

Advisory Circular

GUIDANCE ON FATIGUE RISK MANAGEMENT FOR ANR-121 OPERATIONS

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GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 3C of the Air Navigation Act (Cap. 6) (ANA), to demonstrate compliance with a statutory requirement. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

PURPOSE

This AC provides guidance to demonstrate compliance with, and information related to, requirements on fatigue risk management for operations in accordance with ANR-121.

APPLICABILITY

This AC is applicable for the AOC holder operating in accordance with ANR-121.

RELATED REGULATIONS

This Advisory Circular relates specifically to Division 11 in Part 2 and the Fifth Schedule of ANR-121.

RELATED ADVISORY CIRCULARS

AC 121-11-2 Fatigue Risk Management for Ultra Long Range Operations

CANCELLATION

This AC supercedes AC 121-11-1(Rev 0). In this Revision 1, guidance is inserted for the AOC holder regarding the implementation of “Day Off” in ANR-121 5th Schedule Part 1.

EFFECTIVE DATE

This AC is effective from 28 January 2025.

OTHER REFERENCES

Nil.

GUIDANCE 121 REG178 GUIDANCE FOR REGULATION 178 OF ANR-121 – FATIGUE RISK MANAGEMENT PROGRAMME

- 1 The limitations based upon the provisions in Division 11 and the Fifth Schedule of ANR-121 are to provide safeguards against both kinds of fatigue – transient and cumulative - because they recognise:
 - (a) the necessity to limit flight duty periods with the aim of preventing both kinds of fatigue;
 - (b) the necessity to limit the duty period where additional tasks are performed immediately prior to a flight or at intermediate points during a series of flights in such a way as to prevent transient fatigue;
 - (c) the necessity to limit total duty time and flight time over specified periods, in order to prevent cumulative fatigue;
 - (d) the necessity to provide crew members with adequate rest opportunity to recover from fatigue before commencement of the next flight duty period; and provision of extended rest periods (Days Off) to recover from cumulative fatigue;
 - (e) the necessity of taking into account other related tasks the crew member may be required to perform in order to guard particularly against cumulative fatigue.
- 2 The AOC holder should take the above considerations into account when developing its FRMS.
- 3 If the AOC holder intends to conduct ultra-long range operations, refer to AC 121-11-2.

GUIDANCE 121REG179 GUIDANCE FOR REGULATION 179 OF ANR-121 – RESPONSIBILITIES OF OPERATOR FOR FATIGUE MANAGEMENT

- 1 Preparation of Duty Roster
 - 1.1 As part of managing fatigue, Regulation 179(3)(a) requires the AOC holder to prepare and publish duty rosters sufficiently in advance to provide crew members the opportunity to plan adequate rest. In preparing duty rosters, consideration should be given to the cumulative effects of undertaking long duty hours interspersed with minimum rest, and of avoiding rosters that result in the serious disruption of an established pattern of working and sleeping. Rosters should cover a period of at least 4 weeks.
- 2 Training for crew members on fatigue management
 - 2.1 Regulation 179(3)(d) requires the AOC holder to train, or educate, the flight crew members, cabin crew members and relevant operational personnel (such as the rostering staff looking after crew scheduling and activation) on fatigue management. The training should cover the effects of sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member's alertness and ability to safely operate an aircraft or perform safety-related duties. The training should also include all relevant factors such as:
 - (a) the number and direction of time zones crossed;
 - (b) the time at which a flight duty period is scheduled to begin;
 - (c) the number of planned and/or actual sectors within the flight duty period;

- (d) the pattern of working and sleeping relative to the circadian rhythm, or 24-hour physiological cycle of the crew;
- (e) the scheduling of days off;
- (f) the sequence of early reporting times and late releases from duty;
- (g) mixing early/late/night duties; and
- (h) flight operation characteristics.

3 Accommodation for rest

3.1 Regulation 179(3)(e) requires the AOC holder to provide suitable accommodation for the crew member to rest when the crew member is away from home base.

3.2 While the travelling time spent by a crew member in transit between the place of rest and the place of reporting for duty is not counted as duty, it is a factor contributing to fatigue. Excessive travelling time undertaken immediately before commencing a flight duty period could therefore detract from a crew member's ability to counter fatigue arising whilst on duty, and should therefore be taken into account when deciding where pre-flight rest should be taken. The accommodation provided by the AOC holder at crew layover stations should therefore be planned such that it would not normally require excessive travelling time to reach the place of reporting.

3.3 The AOC holder should also provide advice to a crew member, whose usual travelling time from the crew member's home to the normal departure aerodrome is in excess of 1 ½ hours, to consider making arrangements nearer the departure aerodrome so that the crew member can have a minimum of 24 hours inclusive of a local night at this rest facility arrangement prior to reporting for a flight duty period.

4 Report on exercise of discretion to deviate from approved flight duty or rest periods

4.1 The AOC holder is required under Regulation 179(3)(g) to submit a report to the DGCA within 30 days of a discretion exercised by a crew member to deviate from the approved flight duty or rest periods.

4.2 The report should include details on:

- (a) Date and time of the occurrence
- (b) Aircraft involved
- (c) Flight number and details
- (d) Location
- (e) Crew (including names and appointment) involved
- (f) Details of planned and achieved schedules
- (g) Any other details of circumstances

4.3 The report should be submitted to Flight Standards Division of CAAS.

GUIDANCE 121REG181 GUIDANCE FOR REGULATION 181 OF ANR-121 – USE OF CONTROLLED REST ON THE FLIGHT DECK

- 1 Controlled rest on the flight deck is a fatigue mitigation strategy for flight crew, and is intended as a response to unexpected fatigue experienced during operations. Its use may serve as an indicator to the effectiveness of the AOC holder's fatigue risk management programme. Therefore, the AOC holder should review the occurrences when controlled rests are used (based on reports submitted by pilots-in-command).
- 2 Recommended Procedures for Controlled Rest on the Flight Deck

Note: this list is not exhaustive, nor are all of these procedures necessarily required.

- (a) Only one pilot may take controlled rest at a time in his/her seat. The harness should be used, and the seat positioned to minimise unintentional interference with the controls.
- (b) The autopilot and auto-thrust systems (if available) should be operational.
- (c) Any routine system or operational intervention which would normally require a cross check, should be planned to occur outside controlled rest periods.
- (d) Controlled rest on the flight deck may be used at the discretion of the captain to manage both unexpected fatigue and to reduce the risk of fatigue during higher workload periods later in the flight.
- (e) It should be clearly established who will take rest, and when it will be taken. If the pilot in command requires, the rest may be terminated at any time.
- (f) The pilot in command should define criteria for when his/her rest should be interrupted.
- (g) Hand-over of duties and wake-up arrangements should be reviewed.
- (h) Flight crews should only use controlled rest if they are familiar with the published procedures.
- (i) Some AOC holders involve a third crewmember (not necessarily a pilot) to monitor controlled flight deck rest. This may include a planned wake-up call, a visit to be scheduled just after the planned rest period ends, or a third crewmember on the flight deck throughout controlled rest.
- (j) The controlled rest period should be no longer than 40 minutes, to minimise the risk of sleep inertia on awakening.
- (k) Controlled rest should only be utilised during the cruise period from the top of climb to 20 minutes before the planned top of descent. This is to minimise the risk of sleep inertia.
- (l) A short period of time should be allowed for rest preparation. This should include an operational briefing, completion of tasks in progress, and attention to any physiological needs of either crew member.
- (m) During controlled rest, the non-resting pilot must perform the duties of the pilot flying and the pilot monitoring, be able to exercise control of the aircraft at all times and maintain situational awareness. The non-resting pilot cannot leave his/her seat for any reason, including physiological breaks.
- (n) Aids such as eye shades, neck supports, ear plugs, etc., should be permitted for the resting pilot.

GUIDANCE 121FIFTHSCH GUIDANCE FOR THE FIFTH SCHEDULE OF ANR-121 – FATIGUE RISK MANAGEMENT PROGRAMMES

- 1 Appropriate in-flight rest facilities
 - 1.1 The amount by which the maximum permitted flight duty period in Paragraph 15 in the Fifth Schedule of ANR-121 may be extended is dependent on:
 - (a) the composition and number of flight crew members carried to provide in-flight relief; and
 - (b) the quality of rest facilities provided.
 - 1.2 In-flight rest facilities are categorised as:
 - (a) “Class 1 Rest Facility” which has a bunk or other surface that allows for a flat sleeping position, located separately from both the flight deck and passenger cabin, with due consideration to occupant privacy, temperature and light controls. It should be isolated from disturbance and intrusive noises from doors, galleys, toilets, etc.
 - (b) “Class 2 Rest Facility” means a seat in the passenger cabin that allows for a flat or near flat sleeping position. It should be separated from passengers by at least a curtain to provide privacy and some mitigation of sound level, and is reasonably free from disturbance by passengers or crew members.

Note: A Class 2 Rest Facility can be considered for AOC holders intending to use a Class 2 Rest Facility as part of their FRMS to mitigate fatigue risk in situations where a Class 1 Rest Facility is not provided in the aircraft.

 - (c) “Class 3 Rest Facility” means a seat in the passenger cabin or flight deck that reclines at least 40° from the vertical, providing leg and foot support and is not adjacent to any seat occupied by passengers.
 - 1.3 Class 1 Rest Facilities will satisfy the requirements for horizontal rest facilities referred to in paragraph 15(4) in the Fifth Schedule of ANR-121.
 - 1.4 In the situation where a flight may possibly be conducted with a normal flight crew complement but the AOC holder opts to use augmented flight crew for the purpose of managing fatigue risk, a Class 2 or Class 3 Rest Facility may be considered appropriate for in-flight rest.
 - 1.5 Surfaces that allow for flat sleeping positions, located separately from the passenger cabin, with due consideration to temperature and light controls, isolated from disturbance and intrusive noises from doors, galleys, toilets etc. will satisfy the requirements for horizontal rest facilities referred to in paragraph 16(4) in the Fifth Schedule of ANR-121.
- 2 Day off
 - 2.1 A Day off is used to prevent accumulation of fatigue from consecutive duty assignments. These duty assignments are any task that an AOC holder require a crew member to perform, that may induce fatigue, for example, a flight pattern, a simulator assessment, and classroom training.

2.2 Studies¹ have also shown that people took longer to fall asleep, and spent a longer time being awake at night when they expect to be woken for the purpose of receiving a duty assignment such as when a crew member is on standby. Since the intent of a day off is to allow crew members to recover from fatigue accumulated while on duty, it should not contain a standby period.

3 Development of FRMS

3.1 Part 2 of the Fifth Schedule of ANR-121 contains the requirements of a FRMS that may be approved by the DGCA. As defined, FRMS is data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness. Hence, in order to develop a meaningful FRMS, the AOC holder would have accumulated sufficient operational data and have performed suitable scientific analysis.

3.2 It is therefore expected that prior to implementing such an FRMS, the AOC holder would have operated based on the “Basic Requirements of Fatigue Risk Management” in Part 1 in the Fifth Schedule of ANR-121. The FRMS is considered an evolution from the basic fatigue risk management programme and thus the assessment of a proposed FRMS would draw references to the basic requirements.

¹ ICAO Doc 9966: Chapter 2 – The scientific principles of fatigue management. Second Edition, Version 2 (Revised) 2020. Pg 2-8 – 2-10.