



Australian Government
Civil Aviation Safety Authority

MODERNISING AUSTRALIA'S FATIGUE RULES



CASA response to the independent review recommendations

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Executive summary

The CASA Board commissioned an independent review of Australia's fatigue rules for operators and pilots in 2017, to provide an informed basis for CASA to continue with a reform of the rules.

The independent review team, assembled by Dédale Asia Pacific, delivered its final report in March 2018. The report confirmed the need to modernise Australia's fatigue rules and provided 24 recommendations to improve the rules. These have been carefully considered by industry and CASA.

CASA conducted public consultation on the recommendations between 21 March and 22 April 2018 on CASA's Consultation Hub¹. Twenty-six responses were received from industry, including major airlines, operator associations, pilot associations and individuals, and CASA staff. Where permission has been granted, responses have been published on CASA's Consultation Hub².

The Aviation Safety Advisory Panel appointed a Technical Working Group to review industry feedback and CASA's proposed responses in July 2018. The Technical Working Group comprised representatives of operators, pilot associations, industry associations and academia. Industry feedback and the Technical Working Group broadly supported the need to modernise Australia's fatigue rules along with the review team's recommendations and CASA's proposed response; however, there were dissenting views on some issues³.

CASA accepts 21 of the review team's 24 recommendations. Two of the recommendations were identified as unnecessary subject to successful implementation of other recommendations. One recommendation was identified as overly restrictive to industry and an alternate approach is proposed. CASA has developed an action plan to address the 24 recommendations and additional issues raised during public consultation and by the Technical Working Group.

CASA identified 54 actions that will be accomplished in four phases to address the review team recommendations.

Phase 1 includes the immediate action required to remove the 31 October 2018 deadline. The new deadlines will be 30 September 2019 for 19 high capacity regular public transport (RPT) operators under CAO 82.5 and 26 March 2020 for all other operators. Phase 1 will be completed as soon as possible.

Phase 2 includes releasing amendments and guidance material required to support transition of high capacity RPT operators. Phase 2 is planned for completion in 2018.

Phase 3 includes releasing amendments, related guidance material, sample documentation and training required to support transition of all other operators. Phase 3 is planned for completion in the first half of 2019.

Phase 4 includes ongoing actions that are not expected to be completed during earlier phases.

CASA will seek confirmation from the Aviation Safety Advisory Panel prior to closing actions and recommendations.

¹ <https://consultation.casa.gov.au/regulatory-program/fatigue-review-final-report/>

² https://consultation.casa.gov.au/regulatory-program/fatigue-review-final-report/consultation/published_select_respondent

³ <https://www.casa.gov.au/about-us/standard-page/cao-481-twg-fatigue-rules-operators-and-pilots>

Based on advice from the Technical Working Group, the Aviation Safety Advisory Panel is generally supportive for CASA to progress with drafting the revised CAO 48.1. The Aviation Safety Advisory Panel recommend an additional Technical Working Group meeting to review the drafted regulations and seek to achieve further consensus on outstanding policy matters prior to further public consultation.

The CASA Board is satisfied that CASA's response strikes an appropriate balance between safety and impact on industry and expects that industry will work with CASA to transition to the modified rules.

Key findings and recommendations

The independent review team found that scientific knowledge about fatigue and its effects on human reliability suggest a significant potential risk that needs to be properly managed. CASA's objective to protect the aviation industry and travelling public from all intolerable risks associated with pilot fatigue is logical, and consistent with the principle of developing regulations designed to address known or likely safety risks.

The team found that prescriptive limits in some areas of CAO 48.1 are conservative when compared with similar international jurisdictions and that the requirements in relation to fatigue risk management systems are expressed in an overly prescriptive tone.

The industry Technical Working Group agreed that the independent review had established that there is a need for change from the rules under CAO 48.0 and the Standard Industry Exemptions and that the suggested improvements to prescriptive limits, and making FRMS accessible to small operators combined with a fee waiver for FRMS assessment during transition would address industry concerns regarding the potential for cost increases.

The final report of the independent review team offered 24 recommendations for consideration. This response to the independent review addresses each recommendation in detail including CASA intended actions to close each recommendation.

Recommendations

Recommendation 1 - Agreed definition for fatigue related safety occurrences

That CASA collaborates with the Australian Transport Safety Bureau (ATSB) to develop an agreed definition of a 'fatigue-related safety occurrence', in order to generate and publish more definitive data on fatigue related safety events in the Australian aviation industry.

Consultation feedback

Respondents strongly supported this recommendation and suggested that CASA include industry in the development of an agreed definition in order to generate and publish more definitive data on fatigue-related safety occurrences.

The Technical Working Group recommended that CASA routinely conduct industry fatigue surveys to establish a baseline and monitor the impact of regulations. The group also suggested CASA develop additional guidance to acknowledge that fatigue reporting rates may increase as reporting culture improves. These suggestions are addressed by Actions 25-1 and 25-2.

CASA response

Action 1-1 Fatigue Assessment

CASA will form a working group with ATSB and selected industry participants to develop a definition and methodology for reporting and assessing fatigue within safety incidents and occurrences.

Recommendation 2 - Approved variation process

That where an operator chooses to conduct its operations under a specific Appendix, other than Appendix 1 (prescriptive limits) or Appendix 7 (FRMS), CASA amends Appendices 2 to 6 to provide operators some limited scope for flexibility with respect to compliance with the rules using a standardised approval process. This process will enable CASA to show that it considers fatigue mitigation to be appropriate relative to the risk exposure profile.

Consultation feedback

Respondent feedback regarding this recommendation was mixed. Some respondents argued that the proper mechanism for providing flexibility was under an FRMS. Those in support of this recommendation argued that operator performance under the old fatigue limits demonstrated a level of safety that could support the recommended provisions. There was a general consensus that the flexibility proposed would need to be managed by consistently applied policy with clear safeguards against acceptance of increased risk without adequate controls.

The industry Technical Working Group recommended that this recommendation should not be implemented at this stage due to planned improvements to both the prescriptive limits and FRMS scalability.

CASA response

CASA accepts the Technical Working Group advice and will not implement this recommendation at this stage.

Action 2-1 Review need for approved variation process

On completion of recommendations 3 and 5 CASA will seek further advice from the Aviation Safety Advisory Panel regarding the need for an approved variation process.

Recommendation 3 - International alignment of flight duty periods

That, notwithstanding any challenges the Australian operating environment may present, CASA adopts prescriptive FDP limits that are more closely aligned with international averages for similar types of operation.

Consultation feedback

Feedback on this recommendation was mixed. Some respondents suggested that CAO 48.1 should be repealed and the previous fatigue rules should be retained. Others suggested that the use of international averages doesn't provide an adequate scientific basis for setting prescriptive fatigue limits. Respondents highlighted that examination of prescriptive flight duty period limits in isolation overlooks other mitigations within international rulesets. Further feedback indicated that prescriptive limits provide an overly restrictive approach to fatigue management and that a more data driven approach is necessary.

The industry Technical Working Group reviewed CASA's proposed amendments to the prescriptive limits in Appendices 2 and 3; the proposed limits were adjusted based on feedback from the group. General consensus was achieved that the proposed limits incorporated fatigue science principles regarding the impact of time of day, length of duty and workload while seeking closer alignment with the international averages identified in the independent review. The modified limits also address the specific concerns identified in an Australian pilot fatigue survey regarding early starts. The alignment with international averages was supported by the Technical Working Group as the Australian environment is considered to pose lower risks associated with terrain and weather combined with lower traffic volumes in comparison with other regulators.

Some Technical Working Group members expressed dissenting views that adoption of averages without considering the additional mitigating factors within those rulesets was flawed. Some members did not accept that the other regulators represented best practice due to compromises made in the rule development process. Some members proposed that CASA should retain the limits in CAO 48.1 Instrument 2016 or that if change was inevitable that CASA should not exceed the example limits provided by the independent review team. These members proposed that any need to operate outside the current limits could be facilitated by a fatigue risk management system.

There was a further dissenting view that it is unacceptable to accept a greater likelihood of fatigue risk for aerial work operations in comparison to passenger carrying operations.

The Technical Working Group discussed whether flight time limits combined with flight duty time limits provided additional fatigue mitigation in comparison to the additional management complexity they imposed. There was general consensus that flight duty time limits provide adequate mitigation and that managing both flight time and flight duty is more complex and can lead to unintended scheduling outcomes. There were dissenting views that a single flight time limit should be prescribed for each operation type. There were also dissenting views that the current structure of flight time limits should remain.

The Technical Working Group recommended that CASA continue to monitor international trends and the results of monitoring fatigue data; this is addressed by action 25-4.

The Technical Working Group discussed start time windows and related limits for augmented crew operations. Some studies have demonstrated a propensity to sleep and wake based on homeostatic drive and societal norms regardless of rostering patterns. Conversely, anecdotal experience indicates that later start time windows might promote improved in flight rest due to alignment with natural circadian lows. CASA will review augmented crew start time windows and duty periods under action 25-5.

The Technical Working Group discussed the results of a survey of 1,132 Australian commercial pilots⁴. Consecutive early starts and switching from early to late starts were identified as frequent concerns, which align with scientific understanding of the window of circadian low and circadian dysrhythmia. This issue will be addressed by action 25-6.

CASA response

CASA acknowledges the various Technical Working Group views regarding the use of international averages. The proposed limits developed in conjunction with the Technical Working Group more closely align with international averages whilst continuing to address the following factors impacting fatigue risk:

- Fatigue increases as time awake increases – Maximum FDP seeks to limit time awake
- Fatigue increases as time at work increases – Maximum FDP seeks to limit time at work
- Early starts impact quality of sleep and subsequent alertness – Decrease FDP for early starts
- Alertness is impacted by time of day – Decrease FDP for duties over the WOCL
- Sleep obtained during the day will likely be lower quality – Decrease FDP for late starts
- Fatigue increases with increasing workload – Decreasing FDP as sectors increase

CASA is regulating aviation safety to accept lower risks to passenger transport where participants are not reasonably aware of the risk, nor have control over the risk. CASA accepts higher risk for aerial work operations as the crew are informed participants and can reject or cease the tasking if they assess the fatigue risk to be unacceptable. CASA acknowledges that commercial pressures and pilot capability to self-assess fatigue support a need to retain prescriptive limits.

CASA intends to retain the prescriptive limits for flight duty period within CAO 48.1 Instrument 2016 Appendices 1, 4, 4A, 4B, 5, 5A and 6.

⁴ <https://www.afap.org.au/news1/ArtMID/1606/ArticleID/103/uns-w-fatigue-survey-report>

CASA RESPONSE TO THE INDEPENDENT REVIEW RECOMMENDATIONS

Appendix 1 (tier 1) provides simple and conservative limits that can be easily adopted by small operators. Appendices 2 to 6 (tier 2) generally allow higher limits due to additional organisational mitigations including risk management, continuous monitoring and fatigue training. Organisations should select their specific limits within the prescriptive limits with regard to their individual circumstances.

Appendix 2 and 3 provide higher limits due to workload and other risk mitigations associated with multi-pilot operations in comparison to Appendix 4. Appendix 4B permits higher limits for operations related to medical transport and emergency services in recognition that the additional fatigue risk is balanced by a non-aviation risk that the flight seeks to mitigate.

Appendices 5 and 5A permit higher limits for aerial work in recognition that there is a lower acceptable likelihood of fatigue in passenger carrying operations than aerial work. This is, in part, due to the personnel at risk during aerial work being more aware of risks and able to control acceptance of the risk and partly due to the higher risk consequence associated with multiple fatalities.

CASA intends to amend the prescriptive limits for flight duty period within CAO 48.1 Instrument 2016 Appendices 2 and 3 in accordance with Table 1.

Start Time/Sectors	1-2	3	4	5	6	7+
0500-0559	11.5	11	11	10	10	9.5
0600-0659	12	12	11	11	10	9.5
0700-0759	13	12.5	12	11.5	11	10.5
0800-1059	13	13	12.5	12	11	11
1100-1359	13	12	12	11	11	10
1400-1459	12	11.5	11	10.5	10	9.5
1500-1559	12	11	11	10	10	9
1600-2259	11	10	10	9.5	9	9
2300-0459	10	9.5	9	8.5	8	8

Table 1 – Flight Duty Periods Acclimatised Flight Crew

CASA intends to simplify the management of flight time and flight duty periods by removing flight time limits from each of the prescriptive limits tables and establishing a single flight time limit for each appendix in accordance with Table 2.

Appendix	Description	Flight Time Limit
6	Flying Training	7
4	Single Pilot	9
4B/5	Single Pilot - Medical Transport, Emergency Services, Aerial Work	10
2/3	Multi Pilot	10
4B	Multi Pilot - Medical Transport, Emergency Services	11
3	Augmented + 1	14
3	Augmented + 2	16

Table 2 – Flight Time Limits

Action 3-1 Amend prescriptive limits

CASA will amend the prescriptive flight duty period limits in Appendices 2 and 3 in accordance with Table 1 and provide a single flight time limit for each Appendix in accordance with Table 2.

Recommendation 4 - Multiple tiers of FRMS

That CASA creates at least two risk-based tiers of FRMS requirements (to be reflected in FRMS application/assessment materials such as Form 817), with the highest level of FRMS requirements to be applied to Part 121 passenger and cargo transport operations.

Consultation feedback

Feedback on this proposal was mixed due to the interaction between this recommendation and recommendations 2, 3, 5, 6, 16, 22, 23 and 24. Some respondents supported multiple tiers but questioned if the future Part 121 (commercial air transport - large aeroplanes) criteria was appropriate. Other respondents expressed concern that multiple tiers were unnecessary for outcome-based legislation that should scale appropriately to the operation, and that the existing ICAO standards do not preclude scalability. The industry Technical Working Group recommended that promoting a scalable FRMS negated the need for a two-tier system. Further industry feedback on FRMS is addressed under recommendation 5.

CASA response

CASA accepts the Technical Working Group advice and will not implement this recommendation at this stage. The FRMS requirements and guidance will be modified to produce a single process that can be scaled to organisation size and risk.

Action 4-1 FRMS scalability

CASA will modify the FRMS requirements and guidance to produce a single FRMS process that is appropriately scaled to organisation size and risk.

Action 4-2 Review need for multiple tier FRMS

On completion of recommendation 5 CASA will seek further advice from the Aviation Safety Advisory Panel regarding the need for a multiple tier FRMS.

Recommendation 5 - Reduce FRMS level of prescription

That CASA reduces the level of prescription in CAO 48.1 Appendix 7 to align more closely with an outcome-based regulatory philosophy.

Consultation feedback

A majority of respondents supported this recommendation. The industry Technical Working Group discussion of this recommendation resulted in several actions to improve the operation of FRMS. Additional feedback and CASA response is provided below with the related action.

CASA response

CASA will implement several actions to improve operation of FRMS.

Action 5-1 FRMS change management process

CASA will incorporate an FRMS change process based on the draft CASR Part 119 significant change process.

Note: Changes to increase maximum duty limits or decrease off duty periods would be considered a significant change in line with ICAO Standards and Recommended Practices.

Action 5-2 FRMS sample manual and AMC

CASA will develop a sample FRMS manual to be made available in CASA's Manual Authoring and Assessment Tool with multiple examples of acceptable means of compliance (AMC) to demonstrate an appropriate level of detail to operators and CASA inspectors.

Note: The development of a sample FRMS manual and incorporation of this sample into the Manual Authoring and Assessment Tool will still require operators to assess the fatigue risks and mitigations relevant to their specific operation. The sample manual will be aimed at smaller operators.

CASA will also publish additional acceptable means of compliance as operators successfully implement FRMS under Action 25-9.

Action 5-3 CASA FRMS manager

CASA will appoint an FRMS manager to centrally oversight FRMS review, approval and monitoring.

Action 5-4 FRMS fee waiver

CASA will waive assessment fees for operators transitioning to FRMS to maintain existing operations as part of their transition to CAO 48.1.

Action 5-5 FRMS to SMS integration guidance

CASA will amend guidance material to encourage operators to have an appropriately scaled SMS prior to applying for an FRMS. This message will also be incorporated into communications regarding FRMS.

Action 5-6 FRMS implementation lessons

CASA will consider lessons from other regulators in developing regulations, guidance and implementation plans.

Note: The industry Technical Working Group identified examples of successful implementation for CASA to consider including:

- engagement by the Office of Transport Security with industry associations during the implementation of regional transport security plans
- the principles in the heavy vehicle risk classification system for developing guidance and acceptable means of compliance for FRMS
- EASA and UK CAA regulations and guidance material for FRMS.

Action 5-7 FRMS manager guidance

CASA will update guidance material to clarify that an accountable FRMS manager does not necessarily require a dedicated additional staff.

Note: The updated guidance material will identify that the nature of the FRMS manager position depends on the scale of the organisation and complexity of the FRMS. The conduct of activities such as data collection and analysis can potentially be outsourced but an employee of the organisation would still be accountable for the operation of the FRMS.

Action 5-8 FRMS application and assessment forms

CASA will review and improve the FRMS application and assessment forms.

Note: This action is particularly relevant to minimise unnecessary effort where an operator is using CASA sample documentation and acceptable means of compliance.

Action 5-9 FRMS application across commercial groups

CASA will amend guidance to clarify how an FRMS can be managed across a commercial group of operators.

Note: The guidance will clarify that an FRMS or its elements could be applied across a commercial group of operators with each AOC managing their own elements appropriate to the scale of operations. Each AOC would remain accountable for their FRMS and would receive individual CASA approvals.

Action 5-10 FRMS use of industry associations

CASA will conduct a dedicated campaign in conjunction with industry associations to communicate the availability of a scaled FRMS solution.

Note: This action is intended to leverage the excellent relationship between industry associations and their operators in order to dispel the impression that FRMS is only for high capacity RPT operators.

Action 5-11 FRMS pre-application meetings

CASA will amend guidance material to encourage operators to conduct a pre-application meeting before detailed planning to develop an FRMS.

Note: The pre-application meeting helps to generate a shared understanding of the requirements for FRMS and the process to be undertaken.

Some feedback recommended that CASA mandate the use of pilot association nominated representatives on Fatigue Safety Advisory Groups. CASA considers that appropriate pilot representation is important to an effective FRMS; however, CASA does not support a prescriptive approach to how this representation is achieved. An operator's FRMS manual will be required to describe membership of Fatigue Safety Advisory Groups (or equivalent).

The Technical Working Group achieved general consensus that endorsed CASA's proposed approach to membership of Fatigue Safety Advisory Groups. There were dissenting views that pilot association representation should be mandated.

Action 5-12 Fatigue Safety Advisory Group membership

CASA will retain an outcome-based philosophy in rules relating to pilot representation on Fatigue Safety Advisory Groups.

The Technical Working Group achieved general consensus that endorsed CASA's proposed approach to guidance for ultra-long range flights. There were dissenting views that crew rest facilities, crew complement and in-flight rest management should have prescriptive requirements for these flights.

CASA considers that this approach would be contrary to the outcome-based approach inherent within an FRMS and would potentially constrain solutions as regulations would need to keep pace with technological changes.

Action 5-13 Guidance for ultra-long range

CASA will amend guidance material to provide additional considerations to mitigate risks associated with increasing flight duty periods beyond the prescriptive limits.

Note: Considerations to be added to guidance material include: crew rest facilities, crew complement and in-flight rest management.

Recommendation 6 - Distinguish legal requirements and guidance

That CASA modifies the tone and language used in CAO 48.1 and all supporting documentation to clearly distinguish between legal requirements and guidelines on acceptable means of compliance.

Consultation feedback

A majority of respondents supported this recommendation although one respondent observed that while the CAO 48.1 Instrument rightly contains 'legal' language, the tone of the guidance material was clearly different from the 'legal' language.

The Technical Working Group recommended that CASA should not use internal manuals and handbooks to impose requirements that are not specified in the regulations. The group advised CASA should make it clear that guidance material and acceptable means of compliance represent one way of achieving compliance but that alternative means that meet requirements would also be considered.

CASA response

CASA will publish guidance to industry and inspectors to clarify the meaning of 'may include but not limited to' in contrast to 'must include but not limited to'.

CASA intends to improve the distinction between legal requirements, guidance material and acceptable means of compliance in CAO 48.1 and supporting guidance material. CASA will use equivalent material from the UK CAA and EASA as examples and seek industry feedback on materials to ensure that this recommendation has been achieved.

Action 6-1 Tone and language

CASA will improve the distinction between legal requirements, guidance material and acceptable means of compliance in CAO 48.1 and supporting guidance material.

Recommendation 7 - Limit switching between appendices

That CASA considers limiting an operator's ability to switch between appendices during a single FDP. Where multiple types of operations that would fall under different appendices are required to be undertaken during a single FDP, the more restrictive limits should apply.

Consultation feedback

The recommendation was generally supported although respondents expressed concern that this might unnecessarily limit an operator's ability to conduct safe operations. A suggestion was to limit the FDP to the activity type that comprises the majority of the FDP while others

suggested that the most restrictive limit should apply. One respondent suggested that a specific set of limits be applied when transitioning from aerial application into other commercial operations.

The Technical Working Group achieved general consensus that operations under multiple appendices should be permitted within a single FDP and that the most restrictive limit should be applied. Where this could not be achieved then operations should be conducted under an FRMS.

A dissenting view was that the limit applicable to the activity underway at the time should apply. CASA agrees with this view as this approach applies the relevant fatigue risk profile to the activity underway at the time. This is consistent with how some software developers have implemented the fatigue rules.

There was a further dissenting view that it was not acceptable to allow a greater likelihood of fatigue in aerial work operations in comparison to passenger carrying operations. The complexity, workload and environmental conditions associated with aerial work operations potentially increase the fatigue risk. The dissenting view noted that accident rates reflect the additional risk in this sector. CASA acknowledges this view; however, CASA is regulating aviation safety to accept lower risks to passenger transport where participants are not reasonably aware of the risk, nor have control over the risk. CASA accepts higher risk for aerial work operations as the crew are informed participants and can reject or cease the tasking if they assess the fatigue risk to be unacceptable. However, CASA acknowledges that commercial pressures and pilot capability to self-assess fatigue support a requirement to have prescriptive limits in place.

Additional Technical Working Group feedback in relation to transitioning between appendices on subsequent duty periods is addressed by actions 25-7.

CASA response

CASA proposes to continue to allow switching between appendices where necessary. The activity type that is underway at a given time would dictate the relevant flight duty period as per the current paragraph 13.1 of CAO 48.1. The subsequent off duty period would be the highest applicable off duty period as per paragraph 13.4 of CAO 48.1.

Action 7-1 Switching appendices in a single FDP (rule)

CASA will amend CAO 48.1 to clarify that switching between appendices is permitted where necessary with the activity type dictating the relevant flight duty period. The subsequent off duty period will be the highest applicable off duty period.

Action 7-2 Switching appendices in a single FDP (guidance)

CASA will provide improved guidance on how to handle operations in multiple appendices within a single FDP and transitioning from one appendix to another appendix during an off-duty period.

Recommendation 8 - Aerial application limits

That CASA considers removing Part 137 aerial application operations from CAO 48.1 due to the sector's lower relative risk exposures. If it is deemed necessary to include restrictions for aerial application operators in CAO 48.1 then CASA should consider increasing the flexibility of the relevant CAO 48.1 limits to align them with the current provisions of Subpart 137.Q.

Consultation feedback

This recommendation was strongly supported by the aerial application industry with suggestions to further amend Part 137.Q. Suggested changes include adding rotary within Part 137 and allowing the reset of monthly and annual limits by extended rest periods. Some respondents expressed concern that removing limits for aerial application would expose pilots to greater risk within a sector with a relatively high accident rate.

The industry Technical Working Group achieved general consensus endorsing the removal of aerial application operations from CAO 48.1 and retaining the limits in CASR Sub-part 137.Q. The Technical Working Group discussed feedback from the aerial application sector highlighting that environmental factors such as wind speed, dew point and temperature act as additional mitigators that limit flying. These mitigators can't be easily quantified into discrete factors to be incorporated in prescriptive limits. The Technical Working Group noted that the financial incentives for aerial applications pilots to accept additional work are in tension with fatigue risk management and that this supports retaining some form of prescriptive limits until more data is available. The Technical Working Group noted that the Aerial Application Association of Australia is proactively promoting safety initiatives to reduce accident rates.

There was a dissenting view that it was not acceptable to allow a greater likelihood of fatigue in aerial application operations in comparison to passenger carrying operations. The complexity, workload and environmental conditions associated with aerial application operations potentially increase the fatigue risk. The dissenting view noted that accident rates reflect the additional risk in this sector.

CASA response

CASA acknowledges the dissenting view; however, CASA regulates aviation safety to accept lower risks to passenger transport where participants are not reasonably aware of the risk, nor have control over the risk. CASA accepts higher risk for aerial work operations as the crew are informed participants and can reject or cease the tasking if they assess the fatigue risk to be unacceptable. However, CASA acknowledges that commercial pressures and pilot capability to self-assess fatigue support a requirement to have prescriptive limits in place.

Action 8-1 Aerial application limits

CASA intends to incorporate the intent of [CASA EX92/16 – Exemption CAO 48.1 Instrument 2013 – aerial application operations \(in aeroplanes\)](#) into an amended CAO 48.1.

Note: CASA intends to monitor data from fatigue surveys and operator reporting under action 25-8.

Recommendation 9 - Allowance for individual circumstances

That CASA removes the requirement for operators to make allowance for individual circumstances when assigning work, given the existing requirement for flight crew members to commence flight duty periods fit for duty, and notify the company if they consider themselves unfit for duty at any time.

Consultation feedback

Feedback regarding this recommendation was mixed. Some argued that requiring operators to take individual circumstances into account was unreasonable, others argued that individual circumstances and variation are significant in fatigue risk. Many respondents highlighted the importance of the dual responsibility for both operators and crew members. Some respondents argued that the requirement and ability of a crew member to declare themselves unfit for duty was sufficient and removed the requirement for operators to actively manage individual circumstances.

The industry Technical Working Group recommended that CASA use the dual responsibility provisions in the consultation draft of Part 91 of CASR to address similar responsibilities in the fatigue rules.

Some Technical Working Group members suggested that the use of sick leave to manage fatigue and the remuneration impact of rejecting tasking due to fatigue are safety concerns that should be addressed through regulation. The general consensus was that these issues are important but are best addressed through industrial agreements.

CASA does not intend to regulate these matters at this time. CASA may include consideration of these matters in guidance material.

The Technical Working Group recommended that the 'adverse matters' listed in the current CAO be moved to guidance material, and that CASA provide additional guidance regarding the need to report to work fit for duty and available/standby days regardless of home address and other circumstances.

The guidance material will reflect a continued shared responsibility to manage reasonably foreseeable hazards.

CASA response

CASA will update the rules to reflect the dual responsibility provisions in the consultation draft of Part 91 of CASR.

CASA does not intend to amend regulations in relation to the use of sick leave or remuneration impact of rejected tasking at this time but may include consideration of these matters in guidance material.

CASA will move the 'adverse matters' listed in the current CAO to guidance material and provide additional guidance to reflect a continued shared responsibility to manage reasonably foreseeable hazards.

Action 9-1 Shared responsibility (rules)

CASA will update the CAO to reflect the dual responsibility provisions in the consultation draft of CASR Part 91.

Action 9-2 Shared responsibility (guidance)

CASA will update guidance material to reflect the dual responsibility provisions and identify considerations for operators and flight crew.

Recommendation 10 - Integrate fatigue and NTS training

That CASA amends CAAP SMS-3(1) to link the content of NTS fatigue management training to the content required for operators under CAO 48.1. This would streamline and align fatigue management and NTS training program outcomes.

Consultation feedback

A majority of respondents supported this recommendation.

CASA response

Action 10-1 Training alignment

CASA will integrate the fatigue training requirements for tier 2 appendices with non-technical skills training.

Recommendation 11 - Publishing rosters

That CASA amends CAAP 48-1 to reflect a more realistic publishing requirement for flight crew rosters. This could be achieved by reducing the guidance to a more realistic period, such as 7-10 days, noting that any other requirements included in current industrial agreements would still apply.

Consultation feedback

Feedback regarding this recommendation was mixed. Some respondents identified this 'requirement' as guidance material and did not agree with the recommendation, and others pointed out that pilots should be advised of their rosters well in advance. Other respondents suggested that a 7 day period was sufficient to provide appropriate fatigue management.

The Technical Working Group recommended wording "for scheduled operations operators should publish a planned roster at least 7 days prior to commencement of roster period" and recommended removal of the specific cases in the current guidance. The Technical Working

Group noted that the time period for publication of a planned roster may be increased by an industrial agreement.

CASA response

Action 11-1 Roster publication

CASA will update guidance documents to reflect "for scheduled operations operators should publish a planned roster at least 7 days prior to commencement of roster period" and remove the specific cases identified in the current guidance.

Recommendation 12 - Flight duty period re-assignment

That CASA amends the Appendix 2, four-hour FDP extension limit to one which better reflects international standards for similar operations. An extension to FDP in accordance with sector numbers and time of day limitations, similar to the EASA limits, would be a more appropriate method of balancing operational flexibility with fatigue mitigation.

Consultation feedback

Responses to this recommendation were mixed. Some respondents stated that the limitation on extensions unnecessarily restricts operations, others stated that the limitation ensures that pilots are appropriately rested for duty.

Some responses related to provisions regarding extensions in unforeseen circumstances (clause 3 of Appendix 2) rather than the 4 hour limit on re-assignment and extension (clause 7 of Appendix 2).

The Technical Working Group agreed that explicit acknowledgement that flight crew are sufficiently rested prior to re-assigning longer duty periods was preferable to the prescriptive limit in the current rules.

CASA response

Action 12-1 FDP re-assignment (rules)

CASA will replace the 4 hour limit in subclause 7.1 of Appendix 2 with a requirement for explicit acknowledgement that flight crew are sufficiently rested before re-assigning a longer flight duty period.

Action 12-2 FDP re-assignment (guidance)

CASA will develop simple guidance for flight crew to consider prior to acknowledging that they are sufficiently rested. This will include factors such as projected time awake at end of duty.

Recommendation 13 - Dealing with consultation feedback

That CASA implements a rigorous, 'error tolerant' process for formally logging, recording and responding to industry submissions in a systematic and transparent way.

Consultation feedback

A majority of respondents supported this recommendation.

The industry Technical Working Group endorsed CASA's actions to date and agreed that this action and recommendation can be closed.

CASA response

CASA has implemented an online Consultation Hub as a tool to conduct industry consultation. This provides an automatic method to capture industry feedback and, to increase transparency, publish responses where permission is provided. The consultation for this review is an example of how CASA is conducting consultations. Where CASA receives feedback outside the Consultation Hub that feedback is formally logged and assessed.

Following analysis of consultation feedback, CASA publishes a Summary of Consultation to close the feedback loop.

CASA has updated internal governance manuals to ensure that these processes are used for all major regulatory changes.

Action 13-1 Consultation improvements - CLOSED

CASA has implemented an online Consultation Hub to conduct industry consultation.

Recommendation 14 - Road testing changes

That for future complex, industry-wide regulatory change, CASA considers 'road-testing' the proposed changes in a collaborative 'desk-top' exercise with a representative sample of operators, to identify critical stumbling blocks, before formal implementation of the legislation and industry-wide roll-out.

Consultation feedback

A majority of respondents supported this recommendation.

The industry Technical Working Group endorsed CASA's proposed approach and emphasised the need to include the group in the detailed review of a draft order, when available, and subsequent post implementation review.

CASA response

CASA has taken steps to ensure the aviation community is directly involved in the early setting of safety objectives and policy through to road-testing proposed changes before they are implemented. CASA has established the Aviation Safety Advisory Panel as the primary advisory body through which CASA directs its engagement with industry during the development and implementation of regulatory changes.

The Aviation Safety Advisory Panel has established a Technical Working Group to provide advice regarding the recommendations of the fatigue review. CASA intends to utilise this working group to assist with 'road-testing' regulatory amendments, guidance material and forms associated with the fatigue review. This action and recommendation will be reviewed for closure once the amendments, guidance material and forms have been released.

Action 14-1 Industry road testing

CASA will use the industry Technical Working Group to assist in road-testing amendments to CAO 48.1 and related guidance material and forms.

Recommendation 15 - CASA staff training

That as part of the regulatory package development process, CASA develops in-house training, guidelines and communication protocols to ensure that CASA staff supporting the implementation of new regulations are all 'on the same page' when advising industry.

Consultation feedback

A majority of respondents supported this recommendation.

CASA response

Action 15-1 CASA training

CASA will appoint an FRMS manager under Action 5-3 and a centralised FRMS oversight team under Action 16-1. CASA will provide training to inspectors relevant to their role in each phase of the regulatory change process.

Recommendation 16 - CASA FRMS point of contact

That CASA establishes a single point of contact for industry seeking advice on FRMS, to ensure that accurate, timely, complete and consistent information is provided. To accomplish this, CASA should consider the creation of a centralised (perhaps 'virtual') cell of fatigue management and FRMS expertise to ensure standardisation of the evaluation of applications for FRMS and the subsequent calibration and standardisation of FRMS oversight.

Consultation feedback

This recommendation was very strongly supported by respondents reflecting a concern that CASA staff assessing FRMS were insufficiently trained leading to inconsistent advice and decision making.

The industry Technical Working Group endorsed CASA's proposed approach and recommended that industry be invited to participate in training and development activities. This is addressed by action 25-10.

CASA response

CASA has established a core group of inspectors who will be involved in the detailed development of updated fatigue rules and guidance material. These inspectors will provide local subject matter expertise within each CASA region.

CASA will establish an internal fatigue risk management panel of inspectors who have additional training and experience in fatigue risk management. Members of this panel will be responsible for assessing and peer reviewing applications for FRMS approvals. This will help ensure a nationally consistent application of these approvals.

Action 16-1 FRMS oversight team

CASA will establish an internal fatigue risk management panel of inspectors to assess and peer review applications for FRMS approvals.

Recommendation 17 - Standard templates and file naming

That CASA implements a process which utilises standard templates to produce documents that are clearly identifiable, and presented in a consistent, 'user-friendly' format. Such documents would then be more easily stored and managed, creating a logical trail for future reference.

Consultation feedback

This recommendation was generally supported by respondents.

CASA response

CASA has updated document templates for guidance material and will trial an improved file naming convention as documents are produced or updated as part of this review. If the trial is successful CASA will adopt the same conventions across all updated regulatory material. This recommendation will be reviewed for closure once revised guidance material is published under other actions.

Action 17-1 Templates and file naming

CASA will use consistent document templates and file naming conventions for guidance material produced to support the fatigue rules.

Recommendation 18 - Current version of CAO 48.1 and related documents

That CASA provides clearer guidance (on the website and elsewhere as necessary) on the current status of, and relationship between, all CAO 48.1 documentation.

Consultation feedback

A majority of respondents supported this recommendation.

The Industry Technical Working Group endorsed CASA's proposed approach and recommended that CASA incorporate explanatory statements into other communications regarding regulatory change.

CASA response

CASA will update the website to better explain which rules and guidance apply and seek industry feedback on changes to ensure that they achieve the desired effect.

CASA will assign responsibility for ongoing maintenance of the fatigue pages to a single owner. These pages will include links to best practice information and guidance from other regulators.

CASA will introduce the legislative changes from this review into a single legislative instrument that provides clarity regarding which rules apply.

CASA has started incorporating explanatory statements into communications regarding regulatory change.

Action 18-1 Current status of CAO 48.1

CASA will update the website to better explain which rules and guidance apply. The legislative changes from this review will be incorporated into a single instrument.

Recommendation 19 - CASA resources

That CASA allocates appropriate resources to the planning of a detailed, coordinated CAO 48.1 implementation strategy, as a matter of priority.

Consultation feedback

A majority of respondents supported this recommendation. The Technical Working Group endorsed CASA's proposed approach and recommended that CASA should consider dedicating resources to the development and implementation of the fatigue rules.

CASA response

CASA will establish an FRMS manager under Action 5-3 and a centralised FRMS oversight team under Action 16-1. CASA is also hiring an additional fatigue specialist under Action 22-1. CASA intends to develop a detailed project management plan to achieve the actions identified in this response including resourcing.

Action 19-1 Fatigue implementation resourcing

CASA will develop a detailed project management plan to achieve the actions identified in this response including resourcing.

Recommendation 20 - Freeze transition dates

That CASA freezes CAO 48.1 transition dates for all elements of the aviation industry until recommended changes resulting from the current Review can be made to stabilise a final version of CAO 48.1 and all associated supporting documentation for implementation.

Consultation feedback

This recommendation was generally supported. Some operators suggested that where an operator was close or ready to commence an FRMS trial, this should not be delayed.

The industry Technical Working Group endorsed a need to extend the transition period whilst continuing to assess operators that intend to transition to the new rules. The Technical Working Group highlighted that some operators who would require an FRMS under CAO 48.1 Instrument 2013 may not require an FRMS under the intended rules and noted that CASA proposes no obligation for these operators to transition until the modified prescriptive limits are in place.

The Technical Working Group acknowledged that operators who choose to implement an FRMS prior to completion of all recommendations may receive minor inconsistencies with CASA's approach as planned training may not have occurred.

CASA response

CASA will amend CAO 48.1 in its current form to modify the compliance deadline with an initial focus on operators carrying larger numbers of passengers and regularly operating outside the proposed prescriptive limits.

CASA will modify the deadline to 30 September 2019 for high capacity regular public transport operators under CAO 82.5. This provides time for CASA to amend CAO 48.1 and operators to finalise their FRMS applications. Regulatory change and guidance material to support these operators will be prioritised to achieve this deadline.

CASA will modify the deadline to 26 March 2020 for all other operators. This would provide time for CASA to develop more comprehensive guidance material and sample documents suitable for smaller operators and allow operators to update their manuals accordingly. This timing takes into consideration the impact of transition to flight training regulations under CASR Parts 141 and 142 and flight operations regulations under CASR Parts 91, 119, 121, 133 and 135.

CASA will continue reviewing and approving applications under CAO 48.1 instrument 2013 and 2016, including FRMS, and will develop transitional arrangements to continue recognition of these approvals.

Action 20-1 Transition dates

CASA will modify the transition deadline to 30 September 2019 for high capacity regular public transport operators and 26 March 2020 for all other operators.

Recommendation 21 - Staggered approach to transition

That CASA adopts a staggered approach to the implementation of and transition to CAO 48.1, with initial transition proceeding first for elements of the industry with the highest risk exposure.

Consultation feedback

A majority of respondents supported this recommendation.

The Technical Working Group supported this recommendation and emphasised that operators with FRMS applications submitted or close to submission should not be disadvantaged by delaying until regulatory changes are made.

CASA response

Action 21-1 Staggered implementation

CASA will continue assessing FRMS applications and prioritise transition of high capacity regular public transport operators under Action 20-1.

Recommendation 22 - CASA FRMS capability

That CASA initiates action to acquire and / or develop a significantly increased capability for FRMS evaluation and oversight. This action should be linked with the development of clear system / documentation outcomes, including timelines, and determining the particular skills required.

Consultation feedback

This recommendation was very strongly supported by respondents, reflecting a concern that CASA staff assessing FRMS were insufficiently trained leading to inconsistent advice and decision making.

The Technical Working Group emphasised the importance of consistency in evaluation, approval and particularly rejection of FRMS.

CASA response

In addition to Actions 5-3 and 16-1 CASA intends to hire an additional fatigue specialist to assist with development, implementation and monitoring of FRMS.

Action 22-1 FRMS capability

CASA will hire an additional fatigue specialist to assist with development, implementation and monitoring of FRMS.

Note: This recommendation will be reviewed for closure once Actions 5-3 and 16-1 are closed.

Recommendation 23 - FRMS autonomy

That CASA reviews the content and language used in CAO 48.1, Appendix 7, Section 7 to ensure that it allows operators sufficient autonomy to be able to manage and improve their FRMS efficiently.

Consultation feedback

Responses to this recommendation were polarised. Some respondents supported increased autonomy for operators in managing their FRMS with minimal CASA intervention. In contrast, other respondents expressed concerns that too much autonomy would allow commercial interests to outweigh safety with insufficient power for the regulator to intervene.

CASA response

CASA proposes that this recommendation will be achieved with Action 5-1.

Action 23-1 FRMS language

Review this recommendation for closure once Action 5-1 is closed.

Recommendation 24 - FRMS assessment process guidance

That CASA provides clear and comprehensive information to operators and flight operations inspectors on the FRMS assessment process, including differences between requirements and guidelines at different levels of operational scale.

Consultation feedback

This recommendation was strongly supported by respondents.

CASA response

CASA proposes that this recommendation will be achieved with Actions 5-1, 5-2, 5-6, 5-7 and 5-8.

Action 24-1 FRMS guidance

CASA will review this recommendation for closure once Actions 5-1, 5-2, 5-6, 5-7 and 5-8 are closed.

Additional issues raised during consultation

Industry feedback and Technical Working Group discussion raised several issues that were not directly related to the closure of recommendations.

CASA will commission regular third party surveys of industry to establish a fatigue baseline, assess the impact of fatigue rules and identify further continuous improvement opportunities. The survey approach will seek to capture multiple parts of the aviation industry to inform future regulation development including flight crew, cabin crew, maintenance personnel and air traffic controllers.

Action 25-1 Fatigue surveys

CASA will commission regular third party surveys of industry to establish a fatigue baseline, assess the impact of fatigue rules and identify further continuous improvement opportunities.

The Technical Working Group recommended that CASA clarify that as organisations mature there may be an increase in the number of fatigue reports due to improved reporting culture. The guidance should emphasise that operators should analyse fatigue reports looking for trends and indications of tasking behaviour that generates higher fatigue risk and requires additional mitigation.

Action 25-2 Guidance – Fatigue reporting

CASA will develop guidance regarding the relationship between fatigue reports and reporting culture.

Action 25-3 Holistic view of fatigue mitigations

CASA will develop guidance material that provides a clear picture of how the different fatigue mitigations within CAO 48.1 interact to provide holistic mitigation of fatigue risks in accordance with fatigue management principles.

Action 25-4 Monitor fatigue data and international trends

CASA will monitor data from fatigue surveys and fatigue reporting in conjunction with changes in international rules to inform future changes to prescriptive limits.

Action 25-5 Review augmented crew limits

CASA will review augmented crew flight duty limits and seek Technical Working Group feedback. Following feedback, amendments to the augmented crew limits may be proposed.

Action 25-6 Review consecutive early starts

CASA will develop additional mitigations to deal with consecutive early starts using the approach in CAO 48.0 as a starting point and seek Technical Working Group feedback. Following feedback, amendments to the rules may be proposed.

The Technical Working Group identified that the requirements for days off duty when transitioning from Appendix 4B, 5 or 5A at paragraph 12A of CAO 48.1 were overly complex and difficult to comply with. CASA will review the requirements and propose an alternative approach to permit transition between appendices on subsequent FDPs. CASA will seek Technical Working Group feedback on the proposal. The proposed strategy for transitioning from aerial application operations into charter will be reviewed as part of this approach.

Action 25-7 Review off duty requirements when transitioning between appendices

CASA will review the requirements for days off duty at paragraph 12A of CAO 48.1, propose an alternative approach and seek Technical Working Group feedback.

Action 25-8 Consider removal of limits for aerial application

CASA will monitor data from fatigue surveys and fatigue reporting to assess whether further changes to Part 137.Q can be supported, or if CASA should remove prescriptive flight duty periods from this sector.

Action 25-9 Publish additional FRMS Acceptable Means of Compliance

As operators successfully implement FRMS, CASA will publish additional acceptable means of compliance to assist other operators.

Action 25-10 Industry FRMS training opportunities

CASA will invite industry to participate in FRMS training and development opportunities.

Action 25-11 Window of circadian low definition

CASA will consider whether there is benefit in explicitly defining a window of circadian low and seek Technical Working Group feedback.

Some Technical Working Group members suggested a definition of 0200-0600; however, there was no consensus on the need for a definition, the associated time period or the additional mitigations that should be associated with the definition.

Action 25-12 Transition fatigue rules to CASR

CASA will transition the fatigue rules from CAO to CASR after completion of transition to both the fatigue rules and the flight operations rules.

Action 25-13 Standby

CASA will review the management of standby under CAO 48.1 and seek Technical Working Group feedback on any proposed changes to the rules.

Action 25-14 Off duty periods

CASA will seek feedback from Technical Working Group members regarding difficulty managing off-duty periods. Any proposed changes will be subject to further consultation.