

### Air Operations — Fatigue of Flight Crew

Revision 2  
27 October 2006

#### **General**

Civil Aviation Authority Advisory Circulars contain information about standards, practices, and procedures that the Director has found to be acceptable for compliance with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate Advisory Circular.

#### **Purpose**

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with requirements relating to the development of a flight crew fatigue management system in accordance with Parts 121, 125, and 135.

#### **Related Rules**

This Advisory Circular relates specifically to Subpart K of Parts 121, 125, and 135.

#### **Change Notice – Revision 2**

Removed the exception in the last paragraph of the *General Restrictions* section on Page 4 as the references to flights made “in the interests of safety or health of any person” is a different (and lower) test than that required by S13A of the Act for breaching the provisions of the Act or Rules made under the Act.

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## Introduction

The following flight and duty time scheme is an example scheme suitable for scheduled air operations under Parts 121 and 125 and air transport operations under Part 135.

*The scheme is a complete scheme and is designed to be used in its entirety. As such the term shall be used in the context of using the complete scheme.*

## Definitions

**Adequate rest facilities** means rest facilities considered by the Director to be sufficiently segregated and comfortable so as to provide suitable rest for resting flight crew members, having regard to the service concerned:

**Air operations** means air operations in accordance with Part 121 or Part 125 and air transport operations in accordance with Part 135:

**Disrupted schedule** means a schedule that by reason of circumstance outside the control of the operator is prevented from being completed within its scheduled time:

**Duty period** means any continuous period throughout which a flight crew member is required by an operator to be on duty or available for duty, whether on the ground or in the air:

*Where a flight crew member is required by an operator to be on duty or available for duty for two or more periods separated by an interval of less than 10 hours, the periods shall be deemed continuous, starting when the first of the periods begins and finishing when the last period ends.*

**External operation** means an operation, excluding an operation to the Chatham Islands, the greater part of which is carried out outside the territorial waters of New Zealand:

**Internal operation** means an operation that is carried out between places within New Zealand, and includes an operation between the islands of New Zealand:

**Rest period** means any period of time on the ground during which a flight crew member is relieved of all duties by the operator:

**Standby period** means the period of time during which a flight crew member is required to hold himself available for active duty:

**Stay in an area** means a stopover in an area for a period that includes facility for two normal night's rest; that is, two consecutive periods between midnight and 6 am local time:

**Tour of duty** means the period of time commencing at the start of duties at home base prior to a series of flights and ending at home base on completion of the duties associated with series of flights:

*When a flight crew member is based temporarily at a place other than his home base, that place, for the period of the detachment, will be regarded as his home base:*

**Total hours of duty** means the sum of the duty periods within any particular period that a flight crew member is at the disposal of an operator.

## **General**

### **General restrictions**

When, during a particular duty period, a flight crew member is engaged in air operations which have differing flight time limitations, the most restrictive flight time will apply.

A flight crew member shall not carry out other flying while employed by an air operator when such flying, in addition to that in air operations, will exceed the appropriate flight time limitations specified herein.

When, in connection with any business of operating an aircraft, a flight crew member flies in any aircraft otherwise than as a member of that aircraft's operating crew, he or she shall be treated as being on duty whether he or she flies as an extra member of its crew or as a passenger.

The total hours of duty of any flight crew member in any consecutive 30-day period shall not exceed 200 hours.

In meeting the provisions of this document an operator shall not roster a flight crew member on a flight or series of flights that cannot be completed within the requirements of these limitations on at least 80 percent occasions.

The basic flight time limitations and the general provisions relating thereto as specified herein or as otherwise approved by the Director shall apply alike to all air operations.

### **Standby**

When a flight crew member is required to carry out standby at an aerodrome or at a place where adequate facilities for rest are not available the time from the beginning of the standby period until he or she is required to fly or is released from duty shall be regarded as a part of a duty period.

When standby is carried out at home or at a place away from home where adequate rest facilities are available, the standby period shall not be regarded as part of any duty period or any rest period.

Standby at home or at a place away from home where adequate rest facilities are available shall not exceed one continuous period of 16 hours. When followed by a period of active duty, the total elapsed time from the beginning of standby to the end of that duty period shall not exceed 23 hours.

A standby period shall only be considered a separate period when the intervening rest period between the standby period and a period of active duty or a further period of standby is not less than 10 hours.

### **Transport / duty time**

When a flight crew member is transported by company surface transport:

Before the beginning of a duty period, time involved in transporting the flight crew member to the normal place of work for that base shall not be regarded as part of any duty period or any rest period.

At the beginning of a duty period, time involved in transporting the flight crew member to a place of work other than the normal for that base shall be considered duty time for the purpose of these limitations.

At the completion of a duty period, time involved in transporting a flight crew member to his company City office or place of rest, whichever is applicable, shall not be regarded as part of any duty period or of any rest period.

### **Rest**

When, at the end of a duty period, the requirements of two or more rest periods coincide, the longest rest period applicable in the particular circumstances shall be taken.

A tour of duty which includes a duty period exceeding 8 hours, including any time between midnight and 6 am local time (departure point) on two successive nights may not be flown by any flight crew member more often than once in any 7 consecutive days or more often than on two occasions in any 28-day period.

Any duty period shall be followed by a rest period of not less than 10 hours except where it is otherwise stated in this document.

### **Rest/facilities**

When at the end of a duty period, a rest period is given at any place other than home base; facilities shall be available for horizontal rest in an environment conducive to rest.

When, to preserve the sleep/wake cycle or for other reasons, it is necessary for a flight crew member to sleep at times other than between the hours of midnight and 6 am local time, the rest facility must be capable of giving the same opportunity for sleep as it would be expected to give between the hours of midnight and 6 am local time.

When, due to diversion or disruption, the rest facility is not to the required standard, the applicable rest period may be reduced at the discretion of the pilot-in-command to not less than 10 consecutive hours in order that the flight may be continued to the planned place of rest. When advantage is taken of this dispensation, the balance of the required rest period must be added to the applicable rest period at the planned place of rest.

When rest facilities are required to be provided on an aircraft properly segregated first or business class or equivalent seats must be provided for resting flight crew members.

When the planned duty period is in excess of 14 hours, the Director, having regard to:

- (i) the length of the immediately preceding duty and rest periods:
- (ii) the time of day of the flight:

- (iii) the ground accommodation at the last place of rest:
- (iv) the route to be flown:

may require bunks or berths to be provided instead of the required standard of seats on specified route sectors. These bunks or berths should provide, as far as possible, maximum opportunity for comfortable and uninterrupted rest.

## **Internal operations**

### **Single-pilot crews**

#### **Instrument Flight Rules (IFR) Operations**

A pilot of an aircraft which carries one pilot on internal air operations planned wholly or in part under IFR shall be subject to the following flight time limitations:

##### ***Flight time***

The pilot shall not be rostered to fly in excess of 6 hours in any one duty period. A duty period already commenced may be extended in flight time to 6 hours 30 minutes to complete a disrupted schedule.

The pilot shall not fly, and an operator shall not roster the pilot to fly, in excess of:

- (i) 30 hours in any 7 consecutive days:
- (ii) 90 hours in any 30 consecutive days:
- (iii) 250 hours in any 90 consecutive days.

##### ***Duty period***

The pilot shall not be rostered for a duty period of more than 11 hours.

##### ***Meals***

During any duty period exceeding 4 hours the pilot shall have a rostered meal period on the ground of not less than 30 minutes free of duty. Provision shall be made for such a meal period within the first 5 hours of a duty period and thereafter at intervals of not more than 4 hours from the completion of the preceding meal period.

##### ***Rest***

When the pilot has flown more than 6 hours, or has been on duty more than 11 hours in any 24 consecutive hours he or she shall have, on completion of that duty period, a rest of not less than 12 consecutive hours, including the hours between midnight and 6 am or extended to include that period, up to a maximum of 24 consecutive hours:

When the pilot has flown more than 12 hours or been on duty more than 22 hours in any 48 consecutive hours, he or she shall have, on completion of that duty period, a rest period of not less than 24 consecutive hours:

In addition to any rest period applicable at the end of the pilot's last duty period he or she shall have a recreational period of not less than 24 consecutive hours free of all duties at least once in every 7 consecutive days. If, because of the length of the

required rest period, this is not possible he or she shall have this recreational period free of all duties at the conclusion of that rest period:

### **Visual Flight Rules (VFR) Operations**

A pilot of an aircraft which carries one pilot on internal air operations, planned to be conducted wholly under VFR, shall be subject to the following flight time limitations:

#### ***Flight time***

The pilot shall not be rostered to fly in excess of 8 hours in any one duty period. A duty period already commenced may be extended in flight time to 8 hours 30 minutes to complete disrupted schedules.

The pilot shall not fly, and an operator shall not roster the pilot to fly, in excess of:

- (i) 35 hours in any 7 consecutive days:
- (ii) 100 hours in any 28 consecutive days:
- (iii) 300 hours in any 90 consecutive days.

#### ***Duty period***

The pilot shall not be rostered for a duty period of more than 11 hours but once commenced a duty may be extended to 12 hours to complete a disrupted schedule.

#### ***Meals***

During any duty period exceeding 4 hours the pilot shall have a rostered meal period on the ground of not less than 30 minutes free of any duty. Provision shall be made for such a meal period within the first 5 hours of a duty period and thereafter at intervals of not more than 4 hours from the completion of the preceding meal period.

#### ***Rest***

When the pilot has flown more than 8 hours, or has been on duty more than 11 hours in any 24 consecutive hours, he or she shall have, on completion of that duty period, a rest period of not less than 12 consecutive hours including the hours between midnight and 6 am, or extended to include that period up to a maximum of 24 consecutive hours.

When the pilot has flown more than 16 hours or been on duty more than 22 hours in any 48 consecutive hours, he or she shall have, on completion of that duty period, a rest period of not less than 24 consecutive hours:

In addition to any rest period applicable at the end of the pilot's last duty period he or she shall have a recreational period of not less than 24 consecutive hours free of all duties at least once in every 7 consecutive days. If, because of the length of the required rest period, this is not possible he or she shall have this recreational period free of all duties at the conclusion of that rest period:

### **Two-pilot crews**

A pilot of an aircraft which carries two pilots on internal air operations shall be subject to the following flight time limitations:

### ***Flight time***

The pilot shall not be rostered to fly in excess of 8 hours in any one duty period. A duty period already commenced may be extended in flight time to 8 hours 30 minutes to complete a disrupted schedule.

The pilot shall not fly, and an operator shall not roster the pilot to fly, in excess of:

- (i) 35 hours in any 7 consecutive days:
- (ii) 100 hours in any 28 consecutive days:
- (iii) 300 hours in any 90 consecutive days.

### ***Duty period***

The pilot shall not be rostered for a duty period of more than 11 hours but once commenced a duty may be extended to 12 hours to complete a disrupted schedule.

### ***Rest***

When the pilot has flown more than 8 hours, or has been on duty more than 11 hours in any 24 consecutive hours, he or she shall have, on completion of that duty period, a rest period of not less than 12 consecutive hours, including the hours between midnight and 6 am or extended to include that period, up to a maximum of 24 consecutive hours.

When the pilot has flown more than 16 hours or been on duty more than 22 hours in any 48 consecutive hours, he or she shall have, on completion of that duty period, a rest period of not less than 24 consecutive hours:

When the pilot has flown more than 20 hours or been on duty more than 29 hours in any 72 consecutive hours, he or she shall have, on completion of that duty period, a rest period of not less than 24 consecutive hours:

When, for any reason, a pilot has flown for more than 8 hours or where a duty period exceeds 11 hours, he or she shall have, on completion of that duty period and in addition to his or her rest period after that duty or series of duties, a consecutive rest period of one hour for each 15 minutes, or the greater part thereof, flight time exceeds 8 hours or duty time exceeds 11 hours:

When, for any reason outside the pilot's control, or by an approved dispensation, the pilot has flown more than 8 hours 30 minutes or has been on duty more than 12 hours in any one duty period, he or she shall have, on completion of that duty period, a rest period of not less than 24 consecutive hours:

In addition to any rest period applicable at the end of the pilot's last duty period, he or she shall have a recreational period of 24 consecutive hours at home base free of all duties at least once on every 7 days. If, because of the length of the required rest period, this is not possible he or she shall have this recreational period free of all duties at the conclusion of that rest period:

### **Flight crew members other than pilots:**

The flight time limitations as set out under **Two pilot crews** shall apply equally to any flight crew member who is assigned for duty on an aircraft engaged in internal air operations as part of a crew which has two pilots.



## **External operations — turbo-jet aircraft**

### **Two-pilot crews**

A pilot of an aircraft which carries two pilots on external operations shall be subject to the following flight time limitations.

#### ***Flight time***

The pilot shall not be rostered to fly in excess of 8 hours in any one duty period. A duty period already commenced may be extended in flight time to 9 hours to complete a disrupted schedule.

A pilot shall not fly and an operator shall not roster a pilot to fly in excess of:

- (i) 35 hours in any 7 consecutive days:
- (ii) 100 hours in any 28 consecutive days:
- (iii) 250 hours in any 84 consecutive days.

#### ***Duty period***

The pilot shall not be rostered for a duty period of more than 11 hours but once commenced a duty may be extended to 13 hours to complete a disrupted schedule.

#### ***Rest***

When a pilot flies more than 8 hours or has been on duty more than 11 hours in any 24 consecutive hours, he or she shall have, at the completion of that duty period, a rest period of not less than 12 consecutive hours, including the hours between midnight and 6 am local time, or 14 consecutive hours:

When a pilot has flown more than 16 hours or has been on duty for more than 22 hours in any 48 consecutive hours, he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours:

When a pilot has flown more than 20 hours or been on duty for more than 29 hours in any 72 consecutive hours, he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours:

On return to home base after a tour of duty a pilot's rest period shall not be less than twice the number of hours flown as an operating crew member since leaving home base on that tour of duty. Except that, when a tour of duty includes a stay in an area having a time difference of more than 2 hours, the rest period at home base on completion of the tour of duty shall not be less than 72 consecutive hours.

When a pilot is temporarily detached at a place other than home base and the tour of duty is completed at that place, the rest period applicable to home base shall apply.

When a pilot begins a tour of duty at home base and completes it at a place of detachment or begins a tour of duty at the place of detachment and completes it at home base, the rest period applicable shall be that which applies when the place of detachment is also regarded as home base.

In addition to the rest period applicable at the end of the pilot's last duty period, he or she shall have a recreational period of 24 consecutive hours free of all duties at least

once in every 7 consecutive days. If, because of the length of the required rest period, this is not possible the pilot shall have this recreational period free of all duties at the conclusion of that rest period.

When at home base, the rest period applicable and the recreational 24 hours must together include a continuous period embracing the hours between midnight and 6 am local time on two successive nights or extended to include that period.

### **Three-pilot crews**

#### **Crew composition**

For the purpose of this document a three-pilot flight crew shall include:

At least two pilots normally rostered to act as pilot-in-command for the particular class of operation; or

One pilot normally rostered to act as pilot-in-command for the particular class of operation and two pilots possessing qualifications approved by the Director for the operation.

#### **Three-pilot crew limitations**

A pilot of an aircraft that carries a three-pilot crew, as defined above, on external operations shall be subject to the following flight time limitations:

#### ***Flight time***

A pilot shall not fly, and an operator shall not roster a pilot to fly, in excess of:

- (i) 35 hours in any 7 consecutive days:
- (ii) 100 hours in any 28 consecutive days:
- (iii) 250 hours in any 84 consecutive days.

#### ***Duty period***

When the flight crew includes at least 2 pilots normally rostered to act as pilot-in-command for the particular class of operation:

- (i) a pilot shall not be rostered for a duty period of more than 18 hours:
- (ii) A duty period already commenced may be extended in duty time to 20 hours to complete a disrupted schedule:

When the flight crew includes one pilot normally rostered to act as pilot-in-command for the particular class of operation and two pilots possessing qualifications approved by the Director for the operation:

- (i) A pilot shall not be rostered for a duty period of more than 14 hours:
- (ii) A duty period already commenced may be extended in duty time to 16 hours to complete a disrupted schedule.

## ***Rest***

Within each duty period the pilot-in-command shall establish a roster of periods of active duty and rest for each pilot which may only be varied at the discretion of the pilot-in-command.

On completion of the duty period a pilot shall have a rest period on the ground calculated as follows:

- (i) For the first 11 hours duty – 10 consecutive hours:
- (ii) For each subsequent hour's duty – 2 additional hours, up to a maximum of 24 consecutive hours:

When a pilot has been on duty for more than 24 hours in 48 consecutive hours he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours.

When a pilot has been on duty for more than 32 hours in any 72 consecutive hours he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours.

On return to home base after a tour of duty, the pilot's rest period shall not be less than twice the number of hours flown as an operating flight crew member since leaving home base on that tour of duty. Except that, when a tour of duty includes a stay in an area having a time difference of more than two hours, the rest period at home base on completion of the tour of duty shall not be less than 72 consecutive hours.

When a pilot is temporarily detached at a place other than home base and a tour of duty is completed at that place, the rest period applicable to home base shall apply.

When a pilot begins a tour of duty at home base and completes it at a place of detachment or begins a tour of duty at the place of detachment and completes it at home base, the rest period applicable shall be that which applies when the place of detachment is also regarded as the pilot's home base.

In addition to the rest period applicable at the end of a pilot's last duty period, he or she shall have a recreational period of 24 consecutive hours free of all duties at least once in every 7 consecutive days. If, because of the length of the required rest period, this is not possible, the pilot shall have this recreational period free of all duties at the conclusion of that rest period.

When at home base, the rest period applicable and the recreational 24 hours must together include a continuous period embracing the hours between midnight and 6 am on two successive nights or extended to include that period.

Adequate rest facilities are to be provided on the aircraft.

## **Flight Engineers**

### **One engineer**

A flight engineer of an aircraft that carries only one flight engineer as part of a crew on external operations shall be subject to the following flight time limitations:

***Flight time***

The flight crew member shall not be rostered to fly in excess of 9 hours in any one duty period. A duty period already commenced may be extended in flight time to 10 hours to complete a disrupted schedule.

The flight crew member shall not fly, and an operator shall not roster the member to fly, in excess of:

- (i) 35 hours in any 7 consecutive days:
- (ii) 100 hours in any 28 consecutive days:
- (iii) 250 hours in any 84 consecutive days.

***Duty period***

The flight crew member shall not be rostered for a duty period of more than 12 hours but once commenced a duty may be extended to 14 hours to complete a disrupted schedule.

***Rest***

When the flight crew member has flown more than 9 hours or has been on duty more than 12 hours in any 24 consecutive hours he or she shall have, at the completion of that duty period, a rest period of not less than 12 consecutive hours, including the hours between midnight and 6 am local time, or 14 consecutive hours.

When the flight crew member has flown more than 18 hours or has been on duty for more than 24 hours in any 48 consecutive hours he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours.

When the flight crew member has flown more than 23 hours or has been on duty for more than 32 hours in any 72 consecutive hours he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours.

On return to home base after a tour of duty the flight crew member's rest period shall not be less than twice the number of hours flown since leaving home base on that tour of duty. Except that, when a tour of duty includes a stay in an area having a time difference of more than 2 hours, the rest period at the home base on completion of a tour of duty shall not be less than 72 consecutive hours.

- When the flight crew member is temporarily detached at a place other than home base and a tour of duty is completed at that place, the rest period applicable to home base shall apply.
- When the flight crew member begins a tour of duty at home base and completes it at the place of detachment or begins a tour of duty at the place of detachment and completes it at home base, the rest period applicable shall be that which applies when the place of detachment is also regarded as home base.

In addition to the rest period applicable at the end of the flight crew member last duty period, he or she shall have a recreational period of 24 consecutive hours free of all duties at least once in every 7 consecutive days. If, because of the length of the

required rest period, this is not possible, the flight crew member shall have this recreational period free of all duties at the conclusion of that rest period.

- When at home base, the rest period applicable and the recreational 24 hours must together include a continuous period embracing the hours between midnight and 6 am on two successive nights or extended to include that period.

## **Two engineers**

### ***Flight time***

A flight engineer of an aircraft which carries two flight engineers or one flight engineer and a pilot who has completed an approved training course and who is certified by the company to give in-flight relief to the flight engineer shall be subject to the following flight time limitations:

The flight crew member shall not fly as an operating crew member, and an operator shall not roster the member to fly as an operating crew member, in excess of:

- (i) 35 hours in any 7 consecutive days:
- (ii) 100 hours in any 28 consecutive days:
- (iii) 250 hours in any 84 consecutive days.

### ***Duty period***

The flight crew member shall not be rostered for a duty period exceeding 18 hours.

A duty period already commenced may be extended in duty time to 20 hours to complete disrupted services.

Within each duty period the pilot-in-command shall establish a roster of periods of active duty and rest for each flight crew member which may only be varied at the discretion of the pilot-in-command.

### ***Rest***

On completion of the duty period the flight crew member shall have a rest period on the ground calculated as follows:

- (i) For the first 11 hours – 10 consecutive hours:
- (ii) For each subsequent hour's duty – 2 additional hours, up to a maximum of 24 consecutive hours.

When the flight crew member has been on duty for more than 24 hours in any consecutive 48 hours he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours.

When the flight crew member has been on duty for more than 32 hours in any consecutive 72 hours he or she shall have, at the completion of that duty period, a rest period of not less than 24 consecutive hours.

On return to home base after a tour of duty the flight crew member's rest period shall not be less than twice the number of hours flown as an operating crew member since

leaving home base on that tour of duty. Except that, when a tour of duty includes a stay in an area having a time difference of more than 2 hours the rest period at the home base on completion of a tour of duty shall not be less than 72 consecutive hours.

- When the flight crew member is temporarily detached at a place other than home base and a tour of duty is completed at that place the rest period applicable at home base shall apply.
- When the flight crew member begins a tour of duty at home base and completes it at a place of detachment or begins a tour of duty at the place of detachment and completes it at home base, the rest period applicable shall be that which applies when the place of detachment is also regarded as home base.

In addition to the rest period applicable at the end of the flight crew member's last duty period he or she shall have a recreational period of 24 consecutive hours free of all duties at least once in every 7 consecutive days. If, because of the length of the required rest period, this is not possible, the flight crew member shall have this recreational period free of all duties at the conclusion of that rest period.

- When at home base, the rest period applicable and the recreational 24 hours must together include a continuous period embracing the hours between midnight and 6 am on two successive nights or extended to include that period.

Adequate rest facilities are to be provided on the aircraft.