

Assessment of Flight and Duty Time Schemes Procedure

Purpose

Fatigue is a major human factors hazard because it affects a crew member's ability to perform their tasks safely. Operator fatigue management schemes are therefore critically important in ensuring that crew members are sufficiently alert to adequately perform safety-related operational duties.

This procedure presents the CAA's position on fatigue management and assessment methodology in the current regulatory framework. It is considered an interim procedure, until the Fatigue Risk Management Project is concluded and the outcomes of that project are decided. It lays out the expectations of the CAA and the process it currently uses to assess schemes for the regulation of flight and duty times that fall outside the requirements of Advisory Circular AC119-2.

1. Air operators are required to establish FDT schemes
2. The Director must assess and accept these
3. AC119-2 provides guidance on schemes that are acceptable to the Director
4. The procedure outlines CAA's assessment process, and the elements it will consider if operators submit schemes outside the requirements of AC119-2

Scope

This procedure applies to all air operators certificated under Civil Aviation Rules Parts 119/121, 119/125 or 119/135, and adventure aviation operators certificated under Part 115. In the context of this policy these participants will all be referred to as "operators".

These operators are required to establish schemes for the regulation of flight and duty times of flight crew members as per Rules 121.803, 125.803, 135.803 and 115.401.

Although these Rules pertain to flight crew members, the CAA *recommends* that operator fatigue management schemes include provision for flight attendants, consistent with international standards¹.

The procedure is applied by the flight operations inspectors of the Air Transport & Airworthiness, the General Aviation, and the Aviation Infrastructure & Personnel groups of the CAA.

¹ Refer ICAO *Annex 6 Part I International Commercial Air Transport – Aeroplanes* and ICAO IATA IFALPA *Fatigue Management Guide for Airline Operators*.

The Hong Kong *CAD 371 The Avoidance of Fatigue in Aircrews* is a good starting point.

Policy

Managing fatigue

Operators must establish schemes for the regulation of flight and duty times (FDT schemes) of flight crew members as a means to manage fatigue-related risk. These are assessed by the CAA and must be acceptable to the Director.

FDT schemes require the definition of limits on flight, duty, and rest times. These must be set after consideration of certain factors impacting fatigue (for example type of operation, circadian rhythm, etc.). There are 21 factors in Rules 121.803, 125.803 and 135.803, and 11 in 115.401.

Acceptable schemes

CAA Advisory Circular *AC119-2 Air operations – Fatigue of Flight Crew* provides guidance and different sets of limits that, when applied and followed in full, will be, in principle, deemed an acceptable scheme where they fit operators' operations.

Alternative schemes

The options in AC119-2 are not the only FDT schemes the Director can find acceptable. They were established to provide an acceptable level of safety in certain, generic operating circumstances. The Rules provide operators with the flexibility to develop schemes that fit their specific operations.

Although the Rules do not specify that FDT schemes must be supported by a risk management process, the CAA considers that risk management is an essential part of any management system or safety-related process. This is supported by section 12 of the Civil Aviation Act 1990 and is consistent with SMS principles. This is also consistent with operator responsibilities for managing risks under the Health and Safety at Work Act 2015 (HSWA).

Operators are best placed to understand the hazards and risks in their operations and thus establish flight crew rostering and scheduling systems that minimise fatigue-related risk given their operating context, and flight and pilot profiles. At the same time, it is difficult for operators to have the in-house expertise to draft a scheme that would give them reasonable confidence that the rostering and scheduling system would suitably mitigate fatigue risk and achieve the same or a greater level of safety as the published prescriptive limits.

The CAA therefore expects operators to seek validation of their proposed schemes by a qualified and recognised fatigue management expert² prior to presenting it to the CAA. This would provide confidence that expert scientific advice was applied to the scheme(s).

² A recognised fatigue management expert would satisfy the following criteria:

- They are regularly published and cited in peer-reviewed scientific publications
- They regularly contribute to fatigue management events
- They are regularly sought by transport operators to develop and review fatigue management schemes
- They are established in accredited universities and have recognised research facilities

The Sleep/Wake Research Centre at Massey University, the Occupational and Aviation Medicine Unit at the University of Otago, and the Human Factors & Safety University Research Centre of CQUniversity in Australia are recognised for their expertise in fatigue and fatigue management schemes in transport. They are not the only options, but if an operator chooses another institution we suggest they seek the CAA's advice to determine if they are acceptable before committing and spending resources to develop or assess a scheme.

Roles and responsibilities

The Deputy Director Air Transport & Airworthiness (GMATA) is responsible for this procedure, ensuring it is regularly reviewed and maintained in accordance with CAA document control policies and procedures.

Flight Operations Inspectors are responsible for applying this policy, assessing FDT schemes and, within the scope of their delegations, approving them. They are to seek technical advice from recognised fatigue management specialists when assessing schemes that fall outside the strict requirements of AC119-2.

Operators are responsible for establishing and maintaining FDT schemes, submitting schemes for CAA acceptance, and demonstrating that the schemes meet the requirements of AC119-2 or that they provide the same or a greater level of safety if the parameters are outside AC119-2.

Operators are also responsible for monitoring the effectiveness of their schemes in achieving desired safety performance, consistent with SMS or quality assurance principles, as applicable.

Process

This section outlines how the CAA will process applications and assess FDT schemes.

Application

1. Initial entry into the civil aviation system

The FDT scheme is a mandatory programme that operators must have before they can be certificated and enter the New Zealand civil aviation system. It must be documented in the operator's exposition required by 119.81 or 119.125, or 115.79.

It is the operator's responsibility to demonstrate to the CAA that they meet all the regulatory requirements and can operate safely. For FDT schemes, this means the application should make it clear whether the proposed scheme follows AC119-2 or not. Good and clear demonstration through well documented policies, systems and procedures will facilitate the CAA's assessment.

2. Amendment

Operators may wish to make changes to their FDT schemes to reflect changes in their operations or to make potential efficiency gains for instance. They are required to seek prior acceptance of the changes by the Director as per 119.165(b)(9) or 115.109(b)(8). Such changes must follow this same process.

Assessment

1. Meeting AC119-2 requirements

Where an operator has indicated that their FDT scheme meets the requirements of AC119-2, it is likely the CAA's assessment will be straightforward, provided it is convinced through the exposition that all the requirements are met and the scheme is appropriate, taking into account the size of the organisation, the nature of its operations and the complexity of the activities undertaken.

2. Alternative schemes outside AC119-2

Where an operator has indicated that their FDT scheme is outside the requirements of AC119-2, the application must be supported by a report from a recognised fatigue management specialist that endorses the scheme. This endorsement will signify that the scheme

- is consistent with scientific principles regarding the management of fatigue;
- has taken into account operational experience from the operator; and
- meets the criteria of Rules 121.803, 125.803, 135.803, or 115.401 as relevant.

Alternative FDT schemes may present greater risk given that they must demonstrate an equivalent or greater level of safety than prescribed schemes. The presence and effectiveness of the following processes and systems will provide greater confidence to the CAA that an operator's application meets the required standards:

- Procedures and tools for creating flight assignments and assigning crew members (roster, schedule) which incorporate the FDT scheme and related risk management;
- Operator policies which outline crew responsibilities for managing fatigue and reporting fatigue related hazards and occurrences;
- Internal fatigue reporting system (this is part of hazard identification);
- Monitoring system that is both reactive (analysing the data from the reporting system) and proactive (for example interviewing staff on various rosters without waiting for fatigue reports in an effort to gain insight into as yet undisclosed fatigue related issues).
This fits into the system of safety management or internal quality assurance currently required by the Rules;
- Competence of personnel who may be affected by or have an impact on fatigue, including crew rosterers and schedulers. This should include training on the causes and consequences of fatigue, mitigation strategies, as well as company policies and procedures.
This fits into the training requirements under the system of safety management, as well as the human factors requirements of an operator's training programme;
- Engagement with and participation of staff.
Operators should consider their obligations under the HSWA by giving workers reasonable opportunity to contribute to the decision-making process; and
- Other relevant factors, taking into account the type of organisation, and the nature and complexity of its operations, etc.

In essence, the CAA will assess the operator's process of developing / validating an FDT scheme and will consider the supporting processes that provide assurance that risks are being managed. These assessments will be on a case-by-case basis and FDT schemes will be assessed on their individual merits.

Demonstration

The CAA's assessment process will not be limited to a desktop review. Certification also requires the operator to demonstrate – during an onsite visit – that they have the capability and competence to implement the proposed scheme effectively. This means that process, tools, training, etc. are in use and there is evidence the objectives of the FDT scheme are achieved.

Certification

The CAA will record the acceptance of an FDT scheme on the operator's Operations Specifications as per 119.15 or 115.13.

Future developments

This procedure presents the CAA's position on fatigue management and assessment methodology in the current regulatory framework. The CAA recognises that the effective management of fatigue risk is more than just prescribing flight, duty, and rest times and that there have been scientific and regulatory developments since the rules were established, including the option for formal fatigue risk management systems³.

This procedure will be updated in due course as the CAA completes its review of the current fatigue management regulatory framework.

Further information

Advisory Circular AC119-2 *Air operations – Fatigue of Flight Crew*
(<https://www.caa.govt.nz/rules/acs>)

Advisory Circular AC119-3 *Air Operator Certification – Part 135 Operations* provides general guidance on the development of FDT schemes (<https://www.caa.govt.nz/rules/acs>)

The CAA provides resources and links to other authorities that can help operators establish FDT schemes on the *Fatigue Risk Management* page of its website (<http://www.caa.govt.nz/medical/fatigue-risk-management>).

The acceptance of FDT schemes falls within the general activity of certification of aviation organisations. Refer to the CAA's *Certification Policy – Organisations* on the CAA's operational policies webpage (<http://www.caa.govt.nz/policy-ops/policy-ops>) for general information on CAA's regulatory approach.

³ Refer ICAO Annex 6 Part I – *International Commercial Air Transport – Aeroplanes*, Appendix 7.