authorising extensions in unforeseen operational circumstances (iaw Section 1.3 Conditions and processes for extensions to limitations)
* maintain a register of suitable accommodation locations (hotels/motels etc.) applicable to the scope of company operations
* ensuring pilots are contacted only in accordance with the communication protocol (refer Section 1.2.1.4 Communication protocol)
* ensuring all pilots and relevant staff (including rostering staff) are trained in accordance with Section 1.2.15 Training
* ensuring all pilots are aware of the fatigue management system, its limits and procedures and their responsibilities
* conducting Fatigue Hazard Identification in accordance with Section1.2.16 Fatigue hazard identification
* conduct an annual formal review and other reviews as required by the Fatigue Management Policies and Procedures (iaw Section 1.1 Fatigue management policy).

**Notes:**

1. If these responsibilities are delegated to another staff member the details should be documented in this section.

2. This section should be specifically referenced in the general section on Chief Pilot responsibilities (and delegate if nominated).

#### Pilot responsibilities

<XXXX> recognise that many factors are outside the control of the individual and unforeseen circumstances will arise from time to time that will affect the individual’s ability to manage their sleep opportunities and level of fatigue. However, pilots have a legal responsibility to appropriately manage fatigue factors (and fitness for duty generally) that it is reasonable to consider are within their control and thereby prepare adequately for each flight duty period. Pilots also have a responsibility to notify the <XXXX> if they believe they are not or unlikely to be fit for a flight.

<XXXX> expect the following from its pilot in respect of fatigue management. All pilots must:

* participate in the Company provided training and work towards a detailed understanding of the underlying causes, effects, mitigation strategies applicable to both fatigue and alertness management
* take advantage of sleep and rest opportunities provided to achieve required restorative sleep or rest, in order to be sufficiently alert for subsequent flight duties
* monitor their fatigue state and advise the Chief Pilot (or delegated person) via the communications protocol (refer Section 1.2.1.4 Communication protocol) as soon as possible once they believe that they might not be available or could have an unacceptable fatigue risk level
* complete a fatigue occurrence report (Form OR) when they believe that fatigue has led to an unacceptable reduction in safety margins or would have led to an unacceptable reduction in safety margins had some additional mitigating action not been taken
* accurately record actual flight and duty times (refer Section 1.2.11 Recording flight & duty times)
* notify the Chief Pilot (or delegated person) via the communications protocol as soon as it becomes apparent that flight and duty time limits might be exceeded (e.g. due to unforeseen operational circumstances)
* if working on a contract basis, provide details of previous FDPs, ODPs and cumulated flight and duty time so that rosters can be built that do not exceed any limits
* if they become aware of any errors in rosters, or the possibility of exceeding cumulative limits bring these to the attention of the Chief Pilot (or delegated person)
* be aware of obligations relating to extensions and reassignments, including when to refuse, consideration of alertness and authorisation requirements
* notify the Chief Pilot (or delegated person), of their personal situation or any changes to their situation, if they believe that, because of its nature, duration, effects or for any other reason, it might impact on their ability to meet the operator’s fatigue risk management policies or their obligations. This could include factors such as: a new baby, being a caregiver, secondary employment, travelling a long distance to report for duty. Once notified this will be noted as a continuing state of affairs for the pilot and does not require repetition reporting (unless circumstances change).

#### Alertness consideration table (Form ACTab)

It is recommended that the alertness consideration table Form ACTab be used to assist a pilot in assessing their alertness before an FDP or extension. This table is for assistance to increase the awareness of the Pilot and operator to the individual’s current fatigue status. If the pilot feels they are too fatigued to commence or continue in an FDP or to undertake an extension, then they should report fatigued and discontinue the FDP. Similarly, while <XXXX> may use the Form ACTab to assist in discussing the pilot’s level of fatigue, the form, similar to any predictive fatigue tool, should not be used as a means to apply any pressure pilots to continue an FDP or undertake an extension.

Alternatives to Form ACTab (Appendix B) may be found on the iOS App Store or the Google Play Store. For example: Fatigue SAFE, Fatigue App. These applications could be used as a starting point in the assessment of an individual's fatigue level.

#### Communication protocol

All communications between <XXXX> and a pilot during an ODP or that could impact on the pilot’s sleep prior to an FDP must be in accordance with the following communication protocol:

On Standby

A pilot will only be contacted during standby to call the pilot out of standby for a non-flying duty or to commence a FDP. Any other communication initiated by <XXXX> will be treated as a period of duty and a minimum of 30 minutes subtracted from the maximum FDP until 8 hours after the communication ended.

A pilot on standby must have their registered mobile phone on and loud enough to ensure they are woken should a callout be required.

During an Off-Duty Period

A pilot will only be contacted during the 10 hours prior to an FDP if there is to be a delay in FDP commencement time and then preferably by SMS. A voice message may be left if the message is deemed too complex for SMS:

* the pilot should ensure that their registered mobile is on silent/do not disturb settings during sleep periods to, as best as possible, ensure uninterrupted restorative sleep
* the pilot must check their SMS messages and reply to any SMS or voice message notifying the pilot of a delay, before leaving the location of the prior sleep opportunity
* an SMS sent and shown as delivered or leaving a voice message is deemed to be notification however the pilot shall still reply to the SMS before leaving the location of the prior sleep opportunity to confirm they understand the message
* the timing and content of SMS messages (and phone calls) regarding delays will be logged in the rostering system.

**Note:** While a formal delayed reporting procedure is not required by Appendix 5 contacting a pilot prior to an FDP can represent a fatigue hazard and so managing communications such as notification of a delay by the procedure above may assist in managing this risk to safety. The communication method described above, including the use of SMS, is only one method of managing contact; any effective method that did not interrupt sleep would be acceptable.

All required or urgent communications between a pilot and <XXXX> during an ODP or FDP will be in accordance with the following communication protocol:

* in the first instance the pilot will contact the Chief Pilot (or delegated person) as soon as practicable on the duty phone number
* if no answer is received, the pilot will leave a detailed voice message including their name and aircraft registration (if appropriate) and send an SMS message notifying that a voice message has been left
* if the message relates to an extension request, the pilot must ensure they receive a response approving the extension prior to extending.

All required or urgent communications between the Chief Pilot (or delegated person) and a pilot during an FDP will be in accordance with the following communication protocol:

* in the first instance the Chief Pilot (or delegated person) will contact the pilot on their registered mobile phone number supplied by the pilot
* if no answer is received, the Chief Pilot (or delegated person) will leave a detailed voice message and send an SMS message notifying that a voice message has been left
* if the message relates to an extension request, the Chief Pilot (or delegated person) will gather sufficient information about the nature of the extension and the level of fatigue of the pilot to ensure they can adequately assess whether safety will be impacted before approving the extension.

### Prior sleep opportunity

When rostered for an FDP or period of standby the pilot will have at least 8 consecutive hours sleep opportunity in the preceding 10 hours before the planned commencement of their duty. The sleep opportunity provided before an FDP will not include the 1 hour immediately before the planned commencement of an FDP.

If the communications cannot be avoided, any communication initiated by <XXXX> before the commencement time of the FDP will be treated as a period of duty and a minimum of 30 minutes subtracted from the maximum FDP until 8 hours after the communication ended.

**Note:** While there is no specific requirement for prior sleep opportunity in Appendix 5 – Aerial Work, operators are strongly encouraged to publish limits and a procedure such as this to ensure staff are aware of, and protect the period before a pilot’s FDP (or standby) from interruptions.

Non-flying duties prior to an FDP

If a pilot is required to perform non-flying duties within the 8 hours immediately before commencing an FDP (rostered or otherwise), the maximum FDP must be reduced by the amount of time spent doing those non-flying duties. If the period of non-flying duty was less than 30 minutes, then 30 minutes will be subtracted from the maximum allowable FDP.

### Duty time, FDP flight time and cumulative limits

For <XXXX> an FDP is a period of time which starts when a pilot is required by <XXXX> to report for a duty period in which one or more flights as a pilot are undertaken and ends not less than 15 minutes after the end of the pilot’s final flight.

**Note:** The minimum time according to CAO 48.1 Instrument 2019 that the FDP can end after the final flight is 15 minutes after shutdown however the operator should choose a time that reflects their operations and that typically enables the pilot to complete all safety critical actions such as post flight inspections and necessary paperwork associated with the flight.

Any period of non-flying duty that precedes a flight such as a period of simulator flying, management duties, administrative tasks, maintenance tasks etc., will be subtracted from the maximum FDP until that period of duty is no longer within 8 hours of the commencement of an FDP. If the pilot is required to commute to the place where the duty is required and then return, both the duty and any commute time will be subtracted from the maximum FDP while that period is within 8 hours of the commencement of a subsequent FDP.

Table 5 Maximum FDP (in hours) for an FCM according to local time at the start of the FDP

|  |  |
| --- | --- |
| Local time at start of FDP | Maximum FDP (hours) |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Single-pilot operation | Multi-pilot operation |  |
|  |  | **For 1 or 2 sectors** | **For 3 or more sectors** |
| 0500 – 0559 |  |  |  |
| 0600 – 0659 |  |  |  |
| 0700 – 1159 |  |  |  |
| 1200 – 1459 |  |  |  |
| 1500 – 1559 |  |  |  |
| 1600 – 0459 |  |  |  |

Any flight training conducted during an FDP will be conducted during the first 7 hours of flight time in the FDP.

In any 168 consecutive hours, an FCM must not be assigned, or conduct, more than 4 FDPs which include any time between midnight and 0459 local time.

**Notes:**

1. The maximum FDP in the table above are examples only and need to be determined by each organisation after taking the hazard identification and risk mitigation processes into account. . The resulting limits cannot exceed the limits within Appendix 5 of CAO 48.1.

2. While there is no specific daily flight time limit for Aerial Work activities in CAO 48.1 Instrument 2019, Operators are strongly encouraged to publish a flight time limit in their operations manual and use this as another means to manage fatigue risk.

3. A separate table can be used to list limits for sub-groups of pilots such as new pilots, pilots at different bases, or for different conditions such as above certain temperatures or at different times of the year, for example dry and wet season limits.

4. It is possible to list different limits for different types of operations under the one AOC by expanding the table and, while this is recommended, attention must then be paid to procedures for transferring pilots between operations.

5. Refer to CAAP 48.1-01 section 4.1 and Appendix F for detailed guidance.

Table 6 Permitted increase in FDP limits

|  |
| --- |
| Increased FDP conditions |
| Note: Clause 5 of Appendix 5 also requires that a pilot who conducts an increased FDP under this clause has an off-duty period of at least 36 hours, including 2 local nights, during the 168 consecutive hour period. |

|  |  |  |
| --- | --- | --- |
| **Condition that influences increase** | **Single-pilot limit** | **Multi-pilot limits** |
| Maximum FDP not more than | 12 hours | 14 hours |
| Maximum FDP increases in 168-hour period | No more than 2 occurrences | No more than 2 occurrences |
| Prior ODP requirement | Not less than 12 hours | Not less than 12 hours |
| ODP following increased FDP | Not less than 12 hours | Not less than 12 hours |
| Increased FDP to be further increased | Cannot increase with split duty  Can be extended by 2 hours | Cannot increase with split duty  Can be extended by 2 hours |

Table 7 Cumulative flight time limits

|  |
| --- |
| The following limits on cumulative flight time will apply |

|  |  |
| --- | --- |
| Period | Duty time limit (must not exceed) |
| 168 consecutive hours (7 days) | 50 hours |
| 28 consecutive days | 170 hours – can be reset to zero following a period of 5 consecutive days off-duty |
| 90 consecutive days | 450 hours – can be reset to zero following a period of 5 consecutive days off-duty |
| 365 consecutive days | 1200 hours – can be reset to zero following 28 consecutive days off-duty |

**Note:** The 365 flight time limit of 1200 hours may be reset to zero if the DCM is provided at least 28 consecutive yours off duty.

### Increase in FDP limits by split duty

Split-duty rest periods may be assigned as part of the rostered FDP or they may be assigned on the day of operations. Rostering staff will notify the pilot of the need for a split duty rest period as soon as they become aware. The split-duty rest period must have a designated rest location that meets the standard for suitable sleeping or resting accommodation (refer Section 1.2.14 Accommodation).

Table 8 Split duty times and limits

| **Location/time** | **Minimum split duty period** | **FDP limits** |
| --- | --- | --- |
| Suitable resting accommodation. | 2 hours plus any time required to commute to and from the accommodation. | * Is increased by half the split duty. * Maximum increase is 2 hours. * Remaining FDP after split can be a maximum of 6 hours. |
| Suitable sleeping accommodation – At pilot’s home, or a suitable motel or hotel. | 3 hours plus any time required to commute to and from the accommodation.  **Note:** Notify Chief Pilot (or delegated person) if allocated commute time is insufficient. | * Once 3 hours is achieved during the original FDP limit the FDP limit can then be increased by the time spent in suitable sleeping accommodation. * Remaining FDP including the split-duty rest period must not exceed 16 hours. |

### Delayed reporting time

The decisions to delay a pilot’s reporting time will be made by the Chief Pilot (or delegated person) and only after due consideration of alternative options and whether the delay might increase fatigue risk to an unacceptable level for that pilot conducting that activity. Key outcomes to manage risk are:

* if notifying before 10 hours prior to the original FDP, notification should be as early as possible so the pilot may re-arrange their rest accordingly
* if notification is within 10 hours of the start of the FDP, notification should be via the communication protocol (refer Section 1.2.1.4 Communication protocol) so that the pilot is notified before the pilot commences their commute to work. For practical purposes this is deemed to be 1 hour prior to the FDP commencing
* the new roster will be updated as soon as practicable
* managing the process of contacting FCMs to notify them of the delay
* prohibiting increasing FDP maximum limits when a delayed start time would otherwise allow it
* if a delayed start time requires a reduced maximum FDP period, rather than the start time before the delay, that reduced maximum FDP limit applies
* providing a maximum limit on extent to which a start time can be delayed in total. (e.g. a policy that does not allow delaying the start time by more than a total of 4-5 hours past the original start time, unless specific circumstances indicate this would not result in an unacceptable fatigue risk).

**Note:** While there is no specific requirement for prior sleep opportunity or delayed reporting procedures in Appendix 5 – Aerial Work, Operators are strongly encouraged to publish limits and a procedure such as this to ensure staff are aware of and protect the period before a pilot’s FDP (or standby) from interruptions.

### Reassignment

A reassignment will only be made to meet operational requirements such as changes in tasking requirements, positioning, delayed operations due to weather, maintenance or, rostered pilot unavailability (e.g. illness, fatigue, emergency).

The Chief Pilot or delegate can authorise a reassignment. In deciding whether or not to modify an FDP with a reassignment the Chief Pilot or delegate will consider:

* availability of alternate pilots
* the impact on the pilots’ duty expectations
* impact on future rostering/planning for that pilot.
* After commencing an FDP, a pilot can be reassigned a longer FDP but the reassignment must take into account:
* that the pilot considers themselves fit for the modified FDP. They must undertake a personal alertness assessment as per Form ACTab and agree to the reassignment via the communications protocol (refer Section 1.2.1.4 Communication protocol)
* not exceed cumulative, or LNO limits
* be recorded in the flight and duty records.

### Standby limits

Standby must only be undertaken in suitable sleeping accommodation. When the pilot is on standby at home this is taken to be the pilot’s usual accommodation and so no assessment of suitability is required. Any accommodation away from home base the accommodation must meet the criteria in Section 1.2.14 Accommodation.

**Note:** In this example, the operator has decided to only roster standby where the pilot is at home because the base facility only has suitable resting accommodation and does not have suitable sleeping accommodation.

The following standby limits will apply:

* a pilot will not be rostered for more than a maximum of 24 continuous hours on standby in any one standby period
* an FDP that is commenced following a callout from standby is required to be followed by a minimum ODP before the pilot can return to standby or a further FDP
* if not called out (and the standby is completed) the pilot will have at least 10 consecutive hours off-duty
* a standby that is terminated by advising the pilot via the communication protocol (refer Section 1.2.1.4 Communication protocol), is taken to have been completed and the pilot will have at least 10 consecutive hours off duty from the time they were notified.

Standby is a period when the pilot is free of all duties and so pilots are not to be contacted during standby unless it is for the purposes of advising of an impending FDP.

**Note:** There are no direct limits on the length of any one period of standby in Appendix 5 however standby must end in order for the pilot to meet the requirements for longer term off-duty periods such as the requirement for 36 consecutive hours off-duty that must include at least 2 local nights in every 336 hours (14 days).

### Positioning

For operational reasons the Chief Pilot (or delegate) may request a pilot to position to another location following a flight.

If requested to position before a flight the positioning is included as a part of the FDP and will be taken into account when determining whether the FDP can be achieved within the maximum FDP limit. The commencement of the FDP will then be the commencement of the positioning.

* The period spent positioning, along with the impact on displacement time, is considered when determining the subsequent minimum ODP.
* The period spent positioning is considered in the determination of cumulative duty time.
* The FCM does not participate as part of an operating crew during the period of positioning.

### Off-duty periods

Table 9 Off-duty periods limits

|  |
| --- |
| **Minimum ODP limits - immediately following an FDP** |
| Note: Immediately after an FDP, a pilot must have an off-duty period of at least the following number of consecutive hours, during which there must be access to suitable sleeping accommodation for at least 8 consecutive hours |

|  |  |
| --- | --- |
| If the ODP includes the period 2300 to 0559 hours | 8 hours +  any time taken to get to and from the suitable sleeping accommodation. |
| If the ODP does not include the period 2300 to 0559 hours | 10 hours  In the case of an extended commuting time this period should be increased to allow the pilot to get 8 hours access to suitable sleeping accommodation as a minimum |

|  |
| --- |
| Minimum ODP following an Extension and possible reduction to ODP |

|  |  |
| --- | --- |
| Extensions to FDP limit | Increase the minimum ODP by 1 hour for every 30 minutes or part thereof that the pilot extends over the FDP limit. |
| Option for reducing the minimum ODP when it exceeds 12 hours | If the minimum ODP exceeds 12 hours, it may be reduced to not less than 12 hours provided that the next FDP is exclusively an aerial work and is followed by an ODP of at least 36 consecutive hours and includes two local nights. |

|  |
| --- |
| Minimum longer term ODP limits - projected to end of assigned FDP or standby |

|  |  |
| --- | --- |
| Any 168 consecutive hours (7days) | Minimum of 36 consecutive hours off-duty that must include at least 2 local nights in the period if pilot conducts increased FDP IAW Table 2 |
| Any 336 Consecutive Hours (14 Days); or | Minimum of 36 consecutive hours off-duty that must include at least 2 local nights |
| Any 504 Consecutive Hours (21 Days) | Minimum of 72 consecutive hours off-duty that must include at least 3 local nights |

### Access to sustenance

Where an FDP is to exceed 5 hours <XXXX> will provide the pilot the opportunity for a meal break during that FDP. Not more than 5 hours will elapse between opportunities to access adequate sustenance. At home base a fridge has been provided specifically for food/beverage storage to facilitate access to adequate sustenance.

### Recording flight and duty times

Flight and duty records (refer Section 1.2.17) are stored in the <system> and each pilot is responsible for recording accurate flight and duty times and other relevant information in the system as soon as practicable after each duty and not more than 24 hours after the duty has been completed. If the pilot cannot record the relevant information within 24 hours, they should contact the Chief Pilot (or delegate) with the details to maintain the accuracy of the rostering system.

**Notes:**

1. The operator should make reference to how a manual system is operated if an electronic recording system is not in use. Particular reference on how limits will be monitored and kept within published parameters needs to be outlined in the procedures.

2. The operator should insert the most appropriate maximum time to record flight and duty times.

Pilots will be trained in the rostering and recording <system> as part of their fatigue knowledge training (refer Section 1.2.15 Training).

If a pilot becomes aware of any errors in rostering (or the possibility of exceeding cumulative limits) these must be brought to the attention of the Chief Pilot or delegated person as soon as possible.

The rostering and recording system will be backed up at least weekly and records (including electronic files) kept for 5 years.

**Note:** The operator should insert the most appropriate backup time that suits their operations.

### Reporting

#### Fatigue occurrence reporting

<XXXX>'s hazard reporting system includes fatigue occurrence reporting. If any of the following occur a fatigue occurrence report (Form OR) must be submitted to the Chief Pilot (or delegate):

* when a pilot has not commenced an FDP (or an FDP has not been completed) due entirely or in part to a pilot’s fatigue. This includes when the FDP is completed but only after some additional mitigating action such as adding an pilot, reducing the workload of the duty, delaying the reporting time, creating the opportunity for a nap, increasing supervision/monitoring etc
* following an FDP if the pilot in command believes, upon reflection, that the level of fatigue they or another pilot were suffering meant adequate safety margins had not been maintained throughout the flight(s)
* when the pilot notices something in the operating environment for example vibration, excessive temperatures, air conditioner failure at facility, or substandard sleeping accommodation, that is likely to impact on their, or other pilots’, alertness to such an extent that safety margins could be reduced to unsatisfactory levels
* when an incident or event has occurred to which fatigue could have been a contributing safety factor. Additionally, an incident report form (Form ZZZ) will be submitted with the fatigue details completed including the flight crew member sleep history for the previous 72 hours. The incident report form (with fatigue related issues) and/or the fatigue occurrence report will be stored as part of the Flight and Duty Records or if confidential, stored appropriately by the Chief Pilot or their delegate.

**Note:** Incident and accident reporting should also be contained in the operations manual and may refer explicitly to this section and visa-versa.

#### Extensions reporting

All extensions or exceedances to FDPs or flight time limits require an extension report to be filled out (Form ER) and provided to the Chief Pilot (or their delegate). There should be sufficient detail to establish what happened and what the circumstances were that led to the extension or exceedance for the purposes of system improvement.

### Home base

Any change to a pilot’s home base will trigger the requirement for 3 consecutive off-duty days commencing from the day the change becomes effective.

**Note:** A home base determination is not required for operations under Appendix 5 however it is highly recommended that if the operator has multiple bases and pilots’ can be required to permanently or semi-permanently change bases, then the fatigue that can be associated with this change is mitigated by an extended off-duty period.

### Accommodation

The Chief Pilot or delegated person is responsible for ensuring that pilots have access to suitable accommodation when away from home base and assigned to be off duty on standby, or on split duty.

A pilot’s home or residence is taken to be suitable accommodation (resting or sleeping).

The Chief Pilot or delegated person will retain a list of assessed and suitable accommodation for the purposes of rostering and this will form part of the flight and duty records.

When assessing sleeping accommodation that is not a three star (or equivalent) commercial motel or hotel for suitability the standard for suitable sleeping accommodation (see definitions) will be required.

If the accommodation is within a commercial motel or hotel that has previously been used by flight crew without any adverse reports, or if a pilot can attest to the suitability of the facility, it is deemed suitable. If a pilot finds any aspect of away accommodation unsuitable, they must advise the Chief Pilot or delegate and submit a fatigue occurrence report (Form OR) as a ‘general concern regarding fatigue’.

If the anticipated accommodation is a commercial hotel of 3 stars or more standard the assessment by the Chief Pilot (or delegated person) can be done remotely.

When a pilot is away from home base, they should ensure the quality of their restorative sleep, including by ensuring as much as possible that they will not be disturbed. If at a hotel this can be facilitated by advising reception staff not to disturb (i.e. no phone messages unless very urgent), by putting the ‘do not disturb’ sign on the door and by ensuring mobile phones are on silent (and charged).

When rostering a split duty rest period at suitable resting accommodation (other than at the pilot’s home) the standard for suitable resting accommodation (see definitions) will be required.

### Training

#### Training management

* Training includes a general fatigue knowledge component and a component that addresses <XXXX>’s specific fatigue management processes and procedures training. A syllabus of topics for each is found below in the section 'Fatigue training syllabus'
* the Chief Pilot and any delegates assigned fatigue management responsibilities such as rostering, and each pilot, will complete <XXXX>’s specific fatigue management processes and procedures training before commencing authorisation, flying or rostering activities with <XXXX>
* the Chief Pilot and any delegates assigned fatigue management responsibilities such as rostering, and each pilot, will complete fatigue knowledge training as soon as possible after they commences with <XXXX> and may be delayed if necessary but in any case no longer than 6 months from when they commenced with <XXXX>
* if the pilot can show that they have conducted training in the fatigue knowledge component with another operator that conducts similar operations then while the date of that training remains within three years (the currency period), they do not need to complete the fatigue knowledge component of this training syllabus
* before commencing in the position, the Chief Pilot will be familiar with the relevant sections of the operations manual, in particular Sections 1.1, 1.2, 1.3 & 2
* the elements of training that relate to the management of specific fatigue risk, that is, when that training forms a part of the risk management plan in the hazard and risk register, will be completed before the pilot is permitted to conduct the specific operations concerned
* at the completion of each training course each pilot or staff member must successfully complete an assessment and thereby satisfy the Chief Pilot (or delegated person) that he or she has sufficient fatigue knowledge and understanding of <XXXX>’s specific fatigue management processes and procedures to meet their obligations under <XXXX>’s fatigue risk management policies, limits and procedures. A pass mark is 80%, with any errors discussed with the student and corrected by the facilitator. Any mark below 80% will require re-training and assessment.

**Note:** The fatigue knowledge training may be integrated into any HF/NTS training that the organisation conducts.

#### Training facilitation

Training will be facilitated by a staff member who has completed a minimum of the following:

* participated as a trainee in the <XXXX> fatigue training course and received an assessment of 90% or higher (with correction to 100% knowledge)
* facilitated an entire fatigue training course under the close supervision of a <XXXX> staff member who meets the standard required to facilitate the fatigue training course (the supervisor will be present during course delivery and provide feedback), or who developed the training course.

**Note:** For the first course the facilitator shall have developed the training course.

#### Records

The training and assessment records as well as records of facilitator qualification will form part of the fatigue management records and be kept for the period that the pilot is with <XXXX> plus 1 year. Records of training and assessment should be copied and placed in each pilot’s file.

**Note:** Fatigue Training completion and currency training dates may need to be referenced in induction and currency checklists in the operations manual. Pilot records may also need a reference to Fatigue Training expiry date.

#### Fatigue knowledge training

There are three main subject areas which form the substance of the fatigue knowledge training program (fatigue, sleep and countermeasures) listed in sections 1 to 3 of the fatigue training syllabus.

#### Company specific procedures training

The training for company specific procedures includes all topics as listed in section 4 of the fatigue training syllabus.

#### Recurrent fatigue training

Chief Pilot, delegated person, each pilot and each rostering staff member will have recurrent training, both knowledge and company specific procedures, at intervals no longer than 3 years.

The recurrent training syllabus will revise previous fatigue topics (fatigue, sleep and countermeasures) as well as revision of company specific fatigue topics, especially any operations manual changes that have been promulgated solely by internal communication channels. This revision will be covered with a simple question and answer.

The recurrent training syllabus should consider including knowledge and understanding captured in the fatigue hazard section and include de-identified scenarios from the reporting systems to both expand on the pilot’s knowledge and to raise awareness of company specific hazards and mitigations.

**Note:** A further method could be to review adverse events from either the ATSB or NTSB data bases where fatigue was a known factor and examine current company management techniques that provide adequate defences to mitigate.

At the completion of each training course each pilot or staff member must successfully complete an assessment and thereby satisfy the Chief Pilot (or delegated person) that he or she has sufficient fatigue knowledge and understanding of <XXXX>’s specific fatigue management processes and procedures to meet their obligations under <XXXX>’s fatigue risk management policies, limits and procedures. A pass mark is 80% and will be corrected to 100% with the student. Any mark below 80% will require re-training and assessment.

**Note:** The currency training syllabus will need to follow the same format as that listed for the initial fatigue training syllabus.

Table 10 Fatigue training syllabus

| **Fatigue training syllabus** |  |
| --- | --- |
| Delivery method:   * Lecture and facilitated discussion   Assessment methodology:   * Facilitator assessment of appropriate level of engagement during sessions * Multiple choice knowledge test.   (Any incorrect answers to be reviewed via facilitated discussion during post-test debrief)  **Note:** Test should have sufficient questions to ensure participants have adequate understanding of all topics covered. Suggested pass rate is 80% | Training materials:   * Electronic Presentation Media * Fatigue/Ops Manual * White Board * CAO 48.1 * CAAP 48-1 |
| **Fatigue Knowledge** | **Notes** |
| 1. Sleep   Duration: 1hr (1x 50 min session with 10 min break) | Note: Suggested session timings only |
| 1.1 Sleep physiology   * Achieve an understanding of the physiological need for sleep: * Describe the process of the build-up of ‘sleep pressure’ while awake * Develop an awareness of average and individual minimum sleep needs * Describe the normal sleep process: * Achieve a basic understanding of sleep cycles and structure * Develop an understanding of the need for quality sleep: * Describe the impact of fragmented sleep on sleep quality. | Session 1 |
| 1.2 Circadian body clock   * Describe circadian rhythms: * Develop an understanding of the biological rhythms that affect alertness and sleepiness * Achieve an understanding of terms such as ‘Sleep gate’ and ‘Window of Circadian Low’ * Achieve an understanding of the impact of daylight on setting or resetting of circadian rhythms. | Session 1 |
| 1.3 Sleep disorders   * Develop an awareness of common disorders that may impact sleep quality or quantity including: * Sleep apnoea * Insomnia. | Session 1 |
| 1.4 Sleep debt and recovery   * Develop an understanding of how a sleep debt can occur: * Describe link between repeated minor sleep loss and substantial sleep debt * Describe how sleep debt must be repaid: * Develop an awareness of the potential need for multiple nights of recovery sleep to regain optimum performance. | Session 2 |
| 1.5 Shift work   * Achieve an understanding of the impact of shift-work on sleep and performance: * Describe how shift work can impact sleep quantity and quality * Develop an understand of how shift work can result in working at times of circadian lows. | Session 2 |
| 1.6 Jet lag   * Achieve an understanding of how trans-meridian flight can disrupt circadian rhythms: * Describe how international travel can leave an individual’s biological rhythms out of alignment with the local day (circadian dysrhythmia) * Develop an awareness of the rate at which individuals adapt to time zone changes: * Achieve an understanding of the potential effect of jet lag on performance before/while adapting. | Session 2  Note: Optional, not generally required for flying operations however if pilots travel for simulator training or personal reasons it might be of value. |
| 1. Fatigue   Duration: 1hr (1x 50 min sessions with 10 min break) | Note: Suggested session timings only. |
| 2.1 Understanding fatigue   * Define fatigue * Achieve an understanding of the types of fatigue: * Describe transient and cumulative fatigue. | Session 3 |
| 2.2 The causes and contributors to fatigue   * Identify major factors affecting fatigue including: * Time of day (circadian rhythm effects) * Recent sleep quantity and quality * Time awake * Time on Task * Nature of tasks * Environmental conditions * Hydration * Fitness * Food. | Session 3 |
| 2.3 Signs and symptoms of fatigue   * Identify the range of signs and symptoms associated with fatigue including: * Physical * Mental * Emotional. | Session 3 |
| 2.4 The consequences of fatigue on safety   * Understanding the impact of fatigue on the effective performance of tasks. | Session 4 |
| 2.5 High fatigue risk situations   * Be aware of the areas of human performance most affected by fatigue: * Develop knowledge of the type of tasks more sensitive to onset of fatigue related performance decrease. * Develop an understanding of environments and times of the day where fatigue is more likely to occur or to develop more quickly. | Session 4 |
| 2.6 The contribution of fatigue in accidents   * Appreciate the contribution of fatigue to incidents and accidents in the aviation environment: * Review international and Australian case studies of fatigue related aviation incidents and accidents. | Session 4 |
| 2.7 Recovery from fatigue  Understand sleep is the only way to recover from fatigue:   * Develop an understanding of the average time needed to recover from: * Transient * Cumulative fatigue. | Session 4 |
| 1. Countermeasures   Duration: 1hr (1x 50 min sessions with 10 min break) | Note: Suggested session timings only. |
| 3.1 Tailoring the sleep environment   * Describe setting up a bedroom or sleeping facility to aid in achieving quality sleep. | Session 5 |
| 3.2 Managing sleep habits   * Understand how to develop habits beneficial to quality sleep. | Session 5 |
| 3.3 Napping   * Describe the benefits of napping * Develop an understanding of how napping can reduce the impact of fatigue during duties * Describe effective napping techniques: * Achieve an understanding of controlling napping duration to reduce sleep inertia | Session 5 |
| 3.4 Exercise   * Describe how exercise can assist in mitigating the impact of fatigue. * Describe how increased fitness can improve individual resistance to the onset of fatigue. | Session 5 |
| 3.5 Nutrition and hydration   * Describe how appropriate nutrition and hydration can aid in mitigating fatigue. * Develop an understanding of food types and nutrition strategies that maintain energy without causing undue drowsiness. | Session 5 |
| 3.6 Caffeine   * Describe the effect of caffeine on alertness. * Develop an understanding of the benefits and limitations of the strategic use of caffeine to mitigate fatigue. | Session 6 |
| 3.7 Avoidance of alcohol before bed   * Be aware of the impact of alcohol on the quality of sleep: * Develop an understanding of appropriate consumption of alcohol to limit the impact on sleep quality. | Session 6 |
| 3.8 Use of sleep aids   * Describe common prescription and over the counter sleeping pills and sedatives. * Understand the use, limitations and risks associated with the use of sleep aids: * Develop an understanding of the health and performance effects of sleeping pills and sedatives. * Describe the concept of clearance times associated with the use of sleep aids. | Session 6 |
| 3.9 Avoidance of nicotine   * Develop awareness that nicotine is a stimulant that may impact ability to sleep. | Session 6 |
| 3.10 Keeping a sleep log   * Discuss the limitations of informally tracking sleep quantity and quality: * Develop an awareness of the potential for overestimating sleep. * Discuss the use of a structured sleep log to accurately record sleep quantity and quality: * Identify the structure and content of an appropriate log to aide recording of sleep information. * Develop an appreciation of the benefits of a sleep log in identifying negative habits or repeated minor sleep deficits and in forming beneficial sleep habits. | Session 6 |
| 1. Company fatigue management procedures   Duration: 1hr (1x 50 min sessions with 10 min break) | Note: Suggested session timings only. |
| 4.1 Fatigue Risk Management Policies   * Develop an understanding of organisational fatigue risk management policies appropriate for the individuals’ position and duties. | Session 7 |
| 4.2 Application of Flight and Duty Limits   * Ensure an understanding of the application of organisational flight and duty time limits. | Session 7 |
| 4.3 Fatigue Management processes and procedures   * Develop a working understanding of organisational fatigue management procedures and processes (including proper use of forms). | Session 7 |
| 4.4 Extension policy and procedures   * Understand the application of organisational policy and procedure for extensions (and exceedances). | Session 8 |
| 4.5 Flight Crew Members’ obligations   * Develop an awareness of the pilot’s obligations regarding individual fatigue management. | Session 8 |
| * 1. Rostering and recording system * Understand the use of the organisation’s rostering and recording system. | Session 8 |

### Fatigue hazard identification

<XXXX> will undertake fatigue hazard identification and management, to ensure that pilots can safely operate an aircraft or perform safety related duties and minimise any fatigue risk.

The fatigue hazard identification follows through three phases and will be an ongoing process. It will also be used to determine adjustments to prescriptive limits to suit <XXXX>’s operations and circumstances (which will not in any case exceed Appendix 2 limits). Any proposed operations will be subject to the fatigue hazard identification process before pilots will be permitted to conduct the operation. The process may also determine other controls that can be used to minimise fatigue risks.

<XXXX> will undertake the following hazard identification and risk management phases:

#### Initial hazard identification

<XXXX> will identify fatigue hazards that could potentially cause harm to the health and safety of people or damage to plant and equipment. <XXXX> will work with pilots and other staff to identify fatigue hazards that may occur within the following situations:

* work tasks & how performed (e.g. rostering practices, flying without an autopilot)
* physical work environment (e.g. hot weather conditions)
* use of equipment, material (e.g. NVG operations)
* work design and management (e.g. low level flying or limits for newly qualified pilots).

<XXXX> may use a number of methods to assist in the process of identifying fatigue hazards and these may include one or more of the following:

* pilot’s input from their experience of particular types of operations
* any fatigue problems brought to the attention of the Chief Pilot (or delegated person)
* information from Flight and Duty records, including fatigue reports, extension reports and any reported exceedances
* consulting with colleagues/discussion
* review of standards, procedures and systems (including observations)
* staff surveys or questionnaires (if conducted)
* external sources (such as industry specific knowledge sources and industry groups)
* details from external audits/safety assessments.

<XXXX> will take action to minimise or eliminate fatigue risk ‘as low as reasonably practicable’. Information gathered through this phase and the following two phases will be used to populate Table 11 (or an equivalent).

Column 1 in Table 11 details the hazards identified by the above steps. Any existing controls (such as legislation) will be entered into the table (column 2). This column will also include any other controls that could reasonably be considered as acting to manage the fatigue risk such as workload on the ground, the temperature, noise and vibration, hunger and hydration. Column 3 designates whether the hazard is still present and / or reduced.

Further risk management controls (especially limit adjustment) to manage the risk “as low as reasonably practicable” will be found in column 4. It is important to consider any informal controls that are being used and consider whether they need to be made more formal (documented) as an additional control to ensure they are reliably applied. The information in column 4 should then be considered for adequacy and a decision made as to whether any limits such as those in in Section 1.2.3 Duty time FDP, flight time and Cumulative limits need to be adjusted. Column 5 designates whether the hazard remains and/or is further reduced with the mitigation(s).

To ensure monitoring and evaluation of the risk management procedures, a responsible person will be assigned for each entry and any further policy or practice considerations will be entered into column 6.

The major outcome of this initial phase is to identify hazards and recommend any mitigations required.

**Incidents:** <XXXX> will analyse reports received through the incident and/or fatigue occurrence or extension reporting systems for root causes (the ‘why’ of a situation).

The results of this analysis may identify new fatigue hazards or lead to amending existing fatigue risk mitigation.

These results must be entered into Table 11 (and may have a reference linking them back to the specific report).

(Refer Sections 1.2.13 Reporting and 1.2.13.2 Extensions).

**Annual Review and Significant Change:** At this time the fatigue management approach (including hazard identification and risk mitigation) is reviewed and amended where necessary. Refer to Section 1.1 Fatigue management policy.

<XXXX> will meet with all pilots and staff (or provide a way for their input into the process) every 12 months (at a minimum) and will discuss:

* a summary of fatigue reports including specific mention of more significant reports and all hazards identified and mitigation actions since the last review
* fatigue Risk Management controls – general review of adequacy
* review all limits (as defined in Section 1.2.3) as set by <XXXX> - review adequacy
* accommodation – any issues or required improvements
* extension Reports – review procedures and improvement recommendations that could be made
* communication Protocols – improvement recommendations
* hazard Identification process – review adequacy.

This review will also occur when there are significant operational changes including those affecting rostering, the introduction of new aircraft types, new operational areas or routes, new training methods or the introduction of new technology.

Records from the Fatigue Hazard Identification Phases and associated reviews will be kept with the flight and duty records (Section 1.2.12 Recording flight and duty times).

The table and analysis form part of the Flight and Duty Records.

Table 11 Fatigue hazard identification section

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Identified fatigued hazard (date recorded) | Existing controls | Hazard still present Yes/No/Diminished? | Additional mitigations | Hazard still present Yes/No/Diminished? | Responsible person and policies and practice considerations |
| Insufficient or disrupted sleep prior to duty period | Report fatigued  Fatigue Training | Yes | Controlled rest  Caffeine | Diminished. | Operations Manager to monitor fatigue reports. FCM survey to be conducted 6 months after the additional mitigations are introduced. |
| Extreme  temperatures/ humidity | Cockpit climate control  Fatigue Training | Diminished | Rest intervals between sectors conducted in air-conditioned rest facilities  Encourage regular hydration with electrolyte drinks | Diminished to acceptable levels  Hazard for operations in high temperatures does not exist for operations between April and November (base specific) | Head of Maintenance to monitor levels of aircraft climate control unserviceability’s |
| High noise levels | Mandatory use headsets (Ops manual ref XXXX) | Diminished | Upgrade headsets to be noise cancelling | No – noise reduced to normal range | Chief Pilot – amend Ops manual policy |
| Flight within Instrument meteorological conditions (IMC) or at night | CAR 217 training and checking  Part 61 If recency requirements | Diminished | Autopilot must be serviceable or two crew  Increase If recency requirements to XX hours every XX days | Diminished to acceptable levels | Head of Maintenance to monitor levels of autopilot unserviceability’s  Chief Pilot to make system changes to monitor new recency recording |
| Automation not available.  For example:  No Autopilot | Appropriate training | Diminished | Increased rest intervals between sectors.  Reduce night flying to less than XXX per FDP | Diminished to acceptable levels | Head of Maintenance to monitor levels of autopilot unserviceability’s. |
| Consecutive WOCL duties causing fatigue | Limit of 3 Consecutive WOCL duties per 7 days  fatigue training | Yes | Max Limit of two consecutive WOCL duties per 7 days  Increased ODP  Controlled rest  Caffeine  Sleep monitoring | Diminished to acceptable levels | Operations Manager |

**Notes:**

1. The entries in the above are just examples to provide some explanation of what might be required to manage fatigue risk in the Operator’s operations. Any adjustment to a limit would need to be reflected in the appropriate place in the fatigue management limits and CASA notified of the change. Operators do not need to wait for a response from CASA before operating to the new limit. Operators can make such changes whenever they feel it is required as long as they do not exceed a limit in CAO 48.1 Instrument 2019 (in this case Appendix 5).

2. The hazard identification and mitigation process would be contained in the SMS for those operators operating within an SMS and this section should refer to the applicable section of the SMS.

3. For those without an SMS CAAP 48-1 Appendix F provides examples and guidance in this area.

4. Table 11 or similar, may be captured and stored elsewhere and referred to in this manual so as to avoid the need to notify of minor updates.

### Flight and duty records

Flight and Duty Records include all details relevant to the rostering and fatigue management system and specifically include:

* rosters planned and achieved
* fatigue Occurrence Reports
* incident Reports that involve fatigue
* analysis or reports, actions and conclusion stemming from fatigue related investigations
* extension/exceedance reports
* notifications from pilots of unavailability due to fatigue (if not resulting in a Fatigue Occurrence Report)
* the results of annual review of the fatigue management system
* the results of Fatigue Hazard Identification and Mitigation reviews
* training and Assessment Records relating to the Fatigue Management System
* the list of suitable sleeping accommodation
* completed alertness consideration tables
* any other unique arrangements (e.g. prior sleep opportunity arrangement).

All flight and duty records (including the rostering and recording system) will be backed up at least weekly and records (including electronic records) shall be kept for 5 years. Backups and archived records will be stored off site <at xxxx> to mitigate loss risk.

**Notes:**

1. This should be expanded to include company specific details on who, what, where, when and how records are kept. Items/processes such as backing up to the cloud, stored at facility x by admin etc., would be in here.

2. This section should be specifically referenced in the general section on record keeping/retention periods if appropriate.

## Conditions and processes for extensions to limitations

### Extensions

An FDP or flight time extension will only be authorised where other possible solutions to operational issues are unavailable.

Only the Chief Pilot (or delegated person/s) can authorise an extension to an FDP or flight time limit. To do so the Chief Pilot (or delegated person/s) will consider:

* increased operational risks including:
  + impacts from increased sectors and/or workloads
  + environmental factors including weather and temperature
  + aircraft serviceability including MEL items (such as autopilot unserviceability).
* potential for ‘get-home-itis’ or some other, non-essential factor to be motivating the pilot to request the extension
* availability of assigning alternate pilots
* possibility of sortie cancellation or modification
* any patterns of extension
* future rostering or planning implications of the extension
* opportunities for duty rest.

An FDP can only be extended if:

* the pilot or pilots considers themselves fit for the extended FDP. They should undertake an alertness consideration review as per Form ACTab and agree to the extension via the communication protocol

**Note:** Where possible the pilot or pilots should discuss their fatigue level with a third party, who knows about the signs and symptoms of fatigue, before reaching a decision on their fitness for the extension.

* the pilot or pilots has had sufficient time to consider their fatigue levels and agree to the extension.
* the FDP is extended by no more than 2 hours
* cumulative flight time limits are not exceeded
* the pilot’s minimum ODP will be increased by 1 hour for every 30 minutes or part thereof that the pilot or pilots extends over the FDP limit.

If unforeseen operational circumstances arise after take-off on the final flight of an FDP; and those circumstances would cause a pilot to exceed any flight and duty time limit then, the pilot can continue to the planned destination or alternate at their discretion as dictated by the safety of passengers and crew. In these circumstances, if limits are exceeded, it is called an exceedance and must be reported and recorded in the same manner as an extension.

An extension to an FDP that results in the pilot finishing an FDP after midnight is not considered an LNO.

Extensions and exceedances require an Extension Report (Form ER) to be completed in accordance with the reporting provisions in Section 1.2.12 Reporting and must also be recorded in the hazard identification and mitigation system (refer also Section 1.2.16 Fatigue hazard identification).

The report will also form part of the flight and duty records.

Extensions will be reviewed by the Chief Pilot (or delegated person) as part of <XXXX>'s continuous improvement system (refer also Section 1.2.16 Fatigue hazard identification) and the analysis will be stored as part of the flight and duty records.

**Note:** Reference should be made here to the operators SMS if they have one.

# Rostering in accordance with flight and duty time policy

The Chief Pilot (or delegated person/s) is responsible for preparing and publishing the roster. The roster will be planned on a 28-day basis and published 7 days before the beginning of the roster period. The roster will be amended and republished as quickly as possible if any changes are made. Any pilot affected by the changes will be notified in accordance with the communication protocol.

## Operations under multiple appendices

**Note:** If not operating under multiple appendices this section should be removed.

Before a pilot is assigned an FDP where they must combine two different CAO 48.1 appendices within the one FDP the following applies:

* check that the pilot is within the cumulative duty and flight time limits for the new appendix
* the maximum FDP and flight time limits are those contained in the appendix under which the operation is being conducted at that particular time, the limits being determined based on the commencement of the FDP not on the time of commencement of operations under each appendix
* at any particular time in an FDP the pilot must remain within the cumulative duty and cumulative flight time limits for the appendix under which the operation is being conducted at that particular time
* to establish the minimum off-duty period that the pilot must be assigned following the FDP the minimum ODP is worked out as if the pilot worked the whole FDP under each appendix. The highest of these off-duty periods is then the minimum ODP and must be completed prior to commencing an FDP under any appendix.

Before a pilot is assigned an FDP under a different appendix the pilot will complete any off-duty period requirements resulting from conducting a previous FDP.

Before transferring from an aerial work appendix to any other appendix, the following requirements apply:

* the pilot must have had at least 7 days off-duty in the 28 consecutive days before commencing the FDP or standby
* the pilot must have had at least 24 days off-duty in the 84 consecutive days before commencing the FDP or standby
* complete half as many days as would otherwise be required for that pilot to meet the requirement for 24 off-duty days in the preceding 84 days—rounded up to the nearest whole number.

**Note:** If this option is chosen, the pilot must first complete a consecutive number of off-duty days equal to half the number of days they are short of the 24 off-duty days in 84 day requirement (rounded up) then check whether they have met the 28 day requirement.

**Example 1:** (refer table 12) If the pilot had 5 off-duty days in the preceding 28 days and 16 off-duty days in the preceding 84 days then they would need to complete a period of consecutive 4 off-duty days (i.e., 24-16 = 8; half of 8 equals 4 off-duty days). In this case, completing the 4 days off-duty means that the pilot then also meets the requirement for 7 off-duty days in a 28-day period and is clear to transition.

Table 12 Example 1

|  |  |  |
| --- | --- | --- |
| **Example 1** |  | |
|  | Days |  |
| Requirement Period | 28 | 84 |
| Required off-duty days | 7 | 24 |
| Actual off-duty days | 2 | 16 |
| Deficit (days) | 5 | 8 |
| Half 84-day requirement (rounded up) |  | 4 |
| Off-duty days required to transition | 4 | |

**Example 2:** (refer table 13) If the pilot had 2 off-duty days in the preceding 28 days and 17 off-duty days in the preceding 84 days then they would need to complete a period of consecutive 5 off-duty days. While the 84 day requirement can be met with 4 off-duty days (i.e., 24-17 = 7; half of 7 equals 3.5; rounded up is 4 off-duty days), completing the 4 days off-duty means that the pilot then still requires an additional day to meet the requirement for 7 off-duty days in a 28 day period. Therefore, they would need to complete a period of consecutive 5 off-duty days before being clear to transition.

Table 13 Example 2

|  |  |  |
| --- | --- | --- |
| Example 2 |  |  |
|  | Days |  |
| Requirement Period | 28 | 84 |
| Required off-duty days | 7 | 24 |
| Actual off-duty days | 2 | 17 |
| Deficit (days) | 5 | 7 |
| Half 84-day requirement (rounded up) |  | 4 |
| Off-duty days required to transition | 5 | |

**Note:** If there is any question regarding the suitability of this minimum period when employed in the operator’s context, then they should monitor the fatigue levels of pilots and increase this minimum period if required. An example of a way an operator could do this is via surveys or regular meetings to discuss fatigue with the pilots involved (the effectiveness of this approach would depend on the safety culture evident in the organisation at the time).

1. Fatigue occurrence report (Form OR)

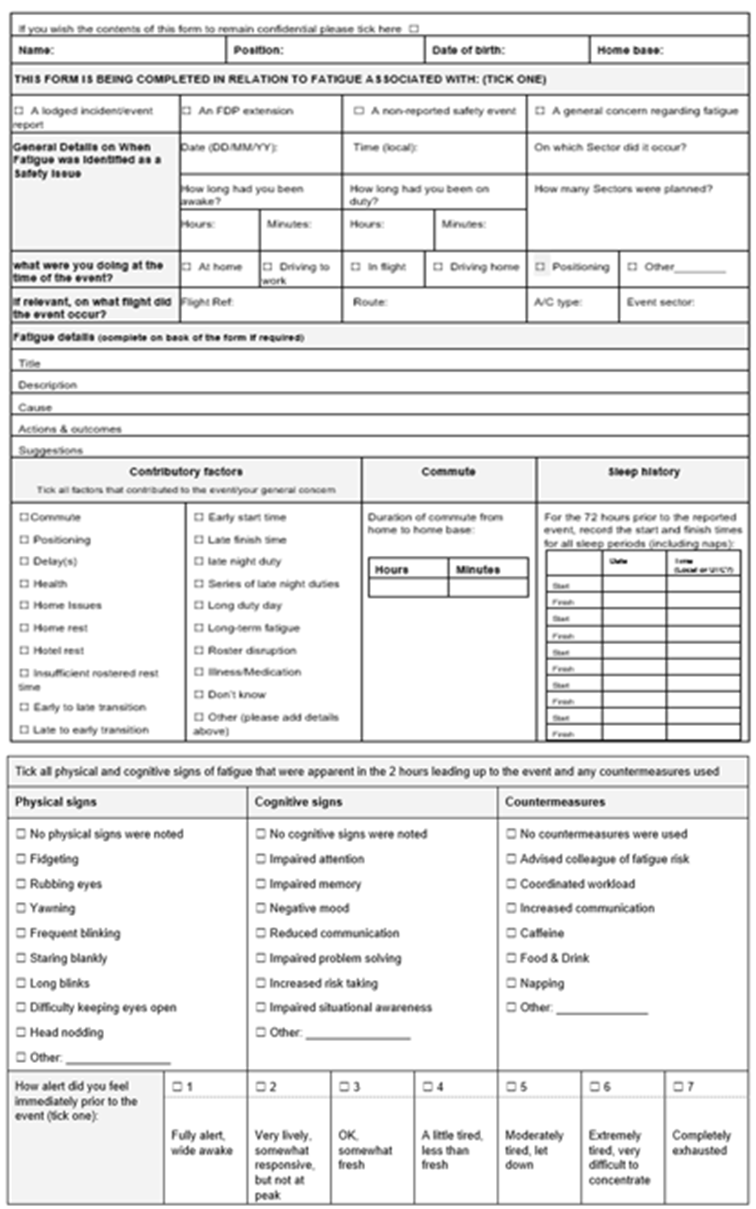


Figure 1 Fatigue occurrence report (Form OR)

1. Alertness consideration table (Form ACTab)

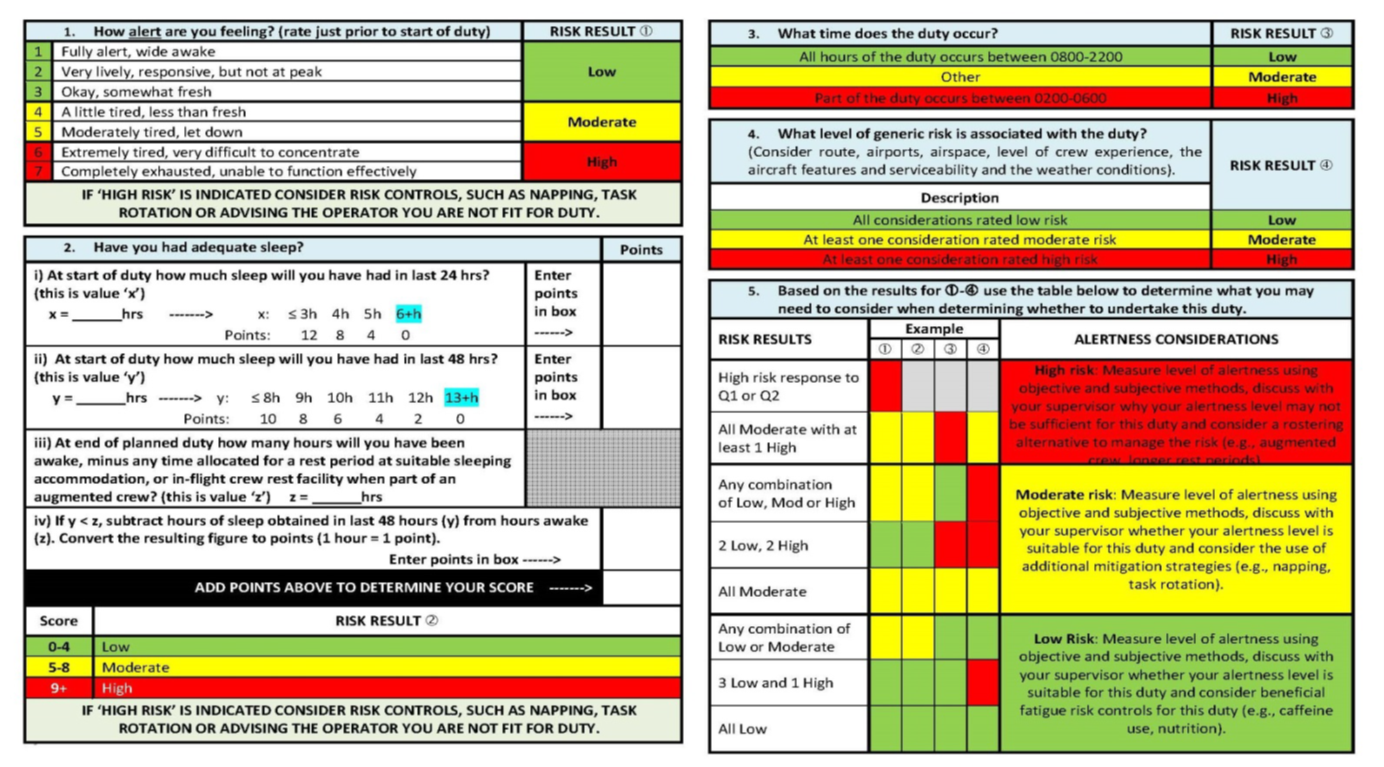


Figure 3 Alertness consideration table (Form ACTab)

* 1. Instructions for using the ACTab prior to duty

**Q1. How alert are you feeling?**

Question 1 involves the FCM rating their current alertness (ideally close to their report time) using one of the seven options on the alertness scale. The result falls into one of three bands of risk – Low, Moderate, or High.

If High Risk, the FCM must consider discussing this with other employees or the Chief Pilot (or delegate) and may need to address the risk through applying previously defined risk control measures, such as extended rest periods or task rotation. If a decision is made to continue with the duty, proceed to Question 2.

**Q2. Have you had adequate sleep?**

Question 2 involves the FCM accruing points based on their sleep in the prior 24 hours, 48 hours, and hours wake at the end of the duty. The points sum to produce a final score, which is categorised in terms of risk as Low, Moderate, or High.

Note: 48 hours is used in this table, because the table focuses almost entirely on acute or transient fatigue and the assumption is that the pilot was well rested prior to this point. If the pilot has a longer period of disrupted or restricted sleep then they should consider that the cumulative fatigue associated with this, will increase the fatigue risk. An increased cumulative fatigue will increase the risk associated with subsequent, shorter than required, sleep periods identified in the table and FCMs should put more weight on any symptoms (response to question 1) and take a more conservative approach to any heightened risk identified by using this table.

If the result is High Risk, the pilot must consider discussing this with other employees or the Chief Pilot (or delegate) and may need to address the risk through applying previously defined risk control measures, such as extended rest periods or task rotation. If a decision is made to continue with the duty, proceed to Question 3.

**Q3. What time does the duty occur?**

Question 3 involves the pilot classifying their duty based on the time of day that the duty occurs. The result falls into one of three bands of risk – Low, Moderate, or High.

They then continue to Question 4.

**Q4. What level of operational risk is associated with the duty?**

Question 4 involves the pilot classifying the level of operational risk associated with the duty.

It is understood that the accumulation of fatigue will eventually diminish performance and increase error rate, to the point where the pilot becomes ‘fatigue impaired’, or simply too tired for the job intended. Aviation systems should be able to tolerate some human error and diminished performance capability, but very often task demands can increase, due to unforeseen circumstances. Consequently, what was previously acceptable in terms of an acceptable performance/error level, now becomes unacceptable.

Fatigue risk interacts with other areas of human performance, such as workload and task complexity and all of these risks need to be considered and if necessary, addressed.

For fatigue risk, pilots should consider what factors are associated with the tasks allocated to them prior to presenting as fit for duty. This is because it has been well researched that reduced alertness (or the accumulation of fatigue) impacts on ‘real world skills’. Pilots, other employees and the Chief Pilot should consider fatigue risks that may be present in conjunction with other risks, such as the type of task being undertaken, the nature of the airspace, weather considerations, airport demands and aircraft serviceability.

Furthermore, all should recognise that tasks that involve cognitive performance (e.g., decision making, memory capacity) and threat and error management can potentially be poorly measured or mismanaged by a FCM who is fatigued.

Using ACT, the pilot continues to the final step, in order to assist their determination of whether they may have adequate alertness to undertake the duty.

**Determine the fatigue risk level and what may need to be considered when determining whether to undertake this duty**

Based on the results for Questions 1-4, the pilot can use the table provided to determine whether a fatigue risk may be present during this duty. Together with measured levels of alertness, FCMs can begin discussing how to manage possible risks with the Chief Pilot (or delegate) and subsequently develop an effective risk management plan.

Sleep requirements [note for user]

Whilst it is easy to understand that adequate sleep is a prerequisite for an alert flight crew member, the notion of what adequate sleep consists of is subject to individual variability and this is further complicated by how easy it is to overestimate the amount and quality of sleep we actually get. As a general guide an individual who was previously well rested prior to the 48 hour window requires at least 6 hours sleep in 24 hours, and 13 hours in 48 hours.

An individual can develop section 2 of the ACTab Form to suit themselves. The blue highlighted numbers in section 2 can be individualised, and consequentially, the numbers to the left should be reduced by 1 hour from the number to its right. A good place to start is for an individual understanding how much sleep is needed to feel well rested. This may be ascertained after a day or two of waking normally (to dissipate any accumulated sleep debt). Once this figure is recognised, then a basis is formed for suggesting what reduction from this figure over a 24 and 48 hour period may lead to the risk rising until the accumulated sleep debt becomes too much. As a general guide, if starting from a well-rested state, less than 13 hours sleep in the last 48 hours and 6 in the last 24 hours should be considered significant.

It must be emphasised that the figures in this section of the tool can be tailored to account for individual needs.

1. Extension report (Form ER)

A screenshot of a form

AI-generated content may be incorrect.

Figure 4 Extension report (Form ER)