

Questions and Answers on the new EU fatigue management regulation for commercial air transport (CAT) with aeroplanes

1. Why do the existing FTL rules of Subpart Q, which only apply since 2008, have to be changed yet again?

Historically flight and duty time limitations and rest requirements (FTL) were set by each Member State (MS). The national FTL were developed to cater for local operational needs and taking account of the different historical, cultural, social and geographical conditions of individual MSs. The risks arising from crew member fatigue were not identified systematically.

Regulation 1899/2006 (EU-OPS¹) Subpart Q introduced a first mandatory framework for a European FTL complementing the existing EU social legislation contained in the aviation working time Directive². This first European FTL was, however, more the result of a political process than of a thorough risk assessment based on scientific principles and did not address national specificities. Actually, it mainly covered European short/medium-haul operations, leaving some key elements, particularly those associated to long-haul operations, still subject to national provisions. The European Legislator, aware of these weak points in Subpart Q, instructed the Agency to undertake a scientific evaluation of Subpart Q³ and issue certifications specifications and the related implementing rules, taking into account the latest scientific and technical evidence⁴.

Conscious of the complexity of designing a prescriptive system to manage the risks arising from crew member fatigue, the Legislator introduced with Subpart Q a basic set of operator responsibilities further than the mere requirement to remain within the general envelop of the prescriptive limits. These operator responsibilities have been refined in support of the idea that the operator's management system should manage all risks, including the risk of flight and cabin crew being fatigued⁵.

The introduction of Fatigue Risk Management System (FRMS) as an optional means to manage the risks arising from crew member fatigue into ICAO Annex 6 Part I had to be embodied into the European regulatory framework. Therefore, the new EU fatigue management regulation, in alignment with ICAO, develops the objectives of an operator's management system specifically covering the management of fatigue risks. Under the revised rule operators shall monitor and manage the risks resulting from crew member fatigue as a consequence of certain scheduling practices⁶ on top of complying with the established 'hard' numbers.

¹ Commission Regulation (EC) **No 1899/2006** of 12 December 2006 amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane (Annex III - hereafter referred to as **EU OPS**).

² Council Directive 2000/79/EC of 27 November 2000 concerning the European Agreement on the Organisation of Working Time of Mobile Workers in Civil Aviation concluded by the Association of European Airlines (AEA), the European Transport Workers' Federation (ETF), the European Cockpit Association (ECA), the European Regions Airline Association (ERA) and the International Air Carrier Association (IACA).

³ Article 8a of EU-OPS

⁴ Article 22(2)(a) of Regulation (EC) No 216/2008

⁵ ORO.GEN.200(3) of Annex II to Commission Regulation (EU)

⁶ ORO.FTL.205 extended FDPs for unaugmented crews when crew members are in an un-known state of acclimatisation; CS FTL.1.205 "Long Night Duties"; CS FTL.1235 (b)(5) the monitoring of rotations; CS FTL.1.235(c) reduced rest

2. What are the factors contributing to fatigue of aircrew?

ICAO defines fatigue as “a physiological state of reduced mental or physical performance capability resulting from *sleep loss or extended wakefulness, circadian phase, or workload* (mental and/or physical activity) that can impair a crewmember’s alertness and ability to safely operate an aircraft or perform safety-related duties”.

In this context it is paramount to understand that *sleep is the only effective fatigue countermeasure*. Whilst muscles can recover with rest, the brain can only recover with sleep.

A system to effectively manage fatigue, be it prescriptive or performance based, must be based on scientific principles. The scientific principles used for the revision of this rule are in a nutshell:

- An average adult person needs between 6 and 8 hours of sleep per day to sustain optimal performance.
- The effects of sleep loss on performance degradation are cumulative and dose-dependent.
- The quality of sleep depends on the structure and continuity of sleep. The quality of sleep depends, amongst other factors, of the time of the day.
- There are two biological ‘windows’ for sleep in a day, one during the night, covering the Window of Circadian Low (WOCL)⁷ and the other one in the afternoon. These are determined by physiological processes such as increase and decrease of body temperature and blood pressure.
- Sleep at sub-optimal times in the circadian rhythm is likely to be shorter and of lower quality.
- The pressure to sleep increases with the duration of sustained wakefulness and depends on the circadian body clock.
- The combination of sustained wakefulness (or sleep deprivation) and a phase of the circadian body clock favourable for sleep result in sleepiness followed by micro-sleeps and lastly uncontrolled sleep.

Performance consequences of fatigue are, amongst others, slower reaction times, poorer coordination, difficulties to sustain attention, fixation, less creative problem-solving.

3. What needs to be managed?

The prevention of fatigue through a rostering system is one of the essential requirements for air operations⁸. Such a rostering system needs to address the scientifically identified contributors to and countermeasures against fatigue. Defined rest periods, which allow for sufficient high quality sleep, are the only effective fatigue countermeasure. Sleep loss, extended wakefulness, circadian phase, workload and the cumulative effects of fatigue need to be managed by a combination of limitations to flight time, flight duty periods, duty periods. The requirements for rest periods must allow for a complete dissipation of the physiological sleep pressure following extended wakefulness and take account of the cumulative effects following restricted sleep periods.

⁷ Between 2am and 6am

⁸ Point 8.f. of Annex IV to Regulation (EC) No 216/2008

Consequently, a rostering system must take into account the number of sectors flown (to address the workload), time-zone crossing (jet lag), sleep deprivation (due to long duty days or restricted sleep periods), disruption of circadian cycles (early starts, late arrivals), night hours (operations against the circadian body clock), positioning, cumulative duty time for given periods of time, sharing of allocated tasks between crew members, and also the provision of augmented crews.

4. How does the rule address these issues?

The regulation proposes the following key measures to mitigate the risks arising from major factors affecting human fatigue as stipulated by scientific literature:

Key elements of the new EU FTL	Fatiguing effect
<p>The Flight Duty Periods (FDP) is limited to 13 hrs for favourable starting times.</p> <p>FDP for the most unfavourable starting times has been limited to 11 hours. Operators must apply appropriate fatigue risk management to night duties of more than 10 hours.</p> <p>Extensions of the maximum limits are not allowed for unfavourable starting times and limited to one hour for favourable starting times if crew members are given the opportunity to be well-rested.</p>	<p><i>Time of day</i></p> <p>Fatigue is, in part, a function of <i>circadian rhythms</i>. Human waking and sleep cycles follow a 24-hour cyclical wave pattern known as the internal body clock. Fatigue is most likely and, when present, most severe, during a four hour period between the hours of 2:00 AM and 6:00 AM, the so-called <i>Window of Circadian Low</i> (WOCL) when the body is programmed to sleep and during which performance is degraded.</p>
<p>Rest provisions are designed to protect an 8-hour sleep opportunity, in addition to the time crew members need to travel to and from their place of rest and other physiological needs. Longer FDPs are compensated by longer rest periods at least as long as the FDP or enough time to protect the 8-hour sleep opportunity, whichever is greater.</p> <p>Reduced rest provisions have been tightened compared to existing national regulations and include now a guaranteed 8-hour sleep opportunity.</p> <p>Standby rules have been amended and a new rule on Reserve has been introduced. A mandatory 10 hour notification period protects the opportunity for undisturbed rest prior to commencing the duty. In other cases the subsequent FDP is limited.</p>	<p><i>Amount of recent sleep.</i></p> <p>If a person has had significantly less than 8 hours of sleep in the past 24 hours, he or she is more likely to be fatigued.</p>

Key elements of the new EU FTL

Fatiguing effect

FDP limits have been amended taking account of more or less favourable starting times.

Provisions to extend an FDP with in-flight rest take account of the likelihood to achieve recuperative sleep and the duration of such a sleep opportunity on board.

Provisions to extend and FDP with a break on the ground (split duty) are based on the same principles.

Standby duty rules take account of the time awake by reducing the FDP or by limiting the duration of the combination of airport standby and FDP.

Time awake.

A person who has been continuously awake more than 17 hours since his or her last major sleep period is more likely to be fatigued.

An extended recovery rest period of 36 hours including two full night's sleeps must be provided after 7 days. This extended recovery rest period is increased by 12 hours to two days twice a month.

The revised rules acknowledge the fatiguing effect of disruptive schedules (i.e. starting early in the morning or finishing late at night) and propose increasing the (weekly) extended recovery rest to give crew members the opportunity to recover their sleep debt.

The revised rule guarantees a minimum 8-hour sleep opportunity also under reduced rest.

A more comprehensive set of rules compensates the sleep disruption resulting from long-distance transmeridian travel (jet lag).

Cumulative sleep debt.

Sleep debt refers to the impact of receiving less than a full night's sleep for multiple days. For the average person, cumulative sleep debt is the difference between the sleep a person has received over the past several days, and the sleep they would have received if they had obtained 8 hours of sleep per night.

Key elements of the new EU FTL

Fatiguing effect

The maximum Flight duty period (FDP) is reduced depending on the number of take-offs and landings, which are considered to be more tiring particularly for flight crew members.

Provisions for extended FDP with in-flight rest rely on newly introduced minimum standards for in-flight rest facilities and prescribe a minimum duration of in-flight rest.

Provisions for extended FDP with a break on the ground (split duty) rely on newly defined minimum standards for the rest facilities on the ground and include provisions to protect a minimum duration of the sleep opportunity.

Rest requirements depend on the length of the previous duty to ensure that the crew is well-rested for the subsequent FDP. Extended FDPs are compensated by additional rest.

Time on task.

The longer a person has continuously been doing a job without a break, the more likely he or she is to be fatigued.

5. Are these rules based on the latest scientific facts?

The Agency reflected the findings of all relevant publicly available scientific studies. However, the results of a number of scientific studies, conducted in a context significantly different to the European regulatory framework (in particular in term of rest requirements) or in a very specific operational context, could not be taken into account literally, but rather on a qualitative, or even indicative basis.

It is therefore important to monitor if the objectives are indeed achieved in an effective and efficient manner once the new rules are in place. This is foreseen by a paragraph of the Cover Regulation instructing the Agency to conduct a review of the effectiveness of the updated provisions based on operational data gathered on long term basis after entry into force.

6. What was EASA's methodology in drafting the new rules?

The Agency undertook an extensive and in its depth unprecedented consultation process, which included the assessment of a large amount of information and comments⁹ with the assistance of a group of industry experts and scientists¹⁰. Three regulatory impact assessments were conducted and it was finally possible to present a balanced solution, which found the support of the majority of stakeholders, MSs and the European Parliament.

⁹ Over 50.000 comments were processed during the NPA phase.

¹⁰ The NPA was assessed by three independent scientists.

This FTL expert group was composed of representatives from MSs, airlines as well as flight and cabin crew organisations, with an observer of the European Commission. The group met regularly between 2009 and 2012 to assist the Agency in drafting its proposal based on the comments received.

7. How does this revised rule differ from EU-OPS Subpart Q ?

The new EU fatigue management regulation harmonises the protection measures against fatigue in areas which under EU-OPS were left to be regulated by the MSs¹¹. For example, FDP extensions with in-flight rest or with a break on the ground (split duty).

A new requirement introduces fatigue management training for crew members, rostering and concerned management personnel to raise fatigue hazard awareness throughout the entire management structure of commercial air transport operators.

The revised rule also clarifies certain provisions in the benefit of safety, for example by providing a common table of maximum FDP.

Concerning the protection against cumulative fatigue after several days of duty, the rule introduces new elements of mitigation, i.e. to compensate for schedules that disrupt the sleep patterns or extensive time zone crossing.

The revised provisions are more conservative than those of Subpart Q in areas where relevant scientific evidence and operational experience have identified the need for improvement of the safety performance of the existing rules. For example, the time window during which the FDP is limited to 11 hours has been expanded and the possibility to extend an FDP has been removed for night flights. On top of that the rule instructs operators to actively manage the fatiguing effect of night duties of more than 10 hours by applying appropriate fatigue risk management.

8. Why has EASA decided to have, next to Implementing Rules, also Certification Specifications for FTL rules? Wouldn't a set of prescriptive "hard law" be better to ensure a level-playing field?

The Agency has indeed translated Subpart Q into Implementing Rules (IR) (i.e. hard law), with some amendments where scientific evidence has identified a clear need for safety improvement. Only for those areas that had previously been left to the national legislator by Article 8(4) of EU OPS, the Agency has introduced Certification Specifications (CS). These CS concern mainly standby, additional rest to compensate for time zone differences, reduced rest and the extension of a flight duty period due to in-flight rest. The CS are inspired by existing national rules, operational experience and based on scientific principles.

Since both, IR and CS have to be complied with in their entirety, the proposed rule structure promotes a level-playing field. Both the IR and CS will be the basis of operators' FTL schemes. However, an Operator may deviate from a CS provided that an equivalent level of safety can be demonstrated, the request proposed by the operator has been endorsed by its competent authority and has passed the Agency's technical assessment based on a scientific and medical evaluation. In summary, the CS provides

¹¹ Art. 8(4) EU-OPS

for “controlled flexibility”. This process is described in detail in Article 22(2) of the EASA Basic Regulation.

9. What is the maximum Flight duty period (FDP) and how does the revised rule distinguish between FDPs for long-haul and short-haul operators?

For short-haul operations:

Similar to Subpart Q, the rule establishes the maximum FDP depending on the following three scenarios:

a) for unaugmented crew operations depending on the most favourable starting time (0600 to 1329) of the flight duty, the basic maximum allowable FDP is 13 hours.

b) in line with scientific advice, this basic FDP for unaugmented crew operations can be increased to a maximum of 14 hours depending on the most favourable starting time (0700-1329) and only if pre- and post-flight rest is increased by a minimum of 2 hours or post-flight rest is increased by 4 hours. These extensions are only permitted twice a week, are subject to a number of limitations and must be planned.

c) finally, the revised rule also caters for the operational reality of a complex aviation network and allows extensions to the FDP by the commander in case of unforeseen circumstances under certain conditions. Under the provisions on commander’s discretion, which have been transposed from Subpart Q, the commander may increase the basic FDP by 2 hours for unaugmented crews. For augmented crews the commander may decide to increase the FDP up to 3 hours. In addition, the revised rule introduces new provisions on delayed reporting allowing operators to inform crew members of operational delays whilst they still are at their place of rest. This provision not only offers operators flexibility but also protects crew members from excessive levels of fatigue.

To take account of the workload induced fatigue, depending on the numbers of sectors (i.e. flights comprising take-off and landing) within a single FDP, the maximum allowable FDP is reduced by 30 minutes for each sector from the third sector onwards.

For long-haul operations:

For augmented crew operations (with in-flight rest), i.e. three-pilot or four-pilot operations, the extensions to the basic maximum FDP depend on the length of the in-flight rest taken during the flight and whether the rest has been taken in one of the following in-flight rest facilities:

- **class 1 facility:** similar to a bunk allowing a flat or near flat sleeping position;
- **class 2 facility:** 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, 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; or
- **class 3 facility:** 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.

The requirements for in-flight rest for cabin crew members are based on the same principle, but presented in a different way. To achieve a certain extension of the FDP, a prescribed in-flight rest period for each cabin crew member depends on the quality of the in-flight rest facility. Very long flights can only be operated if class 1 facilities are provided also to cabin crew members.

In line with scientists' views, the Agency was not convinced that in-flight rest arrangements in economy seats would allow for enough recuperative sleep that could justify an FDP extension due to in-flight rest. The rule ensures that FDP extensions depend on the quality of the in-flight rest arrangements.

10. Why does the revised rule allow a Flight Duty Period (FDP) of 11 hours at night, if some scientific advice advocates a maximum Flight Duty Period of only 10 hours?

The basic FDP limit is set to 11 hours at unfavourable starting times between 17:00 and 04:59. This limit is more protective than the current regime as the restriction to 11 hours is applied during a broader time window and this limit may only be reached under appropriate fatigue risk management. From the third sector onwards (i.e. from the third take-off and landing), the FDP is again reduced by 30 minutes for each sector, down to 9 hours from the 6th sector onwards and additional restrictions are placed on consecutive night duties.

The scientists contracted by the Agency have indeed advised a maximum FDP limit of 10 hours for overnight operations. Although this recommendation is resulting from a literature-based review of isolated FTL elements and relies on data stemming from research with only limited relevance for the case at hand, the rule mandates appropriate fatigue risk management of long night duties¹² The Agency has decided to allow 11 hours for overnight operations only if the fatiguing effects of night duties are actively managed in relation to the surrounding duties and rest periods. The possibility of an extension of night duties has been removed on the basis of the recognition of the impact of the circadian factor on fatigue.

11. Some stakeholders have stated that under the harmonised standby provisions crew members could be at the controls of a plane landing after over 20 hours of being awake. How does the revised rule address the issue of excessive awake times resulting from standby?

The rule introduces a 'cap' of 16 hours for the combined duration of airport standby and assigned FDP unless the assigned FDP includes a sleep opportunity, which is the case for extended FDPs with in-flight rest or a break on the ground.

The revised rule limits the duration of standby in a hotel or at the crew member's residence (standby other than airport standby) to 16 hours. The operator's standby procedures must be designed to ensure that the combination of standby and FDP do not lead to more than 18 hours awake time. Any time spent on standby in excess of 6 hours will reduce the maximum FDP by the time exceeding 6 hours.

The avoidance of fatigue is a shared responsibility of the operator and the individual crew member. During a standby period, unless a duty has been assigned, the crew member may remain resting and should manage his/her time allowing to take an additional nap(s) throughout the standby period if no duty is assigned at the beginning of the standby. The potential effect on cumulative fatigue of this form of standby is taken into account by counting 25% of the time spent on this form of standby as cumulative duty. Granting a minimum rest period with its 8-hour sleep opportunity

¹² Night duties of more than 10 hours.

between the end of the standby period, even if no duty is assigned, and the subsequent FDP, guarantees that crew members are able to report fully rested for their next duty.

12. The amount of rest plays an important role in mitigating against fatigue. How do the rest requirements take account of the need for restorative sleep?

The revised rule maintains different rest requirements at home (minimum 12 hours) and out of home base (10 hours) as known from Subpart Q. However, the length of the minimum rest must always be at least as long as the preceding duty period, must include an 8-hour sleep opportunity and must take into account the time for travelling and physiological needs. The actual rest period can therefore be longer than 12 or 10 hours respectively.

13. How does the rule address the additional need to mitigate against cumulative fatigue?

Besides the accumulation of duty hours, cumulative fatigue can be caused by many factors, including disruptive schedules (for example, starting early in the morning or ending late in the evening), extensive time zone crossings or combinations of rotations (for example, flying first to the east and then to the west or vice-versa). In all these cases, the rule introduces additional rest in comparison with current Subpart Q.

An additional limit for cumulative duty hours in 14 days has been introduced to avoid the fatiguing effect of too many duty hours in a short period of time.

The Subpart Q provisions for a weekly extended recovery rest period are improved by prolonging such periods, which must occur at least every 7 days, by 25% twice per month.

14. Reduced rest is an important element of flight time specification schemes across Europe. How does the revised rule address reduced rest?

The Agency has introduced harmonised provisions concerning reduced rest. They ensure a minimum 8-hour sleep opportunity and contain a number of limitations such as:

- the requirement to use Fatigue Risk Management (FRM);
- an extension of the subsequent rest period by the shortfall of the basic minimum rest;
- the reduction of the FDP following the reduced rest by the shortfall of the basic minimum rest; and
- a limit of a maximum of 2 reduced rests per week (i.e. between 2 recurrent extended recovery rest periods, which means a 7 day period).

15. Does the rule apply to different types of operations, e.g. charter operators or cargo operators?

The rules will apply to scheduled, charter and cargo operations, but will exclude on demand (air taxi) operations, emergency medical services and single pilot operations by aeroplanes. All helicopter operations are also excluded from the proposal. Separate rulemaking tasks will cover these operations. In the meantime, the current set of FTL

regulations (i.e. EU-OPS for aeroplanes, and national rules for helicopters) will continue to apply for these operations.

16. What will be the impact of the new EASA FTL rules on national rules?

The Basic Regulation aims at developing harmonised aviation safety regulation in order to ensure a high and uniform level of protection of the European citizen, mutual recognition and a level playing field. Under the new system, the elements of subsidiarity existing today under EU-OPS on FTL should not be allowed anymore for the types of operations now covered by the new Regulation. The impact of the EASA system on national rules is therefore twofold:

- Firstly, the possibility to apply national FTL rules is removed.
- Secondly, new rules fill the gaps that were left by EU-OPS to Member States and will therefore harmonise all aspects of FTL across Europe.

17. When will the new rules on FTL apply?

The Commission Regulation has been adopted on the 31st of January 2014 and will enter into force on the twentieth day following that of its publication in the Official Journal of the European Union.

The new Regulation foresees transition measures in the form of an application date two years after entry into force of the new requirements. Hereby operators should be given enough time to adapt to the new requirements.

The Regulatory Impact Assessment has identified a potentially more significant cost impact on a specific type of operation relying on the use of economy class seats for in-flight rest. Therefore, only for the provisions describing the conditions under which an FDP may be extended with in-flight rest, Member States may choose to delay the application one additional year on top of that.

18. What are the key features and safety improvements of the revised system?

The following table provides an **overview of the key features and main safety improvements**. A complete explanation of the rule as proposed can be found in the explanatory note and regulatory impact assessment of the Opinion 04/2012.

Key safety improvements	More restrictive than current EU FTL
General	
<ul style="list-style-type: none"> ▪ Harmonized safety standards of a high level across all EU-28 + 4 by introducing uniform safety requirements for all FTL aspects. 	✓ <i>Harmonised</i>
Home base	
<ul style="list-style-type: none"> ▪ A single airport location assigned with a high degree of permanence. 	✓ <i>New</i>

▪ Increased extended recovery rest period prior to starting duty after a change of home base. ✓ *New*

▪ Travelling between the former and the new home base counts as duty (either positioning or FDP). ✓ *New*

▪ Records on assigned home base to be kept for 24 months. ✓ *New*

Cumulative fatigue

▪ Improved requirement for extended recovery rest by removing the possibility to have an earliest reporting time after the extended recovery rest before 06:00. ✓ *Harmonised*

▪ Additional cumulative duty limit per 14 days. ✓ *New*

▪ Additional rolling limit per 12 calendar months. ✓ *New*

▪ Prolonged extended recovery rest period twice a months. ✓ *New*

▪ Increased extended recovery rest to compensate for disruptive schedules. ✓ *New*

Maximum basic daily FDP

▪ Time window during which the maximum FDP is limited to 11 hours is extended to cover 12 hours between 17:00 and 05:00. ✓ *New*

Planned FDP extensions

▪ The possibility to plan extensions for most unfavourable starting times has been removed. ✓ *New*

FDP extension due to in-flight rest

▪ Extension based on quality of in-flight rest facility. ✓ *Harmonised*

▪ No extension due to in-flight rest in economy seats. ✓ *New*

Commander's discretion

▪ Non-punitive reporting process. ✓ *New*

Split duty

▪ Defined minimum standards for accommodation and suitable accommodation. ✓ *New*

▪ Protection of useful break duration by excluding post and pre-flight duties and travelling from the break. ✓ *Harmonised*

Airport standby

- Defined minimum standards for accommodation during airport standby. ✓ *New*
- FDP reduced for time spent on airport standby in excess of 4 hours. ✓ *Harmonised*
- Limited duration of combination of airport standby plus FDP when called out (for FDPs with unaugmented crew and if no break on the ground is planned). ✓ *Harmonised*

Standby other than airport standby

- Duration limited to 16 hours. ✓ *Harmonised*
- 25% of standby time counts for the purpose of cumulative duty time calculation. ✓ *Harmonised*
- FDP reduced for time spent on standby in excess of 8 hours. ✓ *Harmonised*
- Reasonable response time between call and reporting time to be established by operator. ✓ *Harmonised*
- Standby has to be followed by a rest period. ✓ *New*

Reduced rest

- Protected 8-hour sleep opportunity. ✓ *Harmonised*
- Impact on cumulative fatigue mitigated by extension of the minimum rest period and reduction of the maximum FDP following the reduced rest. ✓ *Harmonised*
- Continuous monitoring of the performance of the rule with FRM. ✓ *New*

Rest to compensate for time zone differences

- Increased rest at destination. ✓ *Harmonised*
- Monitoring of fatiguing effects of rotations. ✓ *New*
- Additional rest after alternating rotations east-west / west-east. ✓ *New*
- Minimum rest at home base measured in local nights with a minimum of 2 local nights after significant (4 or more) time zone transitions depending on the number of time zone crossed and the duration of the time spent away. ✓ *Harmonised*

Fatigue management training

- Mandatory initial and recurrent training for crew members, crew rostering personnel and concerned management personnel. ✓ *New*
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Other elements

- Operator requirement to specify how nutrition is ensured in the Operations Manual. ✓ *New*
 - Improved requirements on record keeping. ✓ *New*
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