

**EXPLANATORY NOTE**  
 This document is based on **Air OPS Annex III – Part-ORO** assembles the following publications ...

REGULATION (EC) No 216/2008	BASIC REGULATION (IR)
COMMISSION REGULATION (EU) No 83/2014	<b>IMPLEMENTING RULES (IR)</b>
Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Annex III [Part-ORO] of (EU) 965/2012 Consolidated version including Issue 2, Amendment 11 May 2017 *	<b>ACCEPTABLE MEANS OF COMPLIANCE (AMC)</b> <sub>IR</sub> GUIDANCE MATERIAL (GM) <sub>IR</sub>
Certification Specifications and Guidance Material for CAT by Aeroplane – Scheduled and Charter Ops. CS-FTL.1, Initial Issue 31 January 2014	<b>CERTIFICATION SPECIFICATIONS (CS)</b> GUIDANCE MATERIAL (GM) <sub>CS</sub>

\* Comm. Reg. (EU) 965/2012 (*AIR OPS*) lays down technical requirements and administrative procedures to Regulation (EC) 216/2008 (*BASIC REGULATION*)  
*Note: Annex III of (EU) 965/2012 does not contain a 'Subpart FTL' which is published under Comm. Reg. (EU) 83/2014 (ORO.FTL)*  
 ... also see *AIR OPS Easy Access* → p. 242ff → *Air OPS Easy Access Rules\_Rev.09\_May 2017.pdf*

- ✓ Some elements of the implementing rules or certification specifications are shown in the centre column for the purpose to reduce the number of pages needed.
- ✓ **EASA FAQs** are boxed in light green
- ✓ **BASICS** → (... "how to apply" by **ECA**) are boxed in light blue
- ✓ Rules relating to ORO.FTL.120 **Fatigue Risk Management ( FRM )** are highlighted.

<b>ORO.FTL.100 Scope and duty</b>	This subpart establishes the requirements to be met by an operator and its crew members with regard to flight time limitations and rest requirements for crew members
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CS FTL.1.100 Applicability	These Certification Specifications are applicable to commercial air transport by aeroplanes for scheduled and charter operations, excluding emergency medical service (EMS), air taxi and single pilot operations.
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<b>ORO.FTL.105 Definitions</b>	For the purpose of this subpart [Subpart FTL], the following definitions shall apply...
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(1) **“ACCLIMATISED”** means a state in which a crew member’s circadian biological clock is synchronised to the time zone where the crew member is. A crewmember is considered to be acclimatised to a 2-hour wide time zone surrounding the local time at the point of departure. When the local time at the place where a duty commences differs by more than 2 hours from the local time at the place where the next duty starts, the crew member, for the calculation of the maximum daily flight duty period, is considered to be acclimatised in accordance with the values in Table 1.

(...see next column → Table 1)

**“B”** means ... acclimatised to the local time of the departure time zone

**“D”** means ... acclimatised to the local time where the crew member starts his/her next duty

**“X”** means ... that the crew member is in an unknown state of acclimatisation;

**GM1 ORO.FTL.105 (1) ACCLIMATISED**

(a) A crew member remains acclimatised to the local time of his/her reference time during 47 hours 59 minutes after reporting no matter how many time zones he/she has crossed.

(b) The maximum daily FDP for acclimatised crewmembers is determined by using table 1 of ORO.FTL.205 (b)(1) with the reference time of the point of departure. As soon as 48 hours have elapsed, the state of acclimatisation is derived from the time elapsed since reporting at reference time and the number of time zones crossed.

Table 1

Time difference between reference time and local time where crew member starts the next duty	Time elapsed since reporting at reference time				
	< 48	48 – 71:59	72 – 95:59	96 – 119:59	≥ 120
Line below represents “2-hour wide time zone” after departure:					
≤ 2	D	D	D	D	D
< 4	B	D	D	D	D
≥ 4 and ≤ 6	B	X	D	D	D
> 6 and ≤ 9	B	X	X	D	D
> 9 and ≤ 12	B	X	X	X	D

**BASICS (Acclimatization)**

The principle of “acclimatisation” does not distinguish between home base or any other location. At all times the local time of a specific time zone is individually attributed to any crew member and used as a personal reference time.

**The allocation of this reference time is an ongoing process for each crew member and must be performed as a background task along with any individual scheduling.**

The process of de- and re-synchronisation runs in unsteady cycles along with the crew members individual schedule. Once de-synchronised, specific rest requirements have to be met before the CM will re-synchronise. The requirements are different for a re-synchronisation either within a rotation or at home base, since rest at home base is considered to be more effective than rest away from home base.

To find a start point a CM is always – irrespectively from any previous duties – acclimatised to the home base’s time zone (status **“B”**) after having spent 5 consecutive local nights of rest at the home base. (→ see CS.FTL.1.235 (b)(3)(i))

**Note:** To comply with CS.FTL.1.235(b)(3)(i) and to justify the assumed effectiveness at home base this rest period must not be interspersed with any duty periods between the local nights.

**Leaving home base...**

... and assuming that a CM is acclimatised, two fundamentally different scenarios may follow:

**Scenario A (SYNCHRONISED)**

(c) A crew member is considered to be in an unknown state of acclimatisation after the first 48 hours of the rotation have elapsed unless he or she remains in the first arrival destination time zone (either for rest or any duties) in accordance with the table in ORO.FTL.105(1).

(d) Should a crew member's rotation include additional duties that end in a different time zone than his or her first arrival destination's time zone while he or she is considered to be in an unknown state of acclimatisation, then the crew member remains in an unknown state of acclimatisation until he or she:

(1) has taken the rest period required by CS FTL.235(b)(3) at home base;

(2) has taken the rest period required by CS FTL.235(b)(3) at the new location; or

(3) has been undertaking duties starting at and returning to the time zone of the new location until he or she becomes acclimatised in accordance with the values in the table in ORO.FTL.105(1).

*The time difference between reference time and local time at the place of rest is 2 hrs or less*

After termination of the first/any duty period the CM is considered to be promptly acclimatised to the local time of the place of rest. For the start of the next succeeding duty, the reference time has jumped to this time zone (status "B"). As a result, "time zone hopping" with multiple FDPs around the world is possible – the CM will stay acclimatised as long as the local time at the next succeeding place of rest will never differ by more than two hours to the local time of the place of departure.

#### Scenario B (DE-SYNCHRONISED)

*The time difference between reference time and the local time at the place of rest is more than 2 hrs*

After reporting at the time zone the CM is acclimatised to, he/she is considered to stay acclimatised to this time zone for the next 48 hrs (status "B"); i.e. should the CM report for the next FDP within these 48 hrs the reference time zone's local time is used to determine FDP limits.

Once these first 48 hrs have elapsed, the CM will enter a state of unknown acclimatisation (X).

At the end of a re-synchronization period a CM reaches status "D". Status "B" and "D" both indicate that a CM's body clock is synchronised again to a reference time. For a given time difference the re-synchronisation period must be at least as long as the required "time elapsed" from Table 1 of ORO.FTL.105(1) to be sufficient for re-synchronization. Once it has elapsed "reference time" jumps to the local time of the start of the next duty.

**B** eginning ⇒ time elapsed ⇒ en **D** ⇔ **B** eginning ⇒ time elapsed ⇒ en **D**

< 48hrs > < (X) > < 48hrs > < (X) >

< time elapsed > < time elapsed >

**Note:** During the "time elapsed" re-synchronisation must be possible. Since synchronisation requires a daily routine which runs in tune with the local time at the place of rest, rest opportunities shall be available during the local night of a constant local time.

Should a CM's rotation include duties which take place during the "time elapsed" – i.e. during the re-synchronisation phase – these duties shall ...

... either depart from and return to the time zone of rest and the CM will still become synchronised again after the required period from Table 1 ORO.FTL.105(1) has elapsed; or

... the "time elapsed" shall start all over again upon arrival in the new time zone.

**Upon return to home base...**

To determine the state of acclimatisation, the two following criteria should be applied:

- (i) the greater of the time differences between the time zone where he or she was last acclimatised or the local time of his or her last departure point and the new location; and
- (ii) the time elapsed since reporting at home base for the first time during the rotation.

GM1 ORO.FTL.105 (2) ACCLIMATISED 'POINT OF DEPARTURE'  
The point of departure refers to the reporting point for a flight duty period or positioning duty after a rest period.

GM1 ORO.FTL.105 (3) ACCLIMATISED 'TIME ELAPSED SINCE REPORTING AT REFERENCE TIME'  
The time elapsed since reporting at reference time for operations applying CS FTL.1.235 (b)(3)(ii) at home base refers to the time elapsed since reporting for the first time at home base for a rotation.

... the CM remains in an unknown state of acclimatisation until he/she has taken a rest period according to:

> ORO.FTL.235(a) for a rotation that involved less than 4 hours of time difference; or...

> CS.FTL.1.235 (b)(3)(i) for a rotation that involved 4 hours of time difference or more between any two places of rest or between any place of rest and the home base.

For the purpose to determine the minimum number of consecutive local nights encompassed by that rest period the following criteria apply:

> the greater of the time difference between either...

... the reference time prior to the start of the rotation and the local time of the most distant time zone of a place of rest during the rotation; or...

... the largest time difference between any two places of rest during...

...should be applied.

> the time elapsed starts with first reporting at the CM's home base and ends with the next return to that home base.

#### Determination of max. FDT limits...

Status	"B" + "D" (reference time's time zone)	"X" (no reference required)
max. daily FDP	→ ORO.FTL.205 (b)(2) Table 2	→ ORO.FTL.205 (b)(2) Table 3
ext. of FDP without in-flight rest	→ CS.FTL.1.205 (b)	→ ORO.FTL.205 (b)(2) Table 4
ext. FDP due to in-flight rest	→ CS.FTL.1.205 (c)	→ CS.FTL.1.205 (c)
Split Duty	→ CS.FTL.1.220	→ <b>not available!</b>

← (GM - TIME ELAPSED) touching home base during a rotation with a total time zone difference of 4 hrs. or more does not shorten the rest (resynchronization) according to CS.FTL.1.235 (b)(3)(i)

(2) "REFERENCE TIME" means the local time at the reporting point situated in a 2-hour wide time zone band around the local time where a crew member is acclimatised;

GM1 ORO.FTL.105 (2) REFERENCE TIME

(a) Reference time refers to reporting points in a 2-hour wide time zone band around the local time where a crewmember is acclimatised.

(b) Example: A crewmember is acclimatised to the local time in Helsinki and

#### BASICS (Reference Time)

Reference time always refers to the time zone where the crew member is or was acclimatized last.

It is used to determine FDP limits as well as whether a duty is disruptive (A crew member must still be acclimatized when reporting for duty that this duty may be counted as disruptive).

<p>reports for duty in London. The reference time is the local time in London.</p>	<p>← (2) Provides the option to merge crews from different locations at a common point of departure under the same duty restrictions.</p> <p>NOTE: It is possible to leave home base starting a rotation <b>without</b> being acclimatized to home base. This applies to crew members who are acclimatized to a time zone with a difference of more than 2 but less than 4 hours to home base time and a second departure out of home base within 48 hours departing that time zone.</p>
<p>(3) "ACCOMMODATION" means, for the purpose of standby and split duty, ...</p> <p>...a quiet and comfortable place not open to the public with the ability to control light and temperature, equipped with adequate furniture that provides a crew member with the possibility to sleep, with enough capacity...</p> <p>...to accommodate <b>all crew members</b> present at the same time and with access to food and drink;</p> <p>GM1 ORO.FTL.105 (3)      ADEQUATE FURNITURE FOR 'ACCOMMODATION'</p> <p>Adequate furniture for crewmember accommodation should include a seat that reclines at least 45° back angle to the vertical, has a seat width of at least 20 inches (50 cm) and provides leg and foot support.</p>	<p><b>FAQ - ORO.FTL 105(3)</b></p> <p><i>The definition in ORO.FTL.105 (3) lists criteria for "accommodation". Airport crew lounges as such are not excluded as long as they fulfil all criteria listed in the definition. Single occupancy is not a criterion. This means that shared hotel rooms, as long as they fulfil all criteria listed in the definition, could be used as accommodation.</i></p>
<p>(4) "SUITABLE ACCOMMODATION" means, for the purpose of standby, split duty, and <b>rest</b>, ...</p> <p>a separate room for <b>each crew member</b> located in a quiet environment and equipped with a bed, which is sufficiently ventilated, has a device for regulating temperature and light intensity, and access to food and drink;</p>	
<p>(5) "AUGMENTED FLIGHT CREW" means a flight crew which comprises more than the minimum number required to operate the aircraft, allowing each flight crew member to leave the assigned post, for the purpose of in-flight rest, and to be replaced by another appropriately qualified flight crew member;</p>	<p><b>BASICS (Augmented Flight Crew)</b></p> <p>When various FDP limits apply within one crew the most limiting must be used.</p>
<p>(6) "BREAK" means a period of time within a flight duty period, shorter than a rest period, counting as duty and during which a crew member is free of all tasks;</p>	
<p>(7) "DELAYED REPORTING" means the postponement of a scheduled FDP by the operator before a crew member has left the place of rest;</p>	

<p>(8) <b>"DISRUPTIVE SCHEDULE"</b> means a crew member's roster which disrupts the sleep opportunity during the optimal sleep time window by comprising an FDP or a combination of FDPs which encroach, start or finish during any portion of the day or of the night where a crew member is acclimatised. A schedule may be disruptive due to early starts, late finishes or night duties.</p> <p>(a) <b>"EARLY TYPE"</b> of disruptive schedule means:</p> <ul style="list-style-type: none"> <li>(i) for <b>"EARLY START"</b> a duty period starting in the period between 05:00 and 05:59 in the time zone to which a crew member is acclimatised; and</li> <li>(ii) for <b>"LATE FINISH"</b> a duty period finishing in the period between 23:00 and 01:59 in the time zone to which a crew member is acclimatised;</li> </ul> <p>(b) <b>"late type"</b> of disruptive schedule means:</p> <ul style="list-style-type: none"> <li>(i) for <b>"EARLY START"</b> a duty period starting in the period between 05:00 and 06:59 in the time zone to which a crew member is acclimatised; and</li> <li>(ii) for <b>"LATE FINISH"</b> a duty period finishing in the period between 00:00 and 01:59 in the time zone to which a crew member is acclimatised;</li> </ul> <p><b>GM1 ORO.FTL.105 (8) DETERMINATION OF DISRUPTIVE SCHEDULES</b></p> <p>If a crewmember is acclimatised to the local time at his/her home base, the local time at the home base should be used to consider an FDP as 'disruptive schedule'. This applies to operations within the 2-hour wide time zone surrounding the local time at the home base, if a crewmember is acclimatised to the local time at his/her home base.</p>	<p><b>FAQ – ORO.FTL 105 (8)</b></p> <p><i>A schedule is rated "disruptive" or "not disruptive" in reference to the time zone where the crew member was assumed to be acclimatized last; i.e. the applicable reference time.</i></p> <p><i>NOTE: A duty can only be classed as disruptive if a crew member is acclimatised when reporting.</i></p> <p><i>Thus...</i></p> <p><i>... disruptive schedules must always be considered within time zone differences of less than 4 hours to reference time since crew members stay acclimatized at all times.</i></p> <p><b>NOTE:</b></p> <p>GM 1 ORO.FTL.105 (8) could lead to the following consequence: The same schedule could be rated "disruptive" or "not disruptive" for different members of the same crew since the individual point of acclimatization and the individual reporting time (flight crew vs. cabin) must be observed.</p>
<p>(9) <b>"NIGHT DUTY"</b> means a duty period encroaching any portion of the period between 02:00 and 04:59 in the time zone to which the crew is acclimatised;</p>	<p>← (9) i.e. encroaches the WOCL</p>
<p>(10) <b>"DUTY"</b> means any task that a crew member performs for the operator, including flight duty, administrative work, giving or receiving training and checking, positioning, and some elements of standby;</p> <p><b>GM1 ORO.FTL.105 (10) ELEMENTS OF STANDBY FOR DUTY</b></p> <p>ORO.FTL.225(c) and (d) and CS FTL.1.225 (b)(2) determine which elements of standby count as duty.</p>	
<p>(11) <b>"DUTY PERIOD"</b> means a period which starts when a crew member is required by an operator to report for or to commence a duty and ends</p>	

when that person is free of all duties, including post- flight duty;	← (11) post-flight duties incorporated.
(12) "FLIGHT DUTY PERIOD (FDP)" means a period that commences when a crew member is required to report for duty, which includes a sector or a series of sectors, and finishes when the aircraft finally comes to rest and the engines are shut down, at the end of the last sector on which the crew member acts as an operating crew member;	<p><b>FAQ – ORO.FTL.105 (12)</b></p> <hr/> <p><i>Duty immediately prior to a flight duty counts as part of the flight duty; duty immediately after a flight duty counts as duty period but not as flight duty.</i></p>
(13) "FLIGHT TIME" means, for aeroplanes and touring motor gliders, the time between an aircraft first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are shut down;	
(14) "HOME BASE" means the location, assigned by the operator to the crew member, from where the crew member normally starts and ends a duty period or a series of duty periods and where, under normal circumstances, the operator is not responsible for the accommodation of the crew member concerned;	
(15) "LOCAL DAY" means a 24-hour period commencing at 00:00 local time;	
(16) "LOCAL NIGHT" means a period of 8 hours falling between 22:00 and 08:00 local time;	
<p>(17) "OPERATING CREW MEMBER" means a crew member carrying out duties in an aircraft during a sector;</p> <p>GM1 ORO.FTL.105 (17) OPERATING CREW MEMBER</p> <p>A person on board an aircraft is either a crewmember or a passenger. If a crewmember is not a passenger on board an aircraft, he/she should be considered as 'carrying out duties'. The crewmember remains an operating crewmember during in-flight rest. In-flight rest counts in full as FDP, and for the purpose of ORO.FTL.210.</p>	
<p>(18) "POSITIONING" means the transferring of a non-operating crew member from one place to another, at the behest of the operator, excluding:</p> <ul style="list-style-type: none"> <li>• the time of travel from a private place of rest to the designated reporting place at home base and vice versa, and</li> <li>• the time for local transfer from a place of rest to the commencement of duty and vice versa;</li> </ul>	<p><b>FAQ – ORO.FTL.105 (18)</b></p> <hr/> <p><i>Any transfer of a crew member at the behest of the operator must be considered as positioning; thus "duty travel" is regarded the same as "positioning, dead heading..."</i></p> <p><b>NOTE:</b></p> <hr/> <p>Since the magnitude of a "local transfer" is not further defined GM1 CS FTL.1.200 could alternatively be used as an indication that no local transfer should exceed 90 minutes in either direction. Notwithstanding the extension of a rest period according to AMC ORO FTL.235 (b) applies.</p>

(19) <b>"REST FACILITY"</b> means a bunk or seat with leg and foot support suitable for crew members' sleeping on board an aircraft;	
(20) <b>"RESERVE"</b> means a period of time during which a crew member is required by the operator to be available to receive an assignment for an FDP, positioning or other duty notified at least 10 hours in advance;	
(21) <b>"REST PERIOD"</b> means a continuous, uninterrupted and defined period of time, following duty or prior to duty, during which a crew member is free of all duties, standby and reserve;	
(22) <b>"ROTATION"</b> is a duty or a series of duties, including at least one flight duty, and rest periods out of home base, starting at home base and ending when returning to home base for a rest period where the operator is no longer responsible for the accommodation of the crew member;	<p><b>BASICS (rotation)</b></p> <hr/> <p>A series of flights returning to home base without a rest period is considered <b>not</b> to be a rotation.</p>
(23) <b>"SINGLE DAY FREE OF DUTY"</b> means, for the purpose of complying with the provisions of Council Directive 2000/79/EC, a time free of all duties and standby consisting of one day and two local nights, which is notified in advance. A rest period may be included as part of the single day free of duty;	<p><b>BASICS (single day vs. local days)</b></p> <hr/> <p>For the application of a local day according to CD 2000/79/EC the definition of a local day according to ORO.FTL 105 (15) should be used. Thus, for rostering a duty period succeeding a "single day free of duty" a buffer of at least 6 hours must be observed; i.e. the duty may not commence prior 06:00 LT or the earliest possible end of the 2nd local night.</p> <p>It shall be noted that the local days free of all duties must be indicated in the roster.</p> <p>It should also be noted, that it could be questioned whether a "single day free of all duties" must be given at home base. Under EU law it is quite challenging to find arguments, why a link-up with the home base should be seen as a social standard. No explicit statement can be found unless regulated under national law (e.g. GERMANY → §8 Abs. (3) 1. DV LuftBO)</p>
(24) <b>"SECTOR"</b> means the segment of an FDP between an aircraft first moving for the purpose of taking off until it comes to rest after landing on the designated parking position;	
(25) <b>"STANDBY"</b> means a pre-notified and defined period of time during which a crew member is required by the operator to be available to receive an assignment for a flight, positioning or other duty without an intervening rest period;	
(26) <b>"AIRPORT STANDBY"</b> means a standby performed at the airport;	
(27) <b>"OTHER STANDBY"</b> means a standby either at home or in a suitable accommodation;	



(28) "WINDOW OF CIRCADIAN LOW (WOCL)" means the period between 02:00 and 05:59 hours in the time zone to which a crew member is acclimatised.

**ORO.FTL.110 Operator Responsibilities**



**An operator shall...**

AMC1 ORO.FTL.110

**SCHEDULING**

(a) Scheduling has an important impact on a crewmember's ability to sleep and to maintain a proper level of alertness. When developing a workable roster, the operator should strike a fair balance between the commercial needs and the capacity of individual crewmembers to work effectively. Rosters should be developed in such a way that they distribute the amount of work evenly among those that are involved.

(b) Schedules should allow for flights to be completed within the maximum permitted flight duty period and flight rosters should take into account the time needed for pre-flight duties, taxiing, the flight- and turnaround times. Other factors to be considered when planning duty periods should include:

(1) The allocation of work patterns which avoid undesirable practices such as alternating day/night duties, alternating eastward-westward or westward-eastward time zone transitions, positioning of crew members so that a serious disruption of established sleep/work patterns occurs;

(2) Scheduling sufficient rest periods especially after long flights crossing many time zones; and

(3) Preparation of duty rosters sufficiently in advance with planning of recurrent extended recovery rest periods and notification of the crewmembers well in advance to plan adequate pre-duty rest.

(a) publish duty rosters sufficiently in advance to provide the opportunity for crew members to plan adequate rest;

AMC1 ORO.FTL.110 (a)  
ROSTERS

**PUBLICATION OF ROSTERS**

Rosters should be published 14 days in advance.

(b) ensure that flight duty periods are planned in a way that enables crew members to remain sufficiently free from

← (AMC (a)) indicates that an operator should have some kind of tool established to strive for a distribution of days of during a significant period of time (calendar year?) as evenly as possible among crew members of equal occupation.

**FAQ – ORO.FTL.110(a)**

*A rest period may be re-planned provided that re-planning of rest (and duty) is completed and notified before the rest period has started and the re-planning practices do not conflict with a crew member's opportunity to plan adequate rest. ORO.FTL.110(a) instructs the operator to publish duty rosters sufficiently in advance to provide the opportunity for crew members to plan adequate rest. ORO.FTL.105(21) states that 'rest period' means a continuous, uninterrupted and defined period of time, following duty or prior to a duty, during which a crew member is free of all duties, standby and reserve.*

*An operator's procedures for re-planning should demonstrably describe by which means the opportunity for crew members to plan adequate rest is provided in the case of re-planning.*

*If re-planning takes place during the recurrent extended recovery rest period, a full uninterrupted rest period of 36 hours including 2 local nights must be respected after the interruption.*

**FAQ – ORO.FTL.110(c)**

*Reporting times must comply with ORO.FTL.110(c) and ORO.FTL.205(a)(l). The maximum FDP is restricted by the crew member who has reported first. The minimum reporting times, which have been defined by the operator in the operations manual for specific types of operations, shall always apply.*

**FAQ – ORO.FTL.110(a)**

*For published rosters, additional elements might be needed to enable an appropriate planning of individual fatigue management for crew members depending on the type of operation. Operators must demonstrate that their system fulfils the requirements of ORO.FTL.110(a). There is no IR that forbids the communication of changes to a published roster. On the other hand, all other rules, i.e. those concerning rest before an FDP, need to be observed.*

← (a) A continuous "ad hoc" scheduling over days and weeks as frequently practiced in business aviation is prohibited.

fatigue so that they can operate to a satisfactory level of safety under all circumstances;

(c) specify reporting times that allow sufficient time for ground duties;

(d) take into account the relationship between the frequency and pattern of flight duty periods and rest periods and give consideration to the cumulative effects of undertaking long duty hours combined with minimum rest periods;

(e) allocate duty patterns which avoid practices that cause a serious disruption of an established sleep/work pattern, such as alternating day/night duties;

(f) comply with the provisions concerning disruptive schedules in accordance with ARO.OPS.230;

(g) provide rest periods of sufficient time to enable crew members to overcome the effects of the previous duties and to be rested by the start of the following flight duty period;

(h) plan recurrent extended recovery rest periods and notify crew members sufficiently in advance;

(i) plan flight duties in order to be completed within the allowable flight duty period taking into account the time necessary for pre-flight duties, the sector and turnaround times;

(j) change a schedule and/or crew arrangements if the actual operation exceeds the maximum flight duty period on more than 33% of the flight duties in that schedule during a scheduled seasonal period.

AMC1 ORO.FTL.110 (j)

#### OPERATIONAL ROBUSTNESS OF ROSTERS

The operator should establish and monitor performance indicators for operational robustness of rosters.

#### BASICS (reporting time)

reporting times may be different, as long as they comply with ORO.FTL.110(c) and ORO.FTL.205(a)(1). The minimum reporting times, which have been defined by the operator in the operations manual for specific types of operations, shall always apply. In principal, the crew is restricted by the maximum FDP of the crew member with the most restricting combination of reporting time and maximum FDP.

Should a CM report late (...for example when called out of standby or due any other delay) the planned and unchanged reporting time for that rotation may be used especially when the individual time at which the CM finally reports for duty would result in a more restrictive FDP limit. This does not apply for a CM who would join a crew at a different individually planned reporting time.

#### COMMISSION REGULATION (EU) No 83/2014

In Annex II to Regulation (EU) No 965/2012, the following points ARO.OPS.230 and ARO.OPS.235 are added:

#### ARO.OPS.230 Determination of disruptive schedules

For the purpose of flight time limitations, the competent authority shall determine, in accordance with the definitions of "early type" and "late type" of disruptive schedules in point ORO.FTL.105 of Annex III, which of those two types of disruptive schedules shall apply to all CAT operators under its oversight.

→ ORO.FTL.105 Definitions (8) "disruptive schedule"


← (j) **In all consequences...** a change to the scheduling needs to be made only once **33%** of all flights of a particular pairing were operated **under commander's discretion!!!**

#### FAQ – ORO.FTL.110(j)

*AMC1 ORO.FTL.110(j) instructs the operator to establish and monitor performance indicators for operational robustness of rosters.*

*GM1 ORO.FTL.110(j) explains the purpose of the rule and specifies what those performance indicators should at least measure.*

<p>GM1 ORO.FTL.110 (j)  <b>OPERATIONAL ROBUSTNESS OF ROSTERS</b></p> <p>Performance indicators for operational robustness of rosters should support the operator in the assessment of the stability of its rostering system. Performance indicators for operational robustness of rosters should at least measure how often a rostered crew pairing for a duty period is achieved within the planned duration of that duty period. Crew pairing means rostered positioning and flights for crewmembers in one duty period.</p>	<p>← GM1 (j) Statistics on “on time” departure is obviously insufficient for an assessment of roster stability – only statistics on “on time” arrival of the final sector of a series of flights may indicate roster stability.</p>
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<b>ORO.FTL.115 Crew Member Responsibilities</b>	<b>Crewmembers shall...</b>
<p>(a) ...comply with point CAT.GEN.MPA.100(b) of Annex IV (Part-CAT); and</p> <p>(b) ...make optimum use of the opportunities and facilities for rest provided and plan and use their rest periods properly.</p> <p><b>FAQ – ORO.FTL.115 / 210 /235</b></p> <p>Crew members shall not simply enjoy provisions for rest and the opportunity to plan ahead but focus on their responsibility to reduce fatigue.</p> <p>Generally speaking, any professional activity must be known to the operator planning rest and duty to be able to meet his responsibilities in regards to avoid fatigue and accumulated fatigue.</p> <p>For further details in regards to the provision of data see NCC.GEN.105(f)(2)</p> 	<p>→ CAT.GEN.MPA.100 Crew responsibilities</p> <p>...</p> <p>(b) The crew member shall:</p> <p>(1) report to the commander any fault, failure, malfunction or defect which the crew member believes may affect the airworthiness or safe operation of the aircraft including emergency systems, if not already reported by another crew member;</p> <p>(2) report to the commander any incident that endangered, or could have endangered, the safety of the operation, if not already reported by another crew member;</p> <p>(3) comply with the relevant requirements of the operator’s occurrence reporting schemes;</p> <p>(4) <b>comply with all flight and duty time limitations (FTL) and rest requirements applicable to their activities;</b></p> <p>(5) when undertaking duties for more than one operator:</p> <p>(i) maintain his/her individual records regarding flight and duty times and rest periods as referred to in applicable FTL requirements; and</p> <p>(ii) provide each operator with the data needed to schedule activities in accordance with the applicable FTL requirements.</p> <p>AMC1 CAT.GEN.MPA.100 (b) Crew responsibilities  <b>COPIES OF REPORTS</b></p> <p>Where a written report is required, a copy of the report should be communicated to the commander concerned, unless the terms of the operator’s reporting schemes prevent this.</p>

<b>ORO.FTL.120 Fatigue Risk Management (FRM)</b>	
<p>(a) <b>When FRM is required</b> by this Subpart or an applicable certification specification, the operator shall establish, implement and maintain a FRM as an integral part of its management system. The FRM shall ensure compliance with the essential requirements in points 7.f, 7.g and 8.f of Annex IV to Regulation (EC) No. 216/2008. The FRM shall be described in the</p>	<p><b>Different forms of FRM need to be applied for the following options:</b></p>

operations manual.

(b) The FRM established, implemented and maintained shall provide for **continuous improvement to the overall performance** of the FRM and shall include:

(1) a description of the philosophy and principles of the operator with regard to FRM, referred to as the **FRM policy**;

AMC1 ORO.FTL.120 (b)(1) CAT OPERATORS' FRM POLICY

(a) The operator's FRM policy should identify all the elements of FRM.

(b) The FRM policy should define to which operations FRM applies.

(c) The FRM policy should:

(1) reflect the shared responsibility of management, flight and cabin crew, and other involved personnel;

(2) state the safety objectives of FRM;

(3) be signed by the accountable manager;

(4) be communicated, with visible endorsement, to all the relevant areas and levels of the organisation;

(5) declare management commitment to effective safety reporting;

(6) declare management commitment to the provision of adequate resources for FRM;

(7) declare management commitment to continuous improvement of FRM;

(8) require that clear lines of accountability for management, flight and cabin crew, and all other involved personnel are identified; and

(9) require periodic reviews to ensure it remains relevant and appropriate.

(2) **documentation** of the FRM processes, including a process for making personnel aware of their responsibilities and the procedure for amending this documentation;

AMC2 ORO.FTL.120 (b)(2) CAT OPERATORS' FRM POLICY

The operator should develop and keep current FRM documentation that describes and records:

(a) FRM policy and objectives;

(b) FRM processes and procedures;

(c) accountabilities, responsibilities and authorities for these processes and procedures;

(d) mechanisms for on-going involvement of management, flight and cabin crew members, and all other involved personnel;

(e) FRM training programmes, training requirements and attendance records;

(f) scheduled and actual flight times, duty periods and rest periods with deviations and reasons for deviations; and

(g) FRM outputs including findings from collected data, recommendations, and actions taken.

(3) **scientific principles** and knowledge;

GM1 ORO.FTL.120 Fatigue risk management (FRM)

ICAO DOC 9966 — MANUAL FOR THE OVERSIGHT OF FATIGUE MANAGEMENT APPROACHES

#### Established FRM...

...Flight Time Specification Schemes which deviate from any IR or CS as provided

ORO.FTL.125 (d)

...FDP limit (unknown state of accl.)

ORO.FTL.205 (b)

...Reduced rest at home base

CS.FTL.1.235 (c)

#### Appropriate FRM...

Night Duties of more than 10 hrs. CS FTL.1.205 (b)

#### Principles of FRM...

...8-hour sleep opportunity (Reserve)

CS.FTL.1.230

(ICAO – IATA – IFALPA) Fatigue Management Guide for Airline Operators 2nd Ed (2015)

ICAO Doc 9966 - FRMS Manual for Regulators

#### Basics (Crew Member)

Cross-reference → (EC) No. 216/2008

Annex IV

#### 7. Crew members

...

7.f. No crew member must allow their task achievement/decision making to deteriorate to the extent that flight safety is endangered because of the effects of fatigue, taking into account, inter alia, fatigue accumulation, sleep deprivation, number of sectors flown, night duties or time zone changes. Rest periods must provide sufficient time to enable crew members to overcome the effects of the previous duties and

Further guidance on FRM processes, appropriate fatigue management, the underlying scientific principles and operational knowledge may be found in ICAO Doc 9966 (Manual for the Oversight of Fatigue Management Approaches).

GM1 ORO.FTL.120(b)(3) Fatigue risk management (FRM)

SCIENTIFIC METHOD

... is defined as a method or procedure that has characterized natural science since the 17th century, consisting in systematic observation, measurement, and experiment, and the formulation, testing, and modification of hypotheses. A scientific study may be required as an element of proactive fatigue hazard identification. Such a study should be based on scientific principles, i.e. use the scientific method. That means that the study should consist of the following elements as applicable to each individual case:

- (a) an introduction with a summary and the description of the study design, methods and results;
- (b) a statement of the hypothesis being tested, how it is being tested and a conclusion as to whether the hypothesis was found to be true or not;
- (c) a description of the data collection method and tools, e.g. the sensitivity of the activity monitors, further information on any model and its limitations and how it is being used as part of the study;
- (d) a description of how the study subjects were selected and how representative of the crew member population the study group is;
- (e) a description of the rosters the study participants have worked containing data such as e.g. flight and duty hours, number of sectors, duty start/finish times;
- (f) reports on mean sleep duration and efficiency and data for other standard measures (e.g. sleep timing, self-rated sleepiness/fatigue, sources of sleep disruption, performance, safety);
- (g) a description of how sleep and the other measures varied across the roster (i.e. day-to-day) and where and why minimum sleep occurred;
- (h) statistical data analysis to test the hypothesis; and
- (i) the explanation of how the study results have been used to influence the design of the roster or other fatigue mitigations.

(4) **A hazard identification and risk assessment** process that allows managing the operational risk(s) of the operator arising from crew member fatigue on a continuous basis;

AMC1 ORO.FTL.120 (b)(4)

COMMERCIAL AIR TRANSPORT OPERATORS' IDENTIFICATION OF HAZARDS

The operator should develop and maintain three documented processes for fatigue hazard identification:

(a) Predictive

- (1) The predictive process should identify fatigue hazards by examining crew scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include, but are not limited to:
- (2) operator or industry operational experience and data collected on similar types of operations;
- (3) evidence-based scheduling practices; and
- (4) bio-mathematical models.

(b) Proactive

The proactive process should identify fatigue hazards within current flight operations. Methods of examination may include, but are not limited to:

- (1) self-reporting of fatigue risks;
- (2) crew fatigue surveys;
- (3) relevant flight and cabin crew performance data;
- (4) available safety databases and scientific studies; and
- (5) analysis of planned versus actual time worked.

(c) Reactive

The reactive process should identify the contribution of fatigue hazards to reports and events associated with potential negative

*to be well rested by the start of the following flight duty period.*

*7.g. A crew member must not perform allocated duties on board an aircraft when under the influence of psychoactive substances or alcohol or when unfit due to injury, fatigue, medication, sickness or other similar causes.*

...

*8.f. The prevention of fatigue must be managed through a rostering system. For a flight, or series of flights, such a rostering system needs to address flight time, flight-duty periods, duty and adapted rest periods. Limitations established within the rostering system must take into account all relevant factors contributing to fatigue such as, in particular, number of sectors flown, time-zone crossing, sleep deprivation, disruption of circadian cycles, night hours, positioning, cumulative duty time for given periods of time, sharing of allocated tasks between crew members, and also the provision of augmented crews.*

...

*(7.g) Crew Members must be fit to fly... Fatigue can be a cause to be... "unfit to fly"*

...

*(8.f) Scientific findings show specific rest demand after time zone crossing but still also a strong individual effect for different crew members.*

*It might be advisable to provide different rest patterns on similar routes.*

*Should an operator service several routes from Europe to the Far East it could be helpful to offer shorter layovers (single night return) on one route where as a*

safety consequences in order to determine how the impact of fatigue could have been minimized. At a minimum, the process may be triggered by any of the following:

- (1) fatigue reports;
- (2) confidential reports;
- (3) audit reports;
- (4) incidents; or
- (5) flight data monitoring (FDM) events.

AMC2 ORO.FTL.120(b)(4)

#### COMMERCIAL AIR TRANSPORT OPERATORS' RISK ASSESSMENT

An operator should develop and implement risk assessment procedures that determine the probability and potential severity of fatigue-related events and identify when the associated risks require mitigation. The risk assessment procedures should review identified hazards and link them to:

- (a) operational processes;
- (b) their probability;
- (c) possible consequences; and
- (d) the effectiveness of existing safety barriers and controls.

(5) a **risk mitigation** process that provides for remedial actions to be implemented promptly, which are necessary to effectively mitigate the operator's risk(s) arising from crew member fatigue and for continuous monitoring and regular assessment of the mitigation of fatigue risks achieved by such actions;

AMC1 ORO.FTL.120 (b)(5)

#### CAT OPERATORS' RISK MITIGATION

An operator should develop and implement risk mitigation procedures that:

- (a) select the appropriate mitigation strategies;
- (b) implement the mitigation strategies; and
- (c) monitor the strategies' implementation and effectiveness.

(6) **FRM safety assurance** processes;

AMC1 ORO.FTL.120 (b)(6)

#### COMMERCIAL AIR TRANSPORT OPERATORS' FRM SAFETY ASSURANCE PROCESSES

The operator should develop and maintain FRM safety assurance processes to:

(a) provide for continuous FRM performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:

- (1) hazard reporting and investigations;
- (2) audits and surveys; and
- (3) reviews and fatigue studies;

(b) provide a formal process for the management of change which should include, but is not limited to:

- (1) identification of changes in the operational environment that may affect FRM;
- (2) identification of changes within the organisation that may affect FRM; and
- (3) consideration of available tools which could be used to maintain or improve FRM performance prior to implementing changes;

longer layover is provided on a similar one (similar in terms of departure time and time zone crossing) and offer the crew members to choose a preference.

#### Basics (Operations Manual)

Cross-reference → ORO.MLR

AMC3 ORO.MLR.100 Operations manual — general

#### CONTENTS — CAT OPERATIONS

(a) The OM should contain at least the following information, where applicable, as

<p>and</p> <p>(c) provide for the continuous improvement of FRM. This should include, but is not limited to:</p> <p>(1) the elimination and/or modification of risk controls have had unintended consequences or that are no longer needed due to changes in the operational or organisational environment;</p> <p>(2) routine evaluations of facilities, equipment, documentation and procedures; and</p> <p>(3) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.</p> <p><b>(7) FRM promotion processes.</b></p> <p>AMC<sub>1</sub> ORO.FTL.120 (b)(7) <span style="float: right;">COMMERCIAL AIR TRANSPORT OPERATORS' FRM PROMOTION PROCESS</span></p> <p>FRM promotion processes should support the on-going development of FRM, the continuous improvement of its overall performance, and attainment of optimum safety levels.</p> <p>The following should be established and implemented by the operator as part of its FRM:</p> <p>(a) training programmes to ensure competency commensurate with the roles and responsibilities of management, flight and cabin crew, and all other involved personnel under the planned FRM; and</p> <p>(b) an effective FRM communication plan that:</p> <p>(1) explains FRM policies, procedures and responsibilities to all relevant stakeholders; and</p> <p>(2) describes communication channels used to gather and disseminate FRM- related information</p> <p>(c) The <b>FRM shall correspond</b> to the flight time specification scheme, the size of the operator and the nature and complexity of its activities, taking into account the hazards and associated risks inherent in those activities and the applicable flight time specification scheme.</p> <p>(a) (d) The operator shall take <b>mitigating actions</b> when the FRM safety assurance process shows that the required safety performance is not maintained.</p>	<p>relevant for the area and type of operation: (...)</p> <p>7 FLIGHT TIME LIMITATION</p> <p>7.1 Flight and duty time limitations and rest requirements.</p> <p>7.2 Exceedance of flight and duty time limitations and/or reductions of rest periods. Conditions under which flight and duty time may be exceeded or rest periods may be reduced, and the procedures used to report these modifications.</p> <p>7.3 A description of the fatigue risk management, including at least the following: the philosophy and principles; documentation of processes; scientific principles and knowledge; hazard identification and risk assessment processes;</p>
<p><b>ORO.FTL.125 Flight Time Specification Schemes</b></p>	
<p>(a) Operators shall establish, implement and maintain flight time specification schemes that are appropriate for the type(s) of operation performed and that comply with Regulation (EC) No. 216/2008, this Subpart and other applicable legislation, including Directive 2000/79/EC.</p> <p>(b) Before being implemented, flight time specification schemes, including any related FRM where required, shall be approved by the competent authority.</p> <p>(c) To demonstrate compliance with Regulation (EC) No. 216/2008 and this Subpart, the operator shall apply the applicable certification specifications adopted by the Agency. Alternatively, if the operator wants to deviate from those certification specifications in accordance with Article 22(2) of Regulation (EC) No. 216/2008, it shall provide the competent authority with a full description of the intended deviation prior to implementing it. The description shall include any revisions to manuals or procedures that may be relevant, as well as an assessment</p>	<p><b>Directive 2000/79/EC</b></p> <p>...</p> <p>Clause 8</p> <p>1. Working time should be looked at without prejudice to any future Community legislation on flight and duty time limitations and rest requirements and in conjunction with national legislation on this subject which should be taken into consideration in all related matters.</p> <p>2. The maximum annual working time, including some elements of standby for duty assignment as determined by the applicable law, shall be 2 000 hours in which the block flying time shall be limited to 900 hours.</p> <p>3. The maximum annual working time shall be spread as evenly as practicable throughout the year.</p>



demonstrating that the requirements of Regulation (EC) No. 216/2008 and of this Subpart are met.

(d) For the purpose of point ARO.OPS.235 (d), within 2 years of the implementation of a deviation or derogation, the operator shall collect data concerning the granted deviation or derogation and analyse that data using scientific principles with a view to assessing the effects of the deviation or derogation on aircrew fatigue. Such analysis shall be provided in the form of a report to the competent authority.

Clause 9  
Without prejudice to Clause 3, mobile staff in civil aviation shall be given days free of all duty and standby, which are notified in advance, as follows:

(a) at least seven local days in each calendar month, which may include any rest periods required by law; and

(b) at least 96 local days in each calendar year, which may include any rest periods required by law.

**ORO.FTL.200 Home Base**

An operator shall assign a home base to each crew member.

**CS FTL.1.200 Home Base**

(a) The home base is a single airport location assigned with a high degree of permanence.

(b) In the case of a change of home base, the first recurrent extended recovery rest period prior to starting duty at the new home base is increased to 72 hours, including 3 local nights. Travelling time between the former home base and the new home base is positioning.

**FAQ – ORO.FTL.1.200**

*Any crew member has only one home base at a time which is equivalent to one airport.*

*Any departure from another airport is either part of a roster that started at the home base or CS FTL.1.200 has to be observed.*

GM1 CS FTL.1.200 TRAVELLING TIME

Crew members should consider making arrangements for temporary accommodation closer to their home base if the travelling time from their residence to their home base usually exceeds 90 minutes.

**ORO.FTL.205 Flight Duty Period (FDP)**

**(a) The operator shall:**

(1) define reporting times appropriate to each individual operation taking into account ORO.FTL.110 (c);

GM1 ORO.FTL.205(a)(1) REPORTING TIMES

The operator should specify reporting times taking into account the type of operation, the size and type of aircraft and the reporting airport conditions.

(2) establish procedures specifying how the commander shall, in case of special circumstances which could lead to severe fatigue, and after consultation with the crew members concerned, reduce the actual FDP and/or increase the rest period in order to eliminate any detrimental effect on flight safety.

Table 2  
Maximum daily FDP – acclimatised crewmembers

Start of FDT at reference time	Sectors								
	1 - 2	3	4	5	6	7	8	9	
06:00 - 13:29	13:00	12:30	12:00	11:30	11:00	10:30	10:00	09:30	
13:30 - 13:59	12:45	12:15	11:45	11:15	10:45	10:15	09:45	09:15	
14:00 - 14:29	12:30	12:00	11:30	11:00	10:30	10:00	09:30		
14:30 - 14:59	12:15	11:45	11:15	10:45	10:15	09:45	09:15		
15:00 - 15:29	12:00	11:30	1:00	10:30	10:00	09:30			
15:30 - 15:59	11:45	11:15	10:45	10:15	09:45	09:15			

**(b) Basic maximum daily FDP:**

(1) The maximum daily FDP without the use of extensions for acclimatised crew members shall be in accordance with the following table: (...see next column → Table 2)

GM1 ORO.FTL.205 (b)(1)

**REFERENCE TIME**

The start time of the FDP in the table refers to the 'reference time'. That means, to the local time of the point of departure, if this point of departure is within a 2-hour wide time zone band around the local time where a crew member is acclimatised.

(2) The maximum daily FDP when crew members are in an unknown state of acclimatisation shall be in accordance with the following table: (...see next column → Table 3)

(3) The maximum daily FDP when crew members are in an unknown state of acclimatisation and the operator has **implemented a FRM**, shall be in accordance with the following table: (...see next column → Table 4)

16:00 - 16:29	11:30	11:00	10:30	10:00	09:30	09:00		
16:30 - 16:59	11:15	10:45	10:15	09:45	09:15			
17:00 - 04:59	11:00	10:30	10:00	09:30	09:00	09:15		
05:00 - 05:14	12:00	11:30	11:00	10:30	10:00			
05:15 - 05:29	12:15	11:45	11:15	10:45	10:15	09:30		
05:30 - 05:44	12:30	12:00	11:30	11:00	10:30	10:00	09:30	
05:45 - 05:59	12:45	12:15	11:45	11:15	10:45	10:15	09:45	09:15

Table 3  
Crewmembers in an unknown state of acclimatisation

Maximum daily FDP according to sectors						
1 - 2	3	4	5	6	7	
11:00	10:30	10:00	09:30	09:00		

Table 4 - Crewmembers in an unknown state of acclimatisation under **FRM**

**FRM** – The values in the following table may apply provided the operator’s FRM continuously monitors that the required safety performance is maintained.

Maximum daily FDP according to sectors						
1 - 2	3	4	5	6	7	
12:00	11:30	11:00	10:30	10:00	09:30	

**FAQ – ORO.FTL.205(b)(3)**

*The 1-hour step from Table 3 to Table 4 is only allowed under FRM which next to the general tasks of an FRM(S) explicitly analyses data for each route (i.e. city pairing, type of A/C, daytime of schedule, crew complement, rotation, rostering) for the purpose of risk mitigation and fatigue avoidance.*

**(c) FDP with different reporting time for flight crew and cabin crew:**

Whenever cabin crew requires more time than the flight crew for their pre-flight briefing for the same sector or series of sectors, the FDP of the cabin crew may be extended by the difference in reporting time between the cabin crew and the flight crew. The difference shall not exceed 1 hour. The maximum daily FDP for cabin crew shall be based on the time at which the flight crew report for their FDP, but the FDP shall start at the reporting time of the cabin crew.

**(d) Maximum daily FDP for acclimatised crew members with the use of extensions without in-flight rest:**

- (1) The maximum daily FDP may be extended by up to 1 hour not more than twice in any 7 consecutive days. In that case:
  - (i) the minimum pre-flight and post-flight rest periods shall be increased by 2 hours;

**FAQ – ORO.FTL.205 (d)**

**CLARIFICATION REQUIRED ...**

**“twice in any consecutive days”** – wording is ambiguous: Which event triggers the use of an extension or “To which day does an extension have to be counted?” → The day of reporting for an extended FDP (i.e. reporting)?

According to (d)(3) an extension does not need to be published; however, an operator must enable his crew members to plan adequate rest.

**Note:** The above statement given in the FAQs needs further clarification since it is obvious that a crew member needs to know whenever an extended FDP is

or

(ii) the post-flight rest period shall be increased by 4 hours.

(2) When extensions are used for consecutive FDPs, the additional pre- and post-flight rest between the two extended FDPs required under subparagraph 1 shall be provided consecutively.

(3) The use of the extension shall be planned in advance, and shall be limited to a maximum of:

(i) 5 sectors when the WOCL is not encroached; or

(ii) 4 sectors, when the WOCL is encroached by 2 hours or less; or

(iii) 2 sectors, when the WOCL is encroached by more than 2 hours.

(4) Extension of the maximum basic daily FDP without in-flight rest shall not be combined with extensions due to in-flight rest or split duty in the same duty period.

(5) Flight time specification schemes shall specify the limits for extensions of the maximum basic daily FDP in accordance with the certification specifications applicable to the type of operation, taking into account:

(i) the number of sectors flown; and

(ii) WOCL encroachment.

#### **(e) Maximum daily FDP with the use of extensions due to in-flight rest**

Flight time specification schemes shall specify the conditions for extensions of the maximum basic daily FDP with in-flight rest in accordance with the certification specifications applicable to the type of operation, taking into account:

(i) the number of sectors flown;

(ii) the minimum in-flight rest allocated to each crew member;

(iii) the type of in-flight rest facilities; and

(iv) the augmentation of the basic flight crew.

#### **(f) Unforeseen circumstances in flight operations — commander's discretion**

(1) The conditions to modify the limits on flight duty, duty and rest periods by the commander in the case of unforeseen circumstances in flight operations, which start at or after the reporting time, shall comply with the following:

(i) the maximum daily FDP which results after applying points (b) and (e) of point ORO.FTL.205 or point ORO.FTL.220 may not be increased by more than 2 hours unless the flight crew has been augmented, in which case the maximum flight duty period may be increased by not more than 3 hours;

GM1 ORO.FTL.205 (f)(1)(i)

COMMANDER'S DISCRETION

*planned to verify that all limitations associated to an extension are met.*

An operator who foresees increased roster instability may add an extension as a buffer; in this case, all rest requirements must be rostered. During actual operation, the FDP may be re-planned as a standard limit and does not count towards the 2-in-7 limit. Due to the operator's responsibility to pre-plan rest, the already planned additional rest provisions may not be altered to waive any detrimental impact on the crew member's ability to plan adequate rest.

#### **FAQ – ORO.FTL.205(d)+(e)**

*There is neither a restriction on the number of extensions due to in-flight rest within any specific time frame nor a restriction on the combination with an extended FDP according to ORO.FTL.205 (d)*

←(3) According to the FAQs the extension must not be published in the roster but pre-planning is required. For the purpose of clarity, it should be published anyway since already the planned use of an extension triggers additional rest.

← (5) NOTE: CS.FTL.1.205(b) ... shall be understood as the application of ORO.FTL.205 (d)(5) under the aspect of safety mitigation.

#### **BASICS (Commander's Discretion)**

"Commander's discretion (CD)" provides an opportunity to extend an actual FDP beyond the applicable maximum allowable FDP limit. It does not apply to the duration of a planned FDP as published in a roster; i.e. due to unforeseen circumstances a planned FDP may be extended up to the max. allowable FDP without any "CD".

However, "CD" may provide much less flexibility than anticipated. "CD" applies to the basic FDP limits. Further, during actual operation, an extra sector may already shorten the length of the previously planned maximum FDP. The resulting limit could be as little as 30 minutes above the originally planned FDP limit. That is, when the initial planning was done according to ORO.FTL.205 (d).

ORO.FTL.205 (f)(i) refers to an FDP after applying points (b) or (e) - thus it excludes point (d); i.e. the one-hour extension. This means, that an FDP extended

The maximum basic daily FDP that results after applying ORO.FTL.205 (b) should be used to calculate the limits of commander's discretion, if commander's discretion is applied to an FDP which has been extended under the provisions of ORO.FTL.205 (d).

(ii) if on the final sector within an FDP the allowed increase is exceeded because of unforeseen circumstances after take-off, the flight may continue to the planned destination or alternate aerodrome; and

(iii) the rest period following the FDP may be reduced but can never be less than 10 hours.

(2) In case of unforeseen circumstances, which could lead to severe fatigue, the commander shall reduce the actual flight duty period and/or increase the rest period in order to eliminate any detrimental effect on flight safety.

(3) The commander shall consult all crew members on their alertness levels before deciding the modifications under subparagraphs 1 and 2.

(4) The commander shall submit a report to the operator when an FDP is increased or a rest period is reduced at his or her discretion.

(5) Where the increase of an FDP or reduction of a rest period exceeds 1 hour, a copy of the report, to which the operator shall add its comments, shall be sent by the operator to the competent authority not later than 28 days after the event

(6) The operator shall implement a non-punitive process for the use of the discretion described under this provision and shall describe it in the operations manual.

AMC1 ORO.FTL.205(f)

#### UNFORESEEN CIRCUMSTANCES IN ACTUAL FLIGHT OPERATIONS – COMMANDER'S DISCRETION

(a) As general guidance when developing a commander's discretion policy, the operator should take into consideration the shared responsibility of management, flight and cabin crew in the case of unforeseen circumstances. The exercise of commander's discretion should be considered exceptional and should be avoided at home base and/or company hubs where standby or reserve crew members should be available. Operators should assess on a regular basis the series of pairings where commander's discretion has been exercised in order to be aware of possible inconsistencies in their rostering.

(b) The operator's policy on commander's discretion should state the safety objectives, especially in the case of an extended FDP or reduced rest and should take due consideration of additional factors that might decrease a crew member's alertness levels, such as:

- (1) WOCL encroachment;
- (2) weather conditions;
- (3) complexity of the operation and/or airport environment;
- (4) aeroplane malfunctions or specifications;

according to point (d) may under "CD" only be extended by a maximum of one hour (i.e. as a basic FDP extended by max. 2 hours)

← see GM1 ORO.FTL.205 (f)(1)(i)

- (5) flight with training or supervisory duties;
- (6) increased number of sectors;
- (7) circadian disruption; and
- (8) individual conditions of affected crew members (time since awake, sleep-related factor, workload, etc.).

**(g) Unforeseen circumstances in flight operations — delayed reporting**

The operator shall establish procedures, in the operations manual, for delayed reporting in the event of unforeseen circumstances, in accordance with the certification specifications applicable to the type of operation.

**CS FTL.1.205 Flight Duty Period (FDP)**

**(a) Night duties under the provisions of ORO.FTL.205 (b) and (d) comply with the following:**

- (1) When establishing the maximum FDP for **consecutive night duties**, the number of sectors is limited to 4 sectors per duty.
- (2) The operator applies **appropriate fatigue risk management** to actively manage the fatiguing effect of night duties of more than 10 hours in relation to the surrounding duties and rest periods.

**GM1 CS FTL.1.205 (a)(2) NIGHT DUTIES – APPROPRIATE FATIGUE RISK MANAGEMENT**

(a) When rostering night duties of more than 10 hours (referred to below as 'long night duties'), it is critical for the crew member to obtain sufficient sleep before such duties when he/she is adapted to being awake during day time hours at the local time where he/she is acclimatised. To optimise alertness on long night duties, the likelihood of obtaining sleep as close as possible to the start of the FDP should be considered, when rostering rest periods before long night duties, by providing sufficient time to the crew member to adapt to being awake during the night. Rostering practices leading to extended wakefulness before reporting for such duties should be avoided. Fatigue risk management principles that could be applied to the rostering of long night duties may include:

- (1) avoiding long night duties after extended recovery rest periods
- (2) progressively delaying the rostered ending time of the FDPs preceding long night duties;
- (3) starting a block of night duties with a shorter FDP; and
- (4) avoiding the sequence of early starts and long night duties.

(b) Fatigue risk management principles may be applied to the rostering of long night duties by means of:

- (1) considering operator or industry operational experience and data collected on similar operations;
- (2) evidence-based scheduling practices; and
- (3) bio-mathematical models.

**(b) Extension of FDP without in-flight rest**

**BASICS (appropriate FRM)**

An approved FRM follows the request for a deviation from existing rules. In this line an operator is held to continuously prove that his operation meets the requirement for an equivalent level of safety as given by this regulation. Such a prove requires extensive preparation, analysis and organisational processes.

Long night duties beyond 10 hours however need mitigation measures which help to avoid undue levels of fatigue and a monitoring process to prove, that no undue level of fatigue is ever exceeded. Otherwise appropriate action needs to be taken.

Thus a flight oriented risk analysis, pairing oriented data acquisition, data analysis and finding oriented management processes should be implemented.

The scope of the processes should be in relation to the magnitude/complexity of the operation and identified potential risk.

← (GM1 CS FTL.1.205(a)(2))

**Maximum daily FDP with extension**

Start of FDT at reference time	Sectors			
	1 - 2	3	4	5
06:15 - 06:29	13:15	12:45	12:15	11:45
06:30 - 06:44	13:30	13:00	12:30	12:00
06:45 - 06:59	13:45	13:15	12:45	12:15
07:00 - 13:29	14:00	13:30	13:00	12:30

The extension of FDP without in-flight rest under the provisions of ORO.FTL.205 (d)(5) is limited to the values specified in the table below.

(...see next column → Maximum daily FDP with extension)

**(c) Extension of FDP due to in-flight rest**

In-flight rest facilities in accordance with ORO.FTL.205 (e)(iii) fulfil the following minimum standards:

➤ **'Class 1 rest facility'...**

means a bunk or other surface that allows for a flat or near flat sleeping position. It reclines to at least 80° back angle to the vertical and is located separately from both the flight crew compartment and the passenger cabin in an area that allows the crew member to control light, and provides isolation from noise and disturbance;

➤ **'Class 2 rest facility'...**

means a seat in an aircraft cabin that reclines at least 45° back angle to the vertical, has at least a pitch of 55 inches (137.5 cm), a seat width of at least 20 inches (50 cm) and provides leg and foot support. It is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or crew members;

➤ **'Class 3 rest facility'...**

means a seat in an aircraft cabin or flight crew compartment that reclines at least 40° from the vertical, provides leg and foot support and is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is not adjacent to any seat occupied by passengers.

(1) The extension of FDP with in-flight rest under the provisions of ORO.FTL.205 (e) complies with the following:

- (i) the FDP is limited to 3 sectors; and
- (ii) the minimum in-flight rest period is a consecutive 90-minute period for each crew member and 2 consecutive hours for the flight crew members at control during landing.

GM1 CS FTL.1.205(c)(1)(ii)

IN-FLIGHT REST

In-flight rest should be taken during the cruise phase of the flight.

GM2 CS FTL.1.205(c)(1)(ii)

IN-FLIGHT REST

In-flight rest periods should be allocated in order to optimise the alertness of those flight crew members at control during landing.

(2) The maximum daily FDP under the provisions of ORO.FTL.205 (e) may be extended due to in-flight rest for flight crew:

13:30 - 13:59	13:45	13:15	12:45
14:00 - 14:29	13:30	13:00	12:30
14:30 - 14:59	13:15	12:45	12:15
15:00 - 15:29	13:00	12:30	12:00
15:30 - 15:59	12:45		
16:00 - 16:29	12:30		
16:30 - 16:59	12:15		
17:00 - 17:29	12:00		
17:30 - 17:59	11:45		
18:00 - 18:29	11:30		
18:30 - 18:59	11:15		
19:00 - 06:14			

not allowed

**FAQ – CS.FTL.1.205(a)**

*Two night duties separated by anything but a single rest period (less than RECCrest) would not be considered “consecutive”.*

**FAQ – CS.FTL.1.205(a)(1)**

*An approved FRM according to ORO.FTL.120 is not required.*

**FAQ – CS.FTL.1.205(b)+(c)**

*The maximum duration of an FDP with augmented crew is established for the entire crew, not for individual crew members; the crew is considered a unit for the calculation of the maximum FDP.*

→ see also CS.FTL.1.205(c)(7)

**CLARIFICATION REQUIRED ...**

**FRM** – the scope of “appropriate FRM” which is required for night duties exceeding 10 hours needs to be determined. Even the guidance material foresees...

- > operational experience
- > evidence-based practices
- or
- > bio-mathematical models

(i) with <b>one</b> additional flight crew member:	(ii) with <b>two</b> additional flight crew members:
(A) up to 14 hours with class 3 rest facilities; (B) up to 15 hours with class 2 rest facilities; (C) up to 16 hours with class 1 rest facilities;	(A) up to 15 hours with class 3 rest facilities; (B) up to 16 hours with class 2 rest facilities; (C) up to 17 hours with class 1 rest facilities.

(3) The minimum in-flight rest for each cabin crew member is:  
(see next column → Min. in-flight rest for each cabin crew member)

(4) The limits specified in (2) may be increased by 1 hour for FDPs that include 1 sector of more than 9 hours of continuous flight time and a maximum of 2 sectors.

(5) All time spent in the rest facility is counted as FDP.

(6) The minimum rest at destination is at least as long as the preceding duty period, or 14 hours, whichever is greater.

(7) A crew member does not start a positioning sector to become part of this operating crew on the same flight.

**(d) Unforeseen circumstances in flight operations — delayed reporting**

(1) The operator may delay the reporting time in the event of unforeseen circumstances, if procedures for delayed reporting are established in the operations manual. The operator keeps records of delayed reporting. Delayed reporting procedures establish a notification time allowing a crew member to remain in his/her suitable accommodation when the delayed reporting procedure is activated. In such a case, if the crew member is informed of the delayed reporting time, the FDP is calculated as follows:

- (i) one notification of a delay leads to the calculation of the maximum FDP according to (iii) or (iv);
- (ii) if the reporting time is further amended, the FDP starts counting 1 hour after the second notification or at the original delayed reporting time if this is earlier;
- (iii) when the delay is less than 4 hours, the maximum FDP is calculated based on the original reporting time and the FDP starts counting at the delayed reporting time;
- (iv) when the delay is 4 hours or more, the maximum FDP is calculated based on the more limiting of the original or the delayed reporting time and the FDP starts counting at the delayed reporting time;
- (v) as an exception to (i) and (ii), when the operator informs the crew member of a delay of 10 hours or more in reporting time and the crew member is not further disturbed by the operator, such delay of 10 hours or more counts as a rest period.

GM1 CS FTL.1.205 (d) DELAYED REPORTING  
 Operator procedures for delayed reporting should:  
 (a) specify a contacting mode;

...rather as alternatives than as necessary supplemental methods and seems to see FRM principles as sufficient.

Min. in-flight rest for each **cabin crew member**

Maximum extended FDP	Minimum in-flight rest (in hours)		
	Class 1	Class 2	Class 3
...up to 14:30	1:30	1:30	1:30
14:31 - 15:00	1:45	2:00	2:20
15:01 - 15:30	2:00	2:20	2:40
15:31 - 16:00	2:15	2:40	3:00
16:01 - 16:30	2:35	3:00	Not allowed
16:31 - 17:00	3:00	3:25	
17:01 - 17:30	3:25	Not allowed	Not allowed
17:31 - 18:00	3:50		

**NOTE:**  
 As long as a flight is not operated under the provisions of CS.FTL 1.205 (c) the crew rest may still be used without observing the table above.

**FAQ – CS.FTL.205(d)(1)**  
*A delayed reporting time is the ‘new’ reporting time. A concrete reporting time must be given when the crew member is informed that the delayed reporting procedure is activated.*  
*Thus, an unspecific “...next INFO at” procedure is not allowed.*  
*Further, the general purpose of Standby is not designed to substitute “delayed reporting”.*

<p>(b) establish minimum and maximum notification times; and (c) avoid interference with sleeping patterns when possible.</p>	<p style="text-align: center;"><b>CLARIFICATION REQUIRED ...</b></p> <p><i>It should be clarified whether standby may be assigned out of delayed reporting.</i></p>
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**ORO.FTL.210 Flight Times and Duty Periods**

<p>(a) The <b>total duty periods</b> to which a crew member may be assigned shall not exceed:</p> <p>(1) 60 duty hours in any 7 consecutive days; (2) 110 duty hours in any 14 consecutive days; and (3) 190 duty hours in any 28 consecutive days, spread as evenly as practicable throughout that period.</p> <p>(b) The <b>total flight time</b> of the sectors on which an individual crew member is assigned as an operating crew member shall not exceed:</p> <p>(1) 100 hrs of flight time in any 28 consecutive days; (2) 900 hrs of flight time in any calendar year; and (3) 1.000 hrs of flight time in any 12 consecutive calendar months.</p> <p>(c) <b>Post-flight duty</b> shall count as duty period. The operator shall specify in its operations manual the minimum time period for post-flight duties.</p> <p>AMC1 ORO.FTL.210(c) <span style="float: right;">POST-FLIGHT DUTIES</span> The operator should specify post-flight duty times taking into account the type of operation, the size and type of aircraft and the airport conditions.</p>	<p>← (c) clarification that post-flight duties are not part of the FDP but part of the duty period.</p> <p>...see also ORO.FTL.110 (c) (Operators Responsibilities): ... (c) specify reporting times that allow sufficient time for ground duties;</p>
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**ORO.FTL.215 Positioning** **If an operator positions a crew member, the following shall apply...**

<p>(a) <b>positioning after reporting</b> but prior to operating shall be counted as FDP but shall not count as a sector;</p> <p>(b) all <b>time spent on positioning</b> shall count as duty period.</p>	<p><b>FAQ – CS.FTL.215</b></p> <p><i>For the purpose of FTL limits is never counted as a sector. A flight duty period which comprises positioning starts with reporting for that duty period.</i></p>
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**ORO.FTL.220 Split Duty** **The conditions for extending the basic maximum FDP due to a break on the ground shall be in accordance with the following...**

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(a) flight time specification schemes shall specify the following elements for split duty in accordance with the certification specifications applicable to the type of operation:

- (1) the minimum duration of a break on the ground; and
- (2) the possibility to extend the FDP prescribed under point ORO.FTL.205(b) taking into account the duration of the break on the ground, the facilities provided to the crew member to rest and other relevant factors;
- (b) the break on the ground shall count in full as FDP;
- (c) split duty shall not follow a reduced rest.

Neither the regulation nor the associated certification specifications or other material clearly limit the number of breaks on the ground.

However, the operator's general responsibility along with the limits related to ORO.FTL.220 require a thorough analysis whether under fatigue aspects a FDP with multiple breaks can be acceptable. To a minimum, the type of operation, location of the break, quality of the facilities, ability to acquire sleep and a limit of 18 hrs. of time of wakefulness must be considered. Further, FRM principles are advisable.

CS FTL.1.220 Split Duty

The increase of limits on flight duty, under the provisions of ORO.FTL.220, complies with the following...

- (a) The break on the ground within the FDP has a minimum duration of 3 consecutive hours.
- (b) The break excludes the time allowed for post and pre-flight duties and travelling. The minimum total time for post and pre-flight duties and travelling is 30 minutes. The operator specifies the actual times in its operations manual.
- (c) The maximum FDP specified in ORO.FTL.205(b) may be increased by up to 50 % of the break.
- (d) Suitable accommodation is provided either for a break of 6 hours or more or for a break that encroaches the window of circadian low (WOCL).
- (e) In all other cases:
  - (1) accommodation is provided; and
  - (2) any time of the actual break exceeding 6 hours or any time of the break that encroaches the WOCL does not count for the extension of the FDP.
- (f) Split duty cannot be combined with in-flight rest.

GM1 CS FTL.1.220 (b)

POST, PRE-FLIGHT DUTY AND TRAVELLING TIMES

The operator should specify post and pre-flight duty and travelling times taking into account aircraft type, type of operation and airport conditions.

**FAQ – CS.FTL.1.220(d)**

*Suitable accommodation should be provided for any split duty when crew members are in an unknown state of acclimatisation, since their WOCL cannot be determined.*

**ORO.FTL.225 Standby and Duties at the Airport**

**If an operator assigns crew members to standby or to any duty at the airport, the following shall apply in accordance with the certification specifications applicable to the type of operation...**

- (a) **standby and any duty at the airport** shall be in the roster and the start and end time of standby shall be defined and notified in advance to the crew members concerned to provide them with the opportunity to plan adequate rest;
- (b) a crew member **is considered on airport standby** from reporting at the reporting point until the end of the notified airport standby period;
- (c) airport standby shall **count in full** as duty period for the purpose of points ORO.FTL.210 and ORO.FTL.235;
- (d) any duty at the airport shall count in full as duty period and the FDP shall count in full from the airport duty reporting time;
- (e) the operator shall provide accommodation to the crew member on airport standby;
- (f) flight time specification schemes shall specify the following elements...
  - (1) the maximum duration of any standby;
  - (2) the impact of the time spent on standby on the maximum FDP that may be assigned, taking into account facilities provided to the crew member to rest, and other relevant factors such as:
    - the need for immediate readiness of the crew member,
    - the interference of standby with sleep, and
    - sufficient notification to protect a sleep opportunity between the call for duty and the assigned FDP;
  - (3) **the minimum rest period following standby** which does not lead to assignment of an FDP;
  - (4) how time spent on standby other than airport standby shall be counted for the purpose of cumulative duty periods.

**CLARIFICATION REQUIRED ...**

*Any duty at the airport...*  
← ORO.FTL225 (d)  
*...shall count in full from the airport duty reporting time*  
  
contradicts  
  
↓ CS.FTL.1.225 (a)(2)(i)  
*(2) If an assigned FDP starts during airport standby, the following applies:  
(i) the FDP counts from the start of the FDP.*  
  
*The wording could be misleading → Duty immediately prior to a flight duty counts in full as flight duty.*

**FAQ – ORO.FTL.225(a), GM1 CS FTL**

*“Duties can be changed but the crew member has to be able to plan adequate rest.”  
For a standby period, the beginning and the end must be rostered as well as a defined rest period following the standby. During standby either duty or the end of standby may be assigned.*

**(a) Airport standby:**

- (1) If not leading to the assignment of an FDP, airport standby is followed by a rest period as specified in ORO.FTL.235.
- (2) If an assigned FDP starts during airport standby, the following applies:
- (i) the FDP counts from the start of the FDP. The maximum FDP is reduced by any time spent on standby in excess of 4 hours;
- (ii) the maximum combined duration of airport standby and assigned FDP as specified in ORO.FTL.205(b) and (d) is 16 hours.

**(b) Standby other than airport standby:**

- (1) the maximum duration of standby other than airport standby is 16 hours;
- (2) The operator's standby procedures are designed to ensure that the combination of standby and FDP do not lead to more than 18 hours awake time;

GM1 CS FTL.1.225(b)(2)

**AWAKE TIME**

Scientific research shows that continuous awake in excess of 18 hours can reduce the alertness and should be avoided.

- (3) 25% of time spent on standby other than airport standby counts as duty time for the purpose of ORO.FTL.210;
- (4) standby is followed by a rest period in accordance with ORO.FTL.235;
- (5) standby ceases when the crew member reports at the designated reporting point;
- (6) if standby ceases within the first 6 hours, the maximum FDP counts from reporting;
- (7) if standby ceases after the first 6 hours, the maximum FDP is reduced by the amount of standby time exceeding 6 hours;
- (8) if the FDP is extended due to in-flight rest according to CS FTL.1.205(c), or to split duty according to CS FTL.1.220, the 6 hours of paragraph (6) and (7) are extended to 8 hours;
- (9) if standby starts between 23:00 and 07:00, the time between 23:00 and 07:00 does not count towards the reduction of the FDP under (6), (7) and (8) until the crew member is contacted by the operator; and
- (10) the response time between call and reporting time established by the operator allows the crew member to arrive from his/her place of rest to the designated

**CLARIFICATION REQUIRED ...**

*Since airport standby must be scheduled in advance a planned FDP may not be converted to airport standby after reporting.*

**FAQ – CS.FTL.1.225(a)(2)(ii)**

*The cap of 16 (resp. 18) hours is not applicable if other mitigating measures are provided (such as in-flight rest, split duty...) With an in-flight rest facility available and used the 18 hours awake time limit is considered not to be limiting.*

***Napping** is only acceptable in regards to unforeseen circumstances and does not lift the limit. Rather the opposite – excessive napping may be an indicator for an insufficient standby procedure.*

GM1 CAT.OP.S.MPA.210

(c) Controlled rest taken in this way should not be considered to be part of a rest period for the purposes of calculating flight time limitations, nor used to justify any duty period. Controlled rest may be used to manage both sudden unexpected fatigue and fatigue that is expected to become more severe during higher workload periods later in the flight. Controlled rest is not related to fatigue management, which is planned before flight.

**FAQ – CS.FTL.1.225(b)**

*Time between notification and reporting is considered Standby. If a rest period is provided between notification and reporting, only the time until notification of the assignment is counted as standby.*

**FAQ – CS.FTL.1.225**

*Any combined standby and airport standby must observe the most limiting result from both rule sets. A crew member should not be assigned to an FDP starting after a standby period has ended. A rest period should start after the end of the standby; an extension of a standby period beyond the rostered finishing time is not foreseen in the rule.*

*According to CAT.OP.MPA.210 (a)(3),*

*during all phases of flight each flight crew member required to be on duty in the flight crew compartment shall remain alert. If a lack of alertness is encountered, appropriate countermeasures shall be used. If unexpected fatigue is experienced, a*

<p>reporting point within a reasonable time.</p> <p>GM1 CS FTL.1.225 (b) STANDBY OTHER THAN AIRPORT STANDBY NOTIFICATION Operator procedures for the notification of assigned duties during standby other than airport standby should avoid interference with sleeping patterns if possible.</p> <p>GM1 CS FTL.1.225 MINIMUM REST AND STANDBY (a) If airport or other standby initially assigned is reduced by the operator during standby that does not lead to an assignment to a flight duty period, the minimum rest requirements specified in ORO.FTL.235 should apply. (b) If a minimum rest period as specified in ORO.FTL.235 is provided before reporting for the duty assigned during the standby, this time period should not count as standby duty. (c) Standby other than airport standby counts (partly) as duty for the purpose of ORO.FTL.210 only. If a crew member receives an assignment during standby other than airport standby, the actual reporting time at the designated reporting point should be used for the purpose of ORO.FTL.235.</p>	<p><i>controlled rest procedure, organised by the commander, may be used if workload permits. Controlled rest taken in this way shall not be considered to be part of a rest period for purposes of calculating flight time limitations nor used to justify any extension of the duty period.</i></p> <p><b>NOTE:</b></p> <p>Fatigue will always be a factor in flight operations. The target cannot be to avoid fatigue per se – otherwise almost any kind of flight operation would have to be terminated immediately</p> <p>The goal should be to avoid undue fatigue for the purpose to achieve an acceptable level of alertness.</p> <p>From an operational as well as from a safety point of view it appears quite reasonable to use napping as a strategic tool to raise the all-over safety level even without the presence of sudden or unexpected fatigue.</p>
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**ORO.FTL.230 Reserve If an operator assigns crew members to reserve, the following requirements shall apply in accordance with the certification specifications applicable to the type of operation:**

<p>(a) reserve shall be in the roster;</p> <p>GM1 ORO.FTL.230 (a) ROSTERING OF RESERVE Including reserve in a roster, also referred to as 'rostering', implies that a reserve period that does not result in a duty period may not retrospectively be considered as part of a recurrent extended recovery rest period.</p> <p>(b) flight time specification schemes shall specify the following elements:</p> <p>(1) the maximum duration of any single reserve period;</p> <p>(2) the number of consecutive reserve days that may be assigned to a crew member.</p>	<p><b>FAQ – ORO.FTL.230</b></p> <p><i>ORO.FTL.230(a) states that reserve must be in the roster. The meaning of 'including reserve in the roster' is explained in GM1 ORO.FTL.230(a).</i></p> <p><i>Therefore, a reserve period that does not result in a duty period <b>may not retroactively</b> be considered as part of a recurrent extended recovery rest period.</i></p>
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**CS FTL.1.230 Reserve The operator assigns duties to a crew member on reserve under the provisions of ORO.FTL.230 complying with the following:**

<p>(a) An assigned FDP counts from the reporting time.</p> <p>(b) Reserve times do not count as duty period for the purpose of ORO.FTL.210</p>	<p><b>FAQ – CS FTL.1.230(b)</b></p>
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<p>and ORO.FTL.235.</p> <p>(c) The operator defines the maximum number of consecutive reserve days within the limits of ORO.FTL.235(d).</p> <p>GM1 CS FTL.1.230(c) RECURRENT EXTENDED RECOVERY REST        ORO.FTL.235 (d) applies to a crew member on reserve.</p> <p>(d) To protect an 8-hour sleep opportunity, the operator rosters a period of 8 hours, taking into account <b>fatigue management principles</b>, for each reserve day during which a crew member on reserve is not contacted by the operator.</p> <p>GM1 CS FTL.1.230 RESERVE NOTIFICATION        Operator procedures for the notification of assigned duties during reserve should avoid interference with sleeping patterns if possible.</p> <p>GM2 CS FTL.1.230 NOTIFICATION IN ADVANCE        The minimum 'at least 10 hours' between the notification of an assignment for any duty and reporting for that duty during reserve may include the period of 8 hours during which a crew member on reserve is not contacted by the operator.</p>	<p><i>In accordance with CS FTL.1.230(b), reserve times do not count as duty period for the purpose of ORO.FTL.210 and ORO.FTL.235. That means that there is no requirement for a minimum rest period after reserve if no duty has been assigned.</i></p> <p><i>'Reserve' and 'standby' allow for ad hoc assignments; however, duties may also be assigned through re-planning. Initially, the operator assigns duties by publishing a roster. A roster may be changed; however, rostered duties need to be published in a way that allows crew members to plan adequate rest.</i></p> <p><b>CLARIFICATION REQUIRED ...</b></p> <p><b>FRM – the scope of “fatigue management principles” needs to be determined.</b></p>
<p><b>ORO.FTL.235 Rest Periods</b></p>	
<p><b>(a) Minimum rest period at home base.</b></p> <p>(1) The minimum rest period provided before undertaking an FDP starting at home base shall be at least as long as the preceding duty period, or 12 hours, whichever is greater.</p> <p>(2) By way of derogation from point (1), the minimum rest provided under point (b) applies if the operator provides suitable accommodation to the crew member at home base.</p> <p>GM1 ORO.FTL.235 (a)(2) MIN. REST PERIOD AT HOME BASE IF SUITABLE ACC. ...        An operator may apply the minimum rest period away from home base during a rotation, which includes a rest period at a crew member’s home base. This applies only if the crew member does not rest at his/her residence, or temporary accommodation, because the operator provides suitable accommodation. This type of roster is known as "back-to-back operation".</p> <p><b>(b) Minimum rest period away from home base.</b></p> <p>The minimum rest period provided before undertaking an FDP starting away from home base shall be at least as long as the preceding duty period, or 10 hours, whichever is greater. This period shall include an 8-hour sleep opportunity in addition to the time for travelling and physiological needs.</p>	<p><b>FAQ – ORO.FTL.235</b></p> <p><i>Planning and actual duty must comply with all requirements of this regulation. Thus, even office duty has to be considered according to actual times and not along predetermined times.</i></p> <p><b>FAQ – ORO.FTL.235(d)</b></p> <p><i>Considering ORO.FTL.205(f) the 168 hrs. period may not be extended under Commander’s Discretion or any other mean except under an approved derogation.</i></p> <p><b>NOTE:</b></p> <p>Scientific findings show, that for best recovery and alertness layovers should respect the WOCL and be planned in a way, that a sleep period just prior departure is</p>

AMC1 ORO.FTL.235 (b)

MINIMUM REST PERIOD AWAY FROM HOME BASE

The time allowed for physiological needs should be 1 hour. Consequently, if the travelling time to the suitable accommodation is more than 30 minutes, the operator should increase the rest period by twice the amount of difference of travelling time above 30 minutes.

(c) Reduced rest

By derogation from points (a) and (b), flight time specification schemes may reduce the minimum rest periods in accordance with the certification specifications applicable to the type of operation and taking into account the following elements:

- (1) the minimum reduced rest period;
- (2) the increase of the subsequent rest period;
- (3) and the reduction of the FDP following the reduced rest.

(d) Recurrent extended recovery rest periods

Flight time specification schemes shall specify recurrent extended recovery rest periods to compensate for cumulative fatigue. The minimum recurrent extended recovery rest period shall be 36 hours, including 2 local nights, and in any case the time between the end of one recurrent extended recovery rest period and the start of the next extended recovery rest period shall not be more than 168 hours. The recurrent extended recovery rest period shall be increased to 2 local days twice every month.

(e) Flight time specification schemes shall specify additional rest periods in accordance with the applicable certification specifications to compensate for:

- (1) the effects of time zone differences and extensions of the FDP;
- (2) additional cumulative fatigue due to disruptive schedules; and
- (3) a change of home base.

likely to be obtained. Thus a somewhat shorter period could still provide an equal and eventually even better recovery. Most likely it could be acceptable to include a modification of the RecRest into "CD". The option could be mitigated with a requirement to extend the next rest period to match the requirements for a RecRest!

NOTE:

Recurrent extended recovery rest periods ↔ RecRest

CLARIFICATION REQUIRED ...

CS.FTL.1.235(d)

Does AMC1 ORO.FTL.235 (b) also apply? Otherwise excessive ground transport could shorten the available time for rest significantly.

CLARIFICATION REQUIRED ...

CS.FTL.1.235(d)

Do 5 consecutive local nights satisfy the requirement for 2 local nights twice a month?

CS FTL.1.235 Rest Periods

CLARIFICATION REQUIRED ...

BASICS (Time Zone Crossing - the way it should be...)

For the determination of rest, time zone crossing becomes significant when within one rotation a time difference of 4 hours or more between reference time when leaving home base and place of rest away from home base was covered.

	<p>For the application of Table 3(i) the values should be understood as...</p> <p>...the maximum time difference between reference time <i>when leaving home base</i> and local time where a crew member rests during a rotation.</p> <p>...time elapsed since reporting at home base until return to home base for a rest period during which the operator is no longer responsible for the accommodation of the crew member.</p> <p>A rest period according to time zone crossing and a RECCrest period may run concurrently.</p> <p>However, the text as given in Table 3(i) could be seen as if it allows multiple interpretation which frequently do not correspond to scientific findings but operational preferences.</p> <p>It should be understood, that the extended rest at home base is provided for a resynchronization of the reference time which is independent to the combination of duty within the rotation.</p> <p><b>CLARIFICATION REQUIRED ...</b></p> <p><b>FAQ – CS.FTL.1.235(b)(3)(i)</b></p> <p><i>Table “Min. local nights...” clarification required for the use of “reference time” to outline that the “reference time at reporting for first duty” shall be used.</i></p> <p><b>FAQ – CS.FTL.1.235(b)(3)(ii)</b></p> <p><i>Does AMC1 ORO.FTL.235 (b)( → physiological needs) also apply?</i></p> <p><b>CLARIFICATION REQUIRED ...</b></p> <p><b>FAQ – CS FTL.1.235(b)(4)</b></p> <p><i>...shall be understood as the transition through home base from a time zone difference of 6 or more to a time zone difference of 4 or more in opposite direction.</i></p>
<p><b>(a) Disruptive schedules</b></p> <p>(1) If a transition from a late finish/night duty to an early start is planned at home base, the rest period between the 2 FDPs includes 1 local night.</p> <p>(2) If a crew member performs 4 or more night duties, early starts or late finishes between 2 extended recovery rest periods as defined in ORO.FTL.235 (d), the second extended recovery rest period is extended to 60 hours.</p> <p><b>(b) Time zone differences</b></p> <p>(1) For the purpose of ORO.FTL.235 (e)(1), ‘rotation’ is a series of duties, including at least one flight duty, and rest period out of home base, starting at home base</p>	<p><b>FAQ – CS FTL.1.235(a)(1)</b></p> <p><i>A duty can only be classified as disruptive if a crew member is acclimatised when reporting. No matter where the duty ends, the local time at the reporting point (i.e. “reference time”) shall be used as orientation to determine if a duty is ‘disruptive’.</i></p> <p><i>NOTE: The rule refers to “flight duty” only.</i></p>

and ending when returning to home base for a rest period where the operator is no longer responsible for the accommodation of the crew member.

(2) The operator monitors rotations and combinations of rotations in terms of their effect on crew member fatigue, and adapts the rosters as necessary.

(3) Time zone differences are compensated by additional rest, as follows:

(i) At home base, if a rotation involves a 4 hour time difference or more, the minimum rest is as specified in the following table.

(...see next column → Minimum local nights of rest at home base to compensate for time zone differences.....)

(ii) Away from home base, if an FDP involves a 4-hour time difference or more, the minimum rest following that FDP is at least as long as the preceding duty period, or 14 hours, whichever is greater. By way of derogation from point (b)(3)(i) and only once between 2 recurrent extended recovery rest periods as specified in ORO.FTL.235 (d), the minimum rest provided under this point (b)(3)(ii) may also apply to home base if the operator provides suitable accommodation to the crew member.

**GM1 CS FTL.1.235 (b)(3) TIME ELAPSED SINCE REPORTING**

The time elapsed since reporting for a rotation involving at least a 4-hour time difference to the reference time stops counting when the crew member returns to his/her home base for a rest period during which the operator is no longer responsible for the accommodation of the crew member.

**GM2 CS FTL.1.235(b)(3) Additional rest to compensate for time zone differences**

**REST AFTER ROTATIONS WITH THREE OR MORE FLIGHT DUTY PERIODS**

For a rotation with three or more FDPs, the greatest time zone difference from the original reference time should be used to determine the minimum number of local nights of rest to compensate for time zone differences. If such a rotation includes time zones crossings in both directions, the calculation is based on the highest number of time zones crossed in any one FDP during the rotation.

(4) In case of an Eastward-Westward or Westward-Eastward transition, at least 3 local nights of rest at home base are provided between alternating rotations.

(5) The monitoring of combinations of rotations is conducted under the operator's **management system** provisions.

**(c) Reduced rest**

(1) The minimum reduced rest periods under reduced rest arrangements are 12 hours at home base and 10 hours out of base.

**Minimum local nights of rest at home base ...**

Maximum time difference (h) between reference time and local time where a crew member rests during a rotation	Time elapsed (h) since reporting for the first FDP in a rotation involving at least 4-hour time difference to the reference time			
	<48	48-71:59	72-95:59	≥96
≤ 6	2	2	3	3
> 6 and ≤ 9	2	3	3	4
> 9 and ≤ 12	2	3	4	5

**BASICS (Time Zone Compensation away from HB...)**

Any travelling time beyond 30 minutes shall be added twice to the minimum rest as defined under CS.FTL.1.235 (b)(ii)

...see → AMC1 ORO.FTL.235 (b)

At place of rest accommodation shall be typically provided in proximity to the airport of arrival and departure; considering GM1 CS FTL.1.200 no travelling time should exceed 90 minutes in either direction.

**BASICS (departure out of HB without being acclimatized to HB)**

Example:

Crew member leaves HB for a layover with a time difference of >2 and <4 hours and departs the layover after more than 48 hrs of absence. For a second departure, out of HB within 48 hrs the reference time is still the layover time zone.

**FAQ – CS FTL.1.235(b)(4)**

*Eastward - Westward and Westward - Eastward transition' means the transition at home base between a rotation crossing 6 or more time zones in one direction and a rotation crossing 4 or more time zones in the opposite direction.*

← (5) SMS – the scope of the "monitoring" needs to be determined.



<p>(2) Reduced rest is used under <b>fatigue risk management</b>.</p> <p>(3) The rest period following the reduced rest is extended by the difference between the minimum rest period specified in ORO.FTL.235 (a) or (b) and the reduced rest.</p> <p>(4) The FDP following the reduced rest is reduced by the difference between the minimum rest period specified in ORO.FTL.235 (a) or (b) as applicable and the reduced rest.</p> <p>(5) There is a maximum of 2 reduced rest periods between 2 recurrent extended recovery rest periods specified in accordance with ORO.FTL.235 (d).</p>	<p>← (2) FRM – required for reduced rest.</p>
<p>ORO.FTL.240 Nutrition</p>	
<p>(a) During the FDP there shall be the opportunity for a meal and drink in order to avoid any detriment to a crew member’s performance, especially when the FDP exceeds 6 hours.</p> <p>(b) An operator shall specify in its operations manual how the crew member’s nutrition during FDP is ensured.</p> <p>AMC1 ORO.FTL.240 <span style="margin-left: 200px;">MEAL OPPORTUNITY</span></p> <p>(a) The operations manual should specify the minimum duration of the meal opportunity, when a meal opportunity is provided, in particular when the FDP encompasses the regular meal windows (e.g. if the FDP starts at 11:00 hours and ends at 22:00 hours meal opportunities for two meals should be given).</p> <p>(b) It should define the time frames in which a regular meal should be consumed in order not to alter the human needs for nutrition without affecting the crew member’s body rhythms.</p>	<p><b>BASICS (Nutrition)</b></p> <hr/> <p>AMC1 ORO.FTL.240 shall be understood as:</p> <p>The OM <b>must</b>...</p> <p>...specify the minimum duration of the meal opportunity...</p> <p>...and how it considers the provision for a meal opportunity in its scheduling system.</p>
<p>ORO.FTL.245 Records of Home Base, Flight Times, Duty and Rest Periods</p>	
<p><b>(a) An operator shall maintain, for a period of 24 months:</b></p> <p>(1) individual records for each crew member including:</p> <p>(i) flight times;</p> <p>(ii) start, duration and end of each duty period and FDP;</p> <p>(iii) rest periods and days free of all duties; and</p> <p>(iv) assigned home base;</p> <p>(2) reports on extended flight duty periods and reduced rest periods.</p> <p><b>(b) Upon request, the operator shall provide copies of individual records of flight times, duty periods and rest periods to:</b></p> <p>(1) the crew member concerned; and</p> <p>(2) to another operator, in relation to a crew member who is or becomes a crew member of the operator concerned.</p>	<p><b>FAQ – ORO.FTL.245</b></p> <hr/> <p><i>Flying activities such as training and testing conducted outside the scope of an AOC have an impact on fatigue.</i></p> <p><i>Cumulative fatigue is accrued not only from CAT activities but also during other flying activities. Therefore, to control cumulative fatigue in accordance with CAT.GEN.MPA.100, the crew member shall:</i></p> <p><i>“... (ii) provide each operator with the data needed to schedule activities in accordance with the applicable FTL requirements.”</i></p> <p><i>This is also reflected in ORO.FTL.115:</i></p>

(c) Records referred to in point CAT.GEN.MPA.100 (b)(5) in relation to crew members who undertake duties for more than one operator shall be kept for a period of 24 months.

*Crew Member Responsibilities*

**ORO.FTL.250 Fatigue Management Training**

- (a) The operator shall provide initial and recurrent fatigue management training to crew members, personnel responsible for preparation and maintenance of crew rosters and management personnel concerned.
- (b) This training shall follow a training programme established by the operator and described in the operations manual. The training syllabus shall cover the possible causes and effects of fatigue and fatigue countermeasure.

AMC1 ORO.FTL.250

**TRAINING SYLLABUS FATIGUE MANAGEMENT TRAINING**

The training syllabus should contain the following:

- (a) applicable regulatory requirements for flight, duty and rest;
- (b) the basics of fatigue including sleep fundamentals and the effects of disturbing the circadian rhythms;
- (c) the causes of fatigue, including medical conditions that may lead to fatigue;
- (d) the effect of fatigue on performance;
- (e) fatigue countermeasures;
- (f) the influence of lifestyle, including nutrition, exercise, and family life, on fatigue;
- (g) familiarity with sleep disorders and their possible treatments;
- (h) where applicable, the effects of long range operations and heavy short range schedules on individuals;
- (i) the effect of operating through and within multiple time zones; and
- (j) the crew member responsibility for ensuring adequate rest and fitness for flight duty.

**(FRM) FATIGUE MANAGEMENT TRAINING**  
...should be understood as an “alertness management training” for crew members or a “fatigue awareness” training for personnel responsible for rostering as well as for management personnel.