



OPINION No 04/2012

OF THE EUROPEAN AVIATION SAFETY AGENCY

of 28th September 2012

for a Regulation establishing Implementing Rules on Flight and Duty Time Limitations and rest requirements (FTL) for commercial air transport (CAT) with aeroplanes

AND

for a Regulation amending Commission Regulation (EC) No XXX/2012 of dd Month Year laying down technical requirements and administrative procedures related to air operations

'Implementing Rules on Flight and Duty Time Limitations and rest requirements (FTL) for commercial air transport (CAT) with aeroplanes'

EXECUTIVE SUMMARY

1. The purpose of this Opinion is to propose to the Commission an update of the current regulations on flight and duty time limitations and rest requirements (hereinafter 'FTL') for commercial air transport (hereinafter 'CAT') operations with aeroplanes as laid down in Subpart Q of Regulation (EC) 1899/2006, also known as *EU-OPS*
2. This Opinion also includes a proposal for common EU regulations on areas so far regulated at national level in accordance with Article 8 of EU-OPS, namely:
 - a) Split duty;
 - b) Rest compensating time zone differences;
 - c) Reduced rest arrangements;
 - d) Extension of flight duty period due to in-flight rest; and
 - e) Standby other than airport standby.
3. This proposal includes a number a safety improvements and clarifications to the existing regulation.
4. The proposed Implementing Rules (hereinafter 'IR') include the following safety improvements:
 - Improvement of the definition of 'acclimatised' taking better account of the impact of time zone differences;
 - Improved protection against cumulative fatigue through rolling limit of 1 000 hours of flight time in 12 consecutive months and additional limit of 110 duty hours per 14 days;
 - Improved protection against cumulative fatigue through prolonged extended recovery rest periods twice per month;
 - Improved protection against cumulative fatigue through additional rest requirements to compensate for disruptive schedules;
 - Improved protection against transient fatigue on night flights by expanding the window during which the FDP is reduced to 11 hours from 17:00 to 05:00.
5. The proposed IR includes the following clarifications:
 - Calculation of the basic maximum FDP through a table rather than a formula, this having raised different interpretations so far;
 - Definition of minimum standards for accommodation during airport standby;
 - Clarification of the rules governing commander's discretion reflecting the Air Safety Committee's interpretation of OPS 1.1120.
6. For those areas currently regulated at national level under Article 8 of EU-OPS (see paragraph 2 above), the European Aviation Safety Agency (hereinafter 'the Agency') proposes to use Certification Specifications as provided by Article 22 of the Basic Regulation¹. Operators may deviate from Certification Specifications by applying an individual flight time specification scheme provided it is approved by the Member State

¹ Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.03.2008, p. 1)

and after positive assessment by the Agency. The use of Certification Specifications will provide the necessary flexibility already recognised by the use of Article 8 under EU-OPS, but will ensure a much improved level playing field by requiring the Agency to assess all proposed deviations.

7. Beyond the improved level playing field, the Certification Specifications will introduce a number of safety improvements:
 - Reduction of the maximum FDP at the less favourable time of the day from 11 hours 45 to 11 hours.
 - Extension due to in-flight rest to be based on the type of rest facility on board.
 - Extension due to in-flight rest in economy seats not allowed.
 - Split duty provisions rely on defined minimum standards for accommodation and suitable accommodation.
 - Mitigation against the effects of alternating east-west rotations.
 - Standby other than airport standby duration limited to 16 hours.
 - Clear requirements on the quality and type of standby facilities at the airport.
 - Maximum combined duration of airport standby plus FDP of 16 hours unless other mitigating measures are foreseen.
 - Reduced rest provisions protect an 8-hour sleep opportunity.
8. This proposal takes full account 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.
9. Once this rule is in place it is crucial to monitor if the objectives are indeed achieved in an effective and efficient manner. It is also necessary to ensure that any subsequent external developments which may require a reassessment of these objectives are identified. It is therefore proposed to put in place a programme of work on pilot fatigue and performance. Such a programme would include gathering data on a long term basis, monitoring the impact of the new rules, assessing the effectiveness of fatigue management within the industry and researching specific issues as appropriate. Research subjects would include, but might not be limited to:
 - the impact of duties of more than 13 at the more favourable time of the day;
 - the impact of duties of more than 10 hours at the less favourable time of the day;
 - the impact of duties of more than 11 hours for crew members in an unknown state of acclimatisation;
 - the possible impact of a high level of sectors (>6) on crew alertness; and
 - the impact of disruptive schedules on cumulative limits.
10. Finally, this proposal has been established further to two rounds of extensive public consultation, with the support of a group of experts representing Member States, Air Operators and Flight and Cabin Crew association and in consultation with three independent scientific experts. Although it has not been possible to reach full consensus on all issues, this process allows the Agency to state that its proposal reflects the majority view of experts and affected stakeholders.

I. General

Background

11. The purpose of this opinion is to propose the Commission to amend Article 2 and Article 8 of Commission Regulation (EC) XXX/2012, Annex II (hereinafter Part-ARO) and Annex III (hereinafter Part-ORO) of Commission Regulation (EC) No XXX/2012 and to assist the Commission in establishing IR on FTL for Commercial Air Transport CAT with aeroplanes. The scope of this rulemaking activity is outlined in the Terms of Reference (hereinafter ToR) of rulemaking task OPS.055², which is included in the Agency's 2010–2013 Rulemaking Programme and is described in more detail below. Air taxi operations by aeroplane, emergency medical services by aeroplane and single pilot aeroplane operations have been excluded from the scope of this Opinion and are being addressed in different rulemaking tasks (RMT.0346, RMT.0429 and RMT.0430).
12. The Opinion has been adopted, following the procedure specified by the Agency's Management Board³, in accordance with the provisions of Article 19 of the BR.
13. The proposed rules have taken into account the development of European Union and International law as set out in the objectives of Article 2 of the Basic Regulation. The proposed rules are compliant with ICAO Standards and Recommended Practices.
14. The current legal framework for FTL is laid down in Subpart Q⁴ of EU-OPS. Harmonised rules ensure a minimum safety level by establishing a set of legally binding minimum requirements. Under Subpart Q there are however several cases where different rules apply in different Member States for the following reasons:
 - Recital 7 of the same regulation refers also to a so-called non-regression clause which authorises Member States to maintain legislation which contains provisions more favourable than those laid down in Regulation (EC) 1899/2006 and to retain or conclude collective labour agreements which provide for FTL provisions more protective than Subpart Q.
 - Recital 11 of Regulation (EC) 1899/2006 highlights that Member States may apply national provisions on FTL as long as they are below the maximum limits and above the minimum limits laid down in Subpart Q.
 - Certain elements of FTL are not covered by Subpart Q, namely provisions for the extension of an FDP due to split duty, provisions for the extension of an FDP due to in-flight rest, rest requirements to compensate the effects on crew members of time zone differences, reduced rest arrangements and standby provisions. For those, Article 8 (4) of Regulation (EC) 1899/2006 allows Member States to adopt or maintain provisions until Community rules are established.
15. The European Parliament and Council when adopting Regulation (EC) No 1899/2006 specifically requested the Agency to assist the Commission in the preparation of regulatory proposals for the modification of the applicable technical provisions of Subpart Q of EU-OPS.

² [http://www.easa.eu.int/rulemaking/docs/tor/ops/EASA-ToR-OPS.055\(a\)_OPS.055\(b\)-00-20112009.pdf](http://www.easa.eu.int/rulemaking/docs/tor/ops/EASA-ToR-OPS.055(a)_OPS.055(b)-00-20112009.pdf).

³ Decision of the Management Board concerning the procedure to be applied by the Agency for the issuing of Opinions, Certifications Specifications and Guidance Material (Rulemaking Procedure). EASA MB 08-2007, 13.06.2007.

⁴ Subpart Q – Flight and Duty Time Limitations and rest requirements of Annex III of Commission Regulation (EC) No 859/2008 of 20 August amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane.

16. The ToR of Rulemaking Task OPS.055 were published on 20 November 2009 and required to address the following:
- to review the flight and duty time limitations and rest requirements specified in Subpart Q;
 - to address those areas/points in EU-OPS Subpart Q currently subject to national provisions in accordance with Article 8(4) of Council Regulation (EEC) No 3922/91 (e.g. extended FDPs with augmented flight crew, split duty, time zone crossing, reduced rest and standby); and
 - to take account of all relevant recent and publicly available scientific and/or medical studies/evaluations and operational experience, as well as the conclusions drawn from the discussions on Subpart Q by the Air Safety Committee, relevant comments to NPA 2009-02, experience gained in requests for derogations to Subpart Q, any amended ICAO SARPS, and international developments. In particular, the outcome of the ICAO Fatigue Risk Management System Task Force was to be considered.

Article 8 provisions

17. With the adoption of Regulation (EC) No 1899/2006, the legislator introduced 'Annex III' *Common technical requirements and administrative procedures applicable to commercial transportation by aircraft*, containing Subpart Q - flight and duty time limitations and rest requirements. Recital (7) of this Regulation explains its aim as regards FTL: '*to provide harmonised safety standards of a high level, including in the field of flight and duty time limitations and rest requirements*'.
18. The complexity of the issue did however not permit to achieve harmonisation of all FTL elements. Following the principles of subsidiarity and proportionality as defined in Article 5 of the Treaty establishing the European Community⁵, Article 8(4) of Council Regulation (EEC) No 3922/91 allowed Member States to '*adopt or maintain provisions relating to:*
- OPS 1.1105 point 6 – extended FDP (split duty);
 - OPS 1.1110 point 1.3 rest compensating time zone differences;
 - OPS 1.1110 point 1.4.1 –reduced rest arrangements;
 - OPS 1.1115 – extension of flight duty period due to in-flight rest; and
 - OPS 1.1125 point 2.1 – other forms of standby.
- until Community rules based on scientific knowledge and best practices are established*'.
19. The FTL elements listed above address operational needs that may vary in the different Member States, depending on their geographical situation, the type of air transport infrastructure, etc. This flexibility is needed and itself not in contradiction with the harmonisation of *safety standards of high level*.
20. Recital (11) of the Basic Regulation (hereinafter 'BR') suggests '*provisions should also be made for reaching an equivalent safety level by other means.*'
- a- Use of Certification Specifications
21. Article 22 point 2 of the BR proposes Certification Specifications (hereinafter 'CS') for flight time limitation as the regulatory tool. This will allow Member States to approve individual solutions addressing specific operational needs.
22. For FTL elements that are currently fully harmonised under Subpart Q, the Agency proposes a set of IR. On the other hand for the FTL elements listed above, having been under Article 8 subject to Member States' discretion, the Agency proposes a set of CS.

⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:FULL:EN:PDF>.

These are based on a combination of Member States' best practices and scientific principles.

23. The use of CS will provide the necessary flexibility already recognised by the use of Article 8 under EU-OPS. Furthermore, it will ensure a much improved level playing field by requiring the Agency to assess all proposed deviations under the Article 22 process.

b- Article 22 process

24. Article 22 allows Member States to approve *individual flight time specification schemes* which deviate from the CS initially issued by the Agency. These individual proposals are then assessed by the Agency on the basis of a scientific and medical evaluation. Such individual schemes may only be approved by Member States as notified if the Agency has no objections. Should the Agency propose any changes to the scheme, these should be discussed with the Member State. An approval may be granted if the proposed changes are acceptable to the Member State. Only if the Member State disagrees with the Agency's conclusions concerning an individual scheme, the issue shall be referred to the Commission to decide whether the scheme complies with the safety objectives of the BR.
25. In order to assess these individual flight time specification schemes, the Agency envisages setting up a panel of experts from Member States, Operators, Crew associations and the Agency. Experts will be selected on the basis of their scientific and medical knowledge and/or operational experience in relation with FTL.

Scientific assessment

26. The European Parliament and the Council when adopting Regulation (EC) No. 1899/2006 specifically requested EASA to conduct a scientific and medical evaluation of Subpart Q [ref. Regulation (EC) No 3922/91 new Article 8(a)] and assist the Commission on the preparation of regulatory proposals, if required:

'By 16 January 2009, the European Aviation Safety Agency shall conclude a scientific and medical evaluation of the provisions of Subpart Q and, where relevant, of Subpart O of Annex III.

Without prejudice to Article 7 of Regulation (EC) No 1592/2002 of the European Parliament and of the Council of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, the European Aviation Safety Agency shall assist the Commission in the preparation of proposals for the modification of the applicable technical provisions of Subpart O and Subpart Q of Annex III.'

27. In January 2007 the Agency set up an advisory group on flight time limitations to advise the Agency on:
- identifying any key points of disagreement between stakeholders on the provisions of Subpart Q;
 - developing terms of reference for the tender including unbiased questions to be put to the panel of experts, the methods and frequency of reporting by the consultant, and the format of the final report;
 - establishing criteria for the selection of the experts that will ensure that the highest standards of independence, expertise competence and professionalism are met;
 - choosing the appropriate consultant to carry out the study in accordance with the terms of reference, using the above selection criteria; and
 - the monitoring of the study.
28. The scientific FTL experts who completed the said evaluation submitted their report, known as the 'Moebus report', to the Agency on 11 November 2008. The related report included various conclusions that could broadly be described as 'recommendations, precautions, advice, guidance, questions and need for further scrutiny or dedicated

research'. This report triggered discussions from different interest groups with contradicting views about its conclusions.

29. When developing NPA 2010-14, the Rulemaking Group set-up by the Agency reviewed not only the Moebus report, but also a number of relevant publicly available scientific studies⁶. Furthermore, following the request of stakeholders, the provisions of NPA 2010-14 have been scientifically assessed with the support of three independent scientists during the public consultation process.
30. During the analysis of the scientific expertise submitted, it has however become more and more apparent that a literature-based scientific review of any FTL scheme has its limits. Critical scrutiny of the Moebus report had already shown that findings from a statistical analysis of accident data stemming from accidents or incidents that had occurred under different rest requirements are not necessarily applicable to the European aviation industry with its historically robust rest requirements.
31. Due to the strong correlation of different FTL elements, a quantitative assessment of a new set of rules before its implementation is impossible. Human fatigue is a highly complex phenomenon. Therefore, as soon as baseline parameters in an assessed scheme, i.e. rest requirements, differ from a study's operational environment, precise quantitative recommendations cannot be taken literally. Consequently, a literature-based scientific review can only serve to identify trends and highlight areas of special concern and not to prescribe minima or maxima of FTL core elements.
32. A complete scientific study, including data collection in the operational environment would nonetheless be useful to draw reliable conclusions on the impact of a specific FTL element. Such a study can however only deliver meaningful results if conducted *ex-post*. The new rule would have to be fully implemented before setting up such a study. The Regulatory Impact Assessment of this Opinion elaborates further on a proposal to put in place a programme of work on aircrew fatigue and performance to review the effectiveness of the proposed provisions.

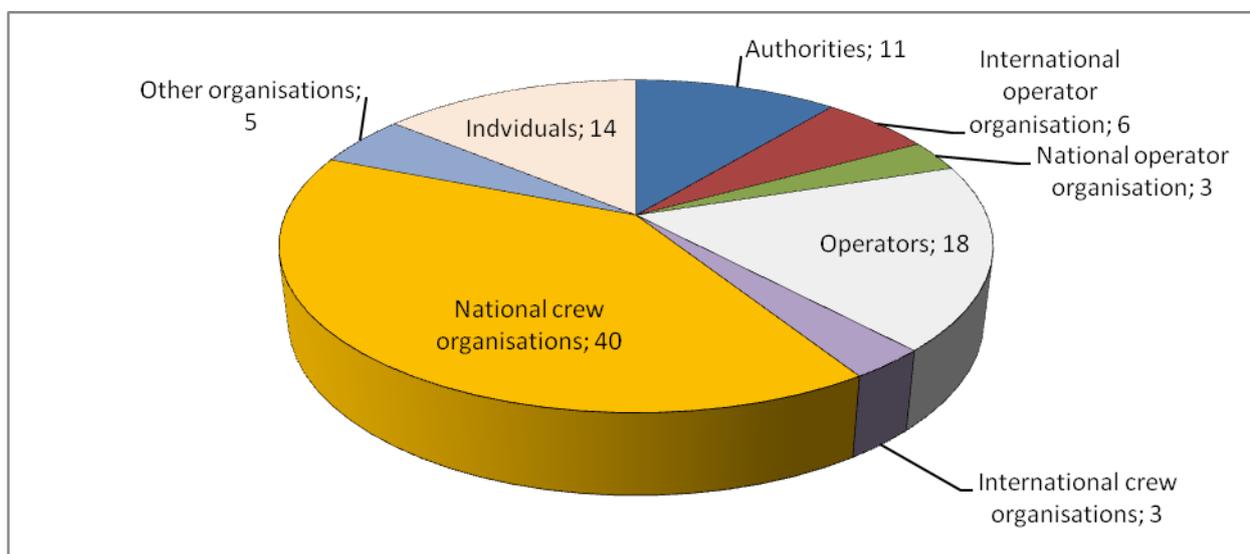
II. Consultation

33. This opinion is based on Notice of Proposed Amendment (NPA)2010-14⁷ that contained the draft opinion for a Commission Regulation establishing the IR on flight and duty time down limitations and rest requirements for commercial air transport (CAT) with aeroplanes was published on the Agency website on 20 December 2010.
34. By the closing date of 20 March 2011, the Agency had received 49 819 comments from individuals and organisations, including national authorities, professional organisations and private companies.
35. All comments received on the NPA 2010-14 were reviewed, analysed for their relevance to the proposed changes and summarised per rule paragraph. Comment summaries, related responses and the proposed revised rule text were incorporated into a Comment-Response Document (CRD).
36. The draft CRD text was discussed with the Review Group during seven meetings between April 2011 and November 2011. The composition of the Review Group was based on the composition of the initial Rulemaking Group as regards the distribution of group members from different stakeholder groups. The three independent scientists, contracted by the Agency to provide their comments on some of the NPA 2010-14 elements, were invited to present their findings at one of those meetings.

⁶ Listed under 9.1 *Bibliography* of the Regulatory Impact Assessment to this Opinion.

⁷ See Rulemaking Archives at http://www.easa.europa.eu/ws_prod/r/r_archives.php.

37. During a special meeting of the Advisory Group of National Aviation Authorities (AGNA) convened on 24 October 2011 in accordance with Article 7 of the Rulemaking Procedure, representatives of National Aviation Authorities (NAA) provided guidance to the Agency on the following 12 items:
- the maximum allowable daily Flight Duty Period (FDP) at the most favourable time of the day;
 - the maximum allowable daily FDP at night;
 - the need to keep the 1-hour extension versus its integration into the basic maximum FDP;
 - the reduction of the maximum allowable daily FDP for more than 6 sectors (beyond Subpart Q);
 - the impact of the Window Of Circadian Low (WOCL) on the extension due to in-flight rest;
 - the impact of the number of sectors on the extension due to in-flight rest;
 - the possibility of using economy seats for in-flight rest;
 - the need to put an additional cumulative duty limit every 14 days to mitigate cumulative fatigue;
 - the need for extended recovery rest periods to compensate for irregular patterns of work;
 - the added value of reduced rest provisions as compared to split duty;
 - the maximum duration of home standby and related mitigating measures; and
 - how to best integrate the need for operational flexibility in this proposal.
38. Based on this extensive consultation with authorities, associations and operators, a CRD was published on the Agency's web site on 18 January 2012 a list of all persons and/or organisations that had provided comments and the comments were published with this CRD. The reaction period ended on 19 March 2012.
39. The Agency received reactions to the CRD from 100 entities, including NAAs, organisations and individuals. The following figures provide an overview of the reactions. In addition, the Agency held a meeting with the Review Group on 15 and 16 May 2012 to discuss the issues that had appeared to be of special concern after the evaluation of the CRD reactions.

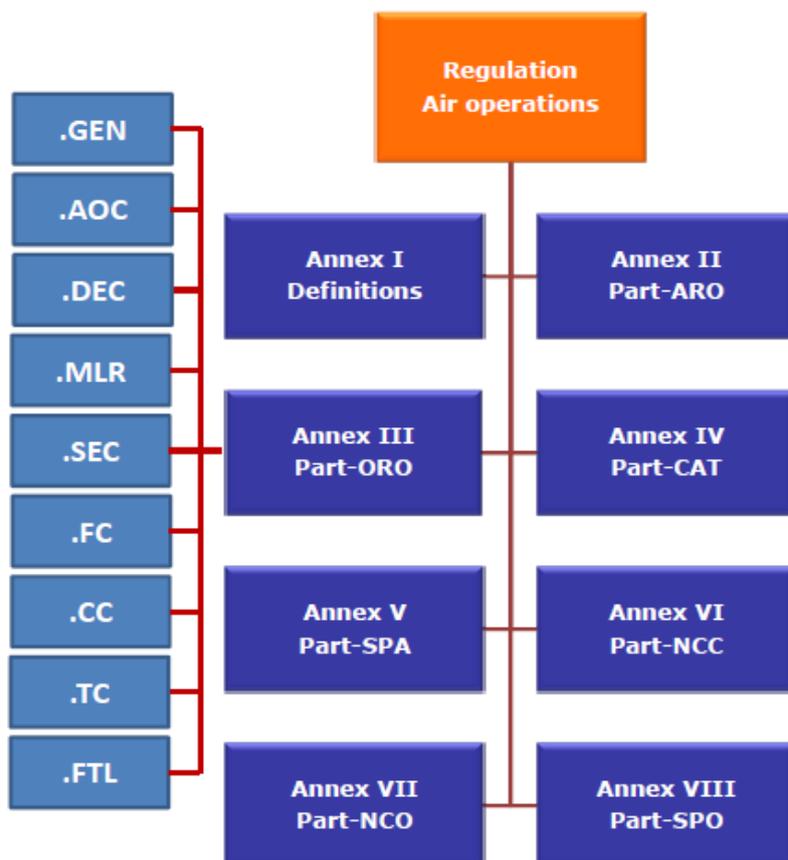


III. Content of the Opinion and structure of the proposed rule

40. This Opinion consists of the following documents:

- Amendment to the Cover Regulation on air operations;
- New Subpart FTL of Annex III, Part-ORO (Organisation requirements); and
- Amendment to Section 1 – Certification of commercial air transport operators, Subpart OPS (Air operations) of Annex II, Part-ARO (Authority requirements).

41. The following table provides an overview of the Annexes under the Regulation for air operations.



42. The regulatory proposals for IR establishing flight and duty time limitations and rest requirements for CAT operations with aeroplanes are contained in Subpart FTL of Annex III (Part-ORO) of Commission Regulation XXX/2012.

Cover regulation on Air operations

43. The Cover Regulation on 'Air Operations' defines the general applicability of the Annexes (the Parts it covers) and proposes transition measures in the form of the exclusion of certain operations, such as air taxi operations by aeroplane, emergency medical service operations by aeroplane, and single pilot aeroplane operations. The Cover Regulation is prepared as an amending Regulation, is based on the initial OPS Cover Regulation as endorsed by the EASA Committee for the CAT package (Opinion 04/2011)⁸, offers a

⁸ [Draft Regulation on Air Operations.](#)

definition for 'air taxi operation' and specifies the date of entry into force of the amending Regulation.

Subpart FTL Section 1 General

44. Subpart FTL, Section 1 of Annex III (Part-ORO) establishes general requirements. For the time being, they are applicable to CAT operations only. Subsequent rulemaking tasks for other types of operations will review the content of these provisions concerning their applicability to other types of operations. The IR of this section:

- describe the scope of the regulation;
- define most commonly used terms and expressions;
- specify operators' and crew members' responsibilities; and
- establish the objectives and contents of Fatigue Risk Management (FRM).

Subpart FTL Section 2 Commercial Air Transport Operators

45. Subpart FTL, Section 2 of Annex III (Part-ORO) includes specific provisions applicable to CAT operators. In this section, the obligation to implement and maintain flight time specification schemes which are appropriate to the type(s) of operation performed is outlined for commercial air transport operators. These flight time specification schemes shall be approved by the competent authority before being implemented.

46. To establish compliance with the BR and Subpart ORO.FTL, operators may use the applicable Certification Specifications (CS) issued by the Agency. Deviation from these CS when establishing an individual flight time specification scheme is possible under Article 22 (2) of the BR only if the operator provides the competent authority with an assessment demonstrating that the requirements of the BR and of this Subpart are met.

47. This section specifies the core FTL elements as known from EU-OPS Subpart Q listed below:

- home base;
- flight duty period (FDP) without extensions;
- the possibility to allow a different reporting time for flight crew and cabin crew;
- the conditions under which a FDP may be extended and the limits of such extensions including also the possibility to extend a FDP due to break on the ground;
- cumulative limits of flying hours and duty time;
- standby;
- rest periods;
- how nutrition of crew members is ensured; and
- requirements for record keeping.

Annex II Part Authority Requirements for Air Operations Subpart OPS Air Operations

48. A proposed amendment to Part-ARO suggests the insertion of two new articles addressing:

- the approval of individual flight time specification schemes proposed by commercial air transport operators; and
- the determination of the disruptive schedules as 'early type' or as 'late type' for all commercial air transport operators under its oversight.

Draft Certification Specifications FTL1, Commercial Air Transport by Aeroplane – Scheduled and Charter Operations

49. Many aspects of FTL had been left to Member States' discretion under Article 8 (4) of Council Regulation (EEC) No 3922/91. Those elements are established in draft Decision 201X/XXX/R, CS FTL 1 and reflect Member States' best practices, operational experience taking into account scientific principles and knowledge. These aspects are:
- flight duty period – special conditions for consecutive night duties;
 - flight duty period – extension of FDP without in-flight rest;
 - flight duty period – extension of FDP due to in-flight rest;
 - split duty;
 - different forms of standby;
 - minimum rest period to compensate for disruptive schedules;
 - minimum rest period to compensate for time zone differences; and
 - reduced rest.
50. To give the full picture of the protection against fatigue that will be achieved by the IR, the draft Decision containing CS, AMC and GM will be made available on the Agency's website. The full significance of the proposed IR can for some aspects of FTL only be understood in connection with the corresponding CS.

IV. Overview of reactions and explanation of the rules

General

Scope

51. Reactions to the cover regulation focussed on the exclusion of air taxi operations and the scope of such operations.
52. The definition for air taxi operations as proposed in the cover regulation introduces the following two conditions that have to be met by CAT operations by aeroplane to be classified as air taxi operations:
- non-scheduled on demand; and
 - carried out with an aeroplane with a maximum operational passenger seating configuration (MOPSC) of 19 or less.

The draft IR contained in this Opinion and the corresponding CS 1 shall not apply to air taxi operations. Some stakeholders felt however, that air taxi operations should follow the same rules as other CAT operations in accordance with Subpart Q.

53. Single pilot operations, emergency medical service operations by aeroplane and helicopter operations are also excluded from the scope of this Opinion and shall be addressed in separate rulemaking tasks as reflected in the Agency's 2012 – 2015 Rulemaking Programme⁹.
54. The IR, CS, Acceptable Means of Compliance (AMC) and Guidance Material (GM), as appropriate, for the so far excluded operations will be published later as an outcome of rulemaking tasks RMT.0346, RMT.0429 and RMT.0430.

Transition measures

⁹ <http://easa.europa.eu/rulemaking/docs/programme/2012-2015/RMP%202012-2015%20and%20inventory.pdf>.

55. Transitions measures in the form of 'opt-outs'¹⁰ have been suggested by some stakeholders. Provided the time between entry into force and application is long enough to give operators the possibility to adapt to the new requirements, the Agency believes that transition measures in form of an application date one year after entry into force are more appropriate. Taking account of the possibly more significant negative cost impact on Charter Operators as identified by the regulatory impact assessment to this opinion, the Agency proposes that Member States may choose to delay the application of the paragraph describing the conditions under which an FDP may be extended due to in-flight rest for one more year under an opt-out.

Flight time specification schemes

56. Subpart FTL Section 2 Commercial Air Transport Operators includes the obligation for commercial air transport operators to implement and maintain flight time specification schemes which are appropriate for the type(s) of operation performed. These flight time specification schemes shall be approved by the competent authority before being implemented.
57. To establish compliance with the Basic Regulation and this Subpart, operators may apply the applicable CS issued by the Agency. Deviation from these CS when establishing an individual flight time specification scheme is possible under Article 22 (2) of the BR, but only if the operator provides the competent authority with an assessment demonstrating that the requirements of the BR and of this Subpart are met.
58. Section 2 also develops the core FTL elements as known from EU-OPS Subpart Q.
59. The following amendments to Annex II – Authority Requirements for Air Operations (Part-ARO) to the draft Commission Regulation on Air Operations – OPS are proposed:
- the competent authority shall approve flight time specification schemes proposed by operators when compliance with this Regulation has been demonstrated;
 - the competent authority shall apply the procedure established in Article 22 of the Basic Regulation whenever a flight time specification scheme deviates from the applicable CS issued by the Agency; and
 - the competent authority shall determine the disruptive schedules as 'early type' or as 'late type' for all commercial air transport operators under its oversight.

Technical requirements

Definitions

60. Following stakeholders' reactions, certain definitions have been refined and additional definitions are suggested to improve the clarity of the IR.
61. Definitions are included in Subpart FTL Section 1 General. They are applicable to all operators.
62. The definition of '**acclimatised**' maintains that a crew member remains acclimatised for 48 hours after departure as known from Subpart Q, but instead of making reference to the home base time, it makes reference to the newly defined term 'reference time'. The further state of acclimatisation is described in a table acknowledging the fact that a crew member can either be still acclimatised to the local time of the departure time zone, acclimatised to the destination time zone or in an unknown state of acclimatisation when the body clock is located somewhere in between the local time of the departure point and the local time of the destination.

¹⁰ An opt-out is a type of transition measure that leaves to the Member States the choice to postpone the implementation date of a certain provision, up to a certain time limit defined by law.

63. Following stakeholders' reactions, this new definition of '**reference time**' has been introduced to simplify the calculation of the maximum FDP for a crew joining crew members acclimatised to neighbouring time zones.
64. Further additional definitions have been introduced:
- '**Accommodation**', which is used to define minimum standards for facilities that have to be provided to crew members on airport standby and during a split duty;
 - '**Operating crew member**' which is used in the IR on cumulative flight time and duty limits;
 - '**Rest facility**', which defines minimum criteria and the objective of the amenities that shall be provided to crew members for the purpose of in-flight rest;
 - '**Sector**', which clarifies that take-off and landing must be included in an operation in order to count as a sector; and
 - '**Suitable accommodation**', which is used to define minimum standards for facilities that have to be provided to crew members under certain circumstances during split duty and during minimum rest at home base between two flights crossing more than four time zones.
- All these shall remove ambiguity and hereby improve the level of harmonisation.
65. Three definitions have been included to properly explain additional rest requirements to compensate the cumulative effects of duties involving time zone transitions or operating during the most unfavourable time of the day:
- '**Eastward-Westward and Westward-Eastward transition**' refers to rotations with extensive time zone transitions in opposite direction;
 - '**Rotation**' refers to a series of consecutive of duty periods, flight duty periods and rest periods out of home base. This definitions is needed to understand the rest requirements and operator responsibilities attached to operations involving extensive time zone transitions; and
 - '**Disruptive schedule**' refers to those instances where an FDP or a combination of FDPs disrupts a crew member's sleep opportunity during the optimal sleep time window.
66. Following stakeholder reactions the concept of disruptive schedules of '**early type**' and of '**late type**' has been introduced in the definition of disruptive schedules. The definitions of 'early start', 'late finish' and 'night duty' used in the CRD are based on findings obtained from studies of aircrew based in the United Kingdom. One of the authors¹¹ of these studies recognized that cultural differences related to the notion of *early* and *late* could require some adjustment to the definitions in other European States. This new concept requires Members States to determine if disruptive schedules for all commercial air transport operators under its oversight are 'early type' or 'late type' (see also paragraph 145.).
67. The initially proposed time windows are maintained for disruptive schedules of 'late type'. In comparison with the unchanged definitions for disruptive schedules of 'late type', if a Member State has chosen disruptive schedules for its operators to be of 'early type', an FDP ending at 23:00 is already considered a late finish. Following the same logic the time window during which an FDP is an 'early start', ends at 05:59 instead of 06:59. The definition of 'night duty' is the same for both, 'early type' and 'late type'.

¹¹ [CRD 2010-14](#) Appendix III. Scientists Reports: Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations (FTL) and to provide guidance and advice to the FTL Review Group - Final Report - Mick Spencer.

68. **Standby** provisions are currently regulated by Member States. The three definitions that have been included relate to standby provisions and are based on Member States' best practices or develop the 'standby' concept as known from Subpart Q:
- **'Airport Duty'** refers to the status of immediate availability to receive an assignment; and
 - **'Reserve'** refers to the status during which a crew member shall be available to receive an assignment with at least 10 hour notice; and
 - **'Standby'**, stemming originally from Subpart Q, has been refined and distinguishes now between 'airport standby' and 'standby other than airport standby'.
69. Finally, in the anticipation of the future rulemaking task on such operations, a definition for **'ultra-long range operations (ULR)'** has been included.

Operator responsibilities

70. The operator responsibilities described in ORO.FTL.110 either stem directly from the paragraph on operators' responsibilities in Subpart Q or are indirectly derived from the requirements directed to the operator in Subpart Q.

Crew member responsibilities

71. The crew member responsibility to not perform duties on an aircraft if he/she knows or suspects that he/she is suffering from fatigue as referred to in 7.f. and 7.g. of Annex IV of the BR is already reflected in CAT.GEN.MPA.100 of Regulation XXX/2012. A reference to this paragraph has been introduced additionally in Section 1 also highlighting that crew members shall make optimum use of the opportunities and facilities for rest and that they shall plan and use rest periods properly.

Fatigue Risk Management (FRM)

72. ICAO has defined a Fatigue Risk Management System as *'a data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.'* According to ICAO's FRMS Manual for Regulators, FRM applies principles and processes from safety management and seeks to proactively identify opportunities to improve operational processes and reduce risk, as well as identifying deficiencies and adverse events. The structure of FRM is modelled on the SMS framework.
73. ORO.GEN.200 of Regulation XXX/2012 includes a requirement for an integrated Management System. The Agency considers that fatigue risk management (FRM) should be integrated in an organisation's management system as an integral part of safety management. This view is reflected in ORO.FTL.120. This paragraph describes the objective of the FRM, namely to ensure compliance with the Essential Requirements 7.f., 7.g. and 8.f. of Annex IV of the BR. If required, the FRM shall be described in the Operations Manual. The requirements for the FRM and its components are compliant with the corresponding ICAO Annex 6.
74. The explicit requirement for FRM is in ORO.FTL.210 in Section 2 of Subpart FTL. FRM is compulsory if an operator wishes to reach the maximum FDP of 12 hours for crew members in an unknown state of acclimatisation and in draft CS.FTL.1.235 3 allowing the use of reduced rest arrangement only under FRM. The draft CS.FTL.1.235 2(a) also instigates operators to 'monitor' the effect of rotations and combinations of rotations on crew fatigue and draft AMC1 ORO.FTL.110(b) advises operators to 'actively manage' FDPs of more than 10 hours overlapping or encroaching the period between 22:00 and 04:00.
75. The use of FRM is however encouraged and FRM might also be a useful tool to demonstrate compliance with the responsibilities established in ORO.FTL.110, especially point (b). This point obliges operators to ensure that FDPs are planned in a way that

enables crew members to remain sufficiently free from fatigue so that they can operate to satisfactory level of safety under all circumstances.

Fatigue management training

76. In line with scientific recommendations¹² a new requirement in Section 2 makes initial and recurrent fatigue management training for crew members, rostering and concerned management personnel mandatory for CAT operators. A safety improvement is to be expected by this measure, even for operations completely compliant with prescriptive FTL, because fatigue management training will increase fatigue hazard awareness throughout the entire management structure of commercial air transport operators.

Home base

77. The operator responsibility to assign a home base to each crew member stems from Subpart Q and is reflected in ORO.FTL.200. Neither the definition of home base nor this IR specify if the home base should be a single airport location. Since however the single airport home base concept is without a doubt used by the large majority of operators, the provisions in draft CS FTL.1.200 take note of the concern that changing home base and operating out of more than one airport within a multiple airport system creates additional fatigue and specify that the home base should be a single airport location assigned with a high degree of permanence. In case of a change of home base, the draft CS foresees prolonging the extended recovery rest prior to starting duty at the new home base to once 72 hours, including 3 local nights. The travel time between the old and the new home base shall also be counted. Therefore it is required that travelling time between the former and the new home base is either positioning or FDP.
78. The need for some operators to use a multiple airport system as a home base is nonetheless acknowledged by the choice of regulatory tool. Placing this provision in CS provides flexibility through the deviation process described in Article 22.2 of the BR.

Flight Duty Period (FDP)

a- Maximum flight duty period — Use of tables

79. The basic maximum FDP for acclimatised crew members is reflected in an easy to apply table. Specifying the maximum FDPs in tables removes the ambiguity for crew members and other personnel involved in day to day operations that results from the interpretation of a legal paragraph describing a formula with several variables, namely the FDP reduction due to WOCL encroachment and the FDP reduction due to the number of sectors. This approach is supported by the majority of stakeholders.

b- Maximum flight duty period — Basic values

80. The values for basic FDP reflected in this table have been derived from Subpart Q. Although the basic value of 13 hours for FDPs starting at the most favourable time of the day had initially been the result of social negotiations during the drafting process of Subpart Q, it is scientifically supported¹³. There are even references in scientific literature in this field stating that FDPs of 14 hours duration are safe at the most favourable time of the day. The basic value of 13 hours is supported by the majority of stakeholders.

c- Reduction of FDP due to WOCL and number of sectors

¹² [CRD 2010-14](#) Appendix III. Scientists Reports: Provision of Scientific Expertise to Submit an Assessment of the NPA on Flight Time Limitations (FTL) and to Provide Guidance and Advice to the FTL Review Group – Final Report – Alexander Gundel.

¹³ [CRD 2010-14](#) Appendix III. Scientists Reports: Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations (FTL) and to provide guidance and advice to the FTL Review Group - Final Report - Mick Spencer.

81. The scientific review¹⁴ of NPA 2010-14 has suggested expanding the time window for operations encroaching the night hours. This recommendation has been followed and is reflected in the basic maximum FDP table. The time window during which the basic maximum is limited to 11 hours has been extended. It encroaches now the 12-hour period between 17:00 and 05:00. This basic maximum FDP value for the most unfavourable starting times is increased in steps to reach the 13-hour maximum for starting times between 06:00 and 13:29. Between 13:30 and 16:59 the maximum FDP is then again decreased in steps.
82. Following the well-known Subpart Q approach, the basic maximum FDP table reduces the maximum FDP by 30 minutes for each sector from the third sector onwards. Although the review of scientific literature does not indicate precise values translating the impact on fatigue of sectors beyond the fourth, the Agency proposes continuing the 30-minute sector reduction beyond the sixth sector to reach a minimum maximum FDP of 9 hours until further scientific studies are carried out. This improvement of existing provisions for sector reduction is supported by the majority of stakeholders.
- d- FDP table for unacclimatised crew
83. A different table establishes the maximum daily FDPs for crew members in an unknown state of acclimatisation. The limit is set to 11 hours for a 2-sector operation, just as in the table for acclimatised crew members, a reduction of 30 minutes per sector is applied from the third sector onwards. This 11-hour limit is based on the assumption that a crew member could possibly be starting the assigned FDP at the most unfavourable time of the day according to his/her individual body clock.
84. A third table sets the maximum FDPs for crew members in an unknown state of acclimatisation to 12 hours if the operation is monitored under FRM. The underlying logic here is that depending on the specific circumstances of such an operation (i.e. optimal timing of rest opportunities etc.) a crew member could very well be fully rested at a favourable time of the day according to his/her body clock when reporting for such a duty although he/she is in an unknown state of acclimatisation. This instance however, would need continuous monitoring, therefore FRM is mandatory for operators wishing to benefit from this provision.
- e- Extended FDP
85. The description of general conditions under which an FDP may be extended without the use of in-flight rest, are reflected in ORO.FTL.205 (d) and resemble the conditions for extensions under Subpart Q. A user friendly table with maximum FDP values according to the starting time is included in the applicable draft CS. This table takes account of the scientific recommendation to limit FDP extension without additional mitigating measures to favourable starting times. The safety improvement here is that the CS only allows FDP extensions for starting times after 06:15. For 5-sector operations an extension is only allowed for reporting times before 14:30, for 3 and 4-sector operations for reporting times before 16:30 and for 1-2-sector operations before 19:00. This measure finds the support of all stakeholder groups except crew organisations who claim that the data drawn from few scientific studies indicate that the FDP limit for night flights should be set to 10 hours instead of 11.

¹⁴ [CRD 2010-14](#) Appendix III. Scientists Reports: Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations (FTL) and to provide guidance and advice to the FTL Review Group - Final Report - Mick Spencer; Final Report - Alexander Gundel; Final Report - Philippe Cabon.

86. In this context it might be worthwhile to mention that the studies¹⁵ that have been quoted to substantiate the demand for a maximum of 10 hours of FDP at night have been conducted under very specific operational environments and it is questionable if they are fully representative for the EU-OPS Subpart Q regulatory environment.

f- Additional limits for night duties

87. In addition to the limits above, consecutive night duties are limited to 4 sectors per duty and draft AMC to ORO.FTL.110 (b) advises operators to actively manage the fatiguing effect of FDPs of over 10 hours overlapping or encroaching the period between 22:00 and 04:00. This proposal emphasises the importance of assessing the impact on fatigue of each night duty assigned to an individual crew member not only by analysing duty length and reporting time, but also by considering other factors such as if the rest period before the night duty is optimal for achieving sleep in the circumstance of this particular roster etc.

88. This requirement in combination with mandatory FRM training will raise awareness amongst rostering personnel. It will also provide a tool to authorities to monitor if safety management principles are applied to the operator's rostering system.

g- Additional limits for early starts

89. It is commonly recognised that any duty curtailing the sleep opportunity during hours most conducive to restorative sleep (during the WOCL) will have effects on transient and cumulative fatigue. The transient effects of early starts are mitigated by the reduction of the maximum FDP for early starts. It is also accepted that transitions from late to early duties and vice versa are especially fatiguing.

90. The insight gained from the review of existing scientific literature during the scientific assessment of NPA 2010-14 has not indicated that limiting the number of early starts in one duty block would actually have a positive effect on fatigue levels. Therefore, and in order to avoid encouraging operators to roster fatiguing duty transitions, the Agency has chosen not to limit the number of early starts in one duty block. Instead, the draft CS FTL.1.235 requires additional rest for crew members performing 4 or more early starts between 2 extended recovery rest periods and for duty transitions from late finish/night duty to early start.

91. This approach finds general stakeholder support and has been accepted to be a safety improvement.

h- In-flight rest

92. The proposed IR on maximum daily FDP with the use of extensions due to in-flight rest describes the aspects that shall be taken into account when specifying the conditions for these extensions in a flight time specification scheme, namely:

- the number of sectors flown;
- the minimum in-flight rest allocated to each crew member;
- the type of in-flight rest facilities; and
- the augmentation of the basic flight crew.

Extension of flight duty period due to in-flight rest being a so-called Article 8 provision, the Agency had to rely on the operational experience of the rulemaking group members, existing national provisions, stakeholder comments to NPA 2010-14, stakeholder

¹⁵ - Powell D, Spencer MB, Holland D, Petrie KJ (2008). Fatigue in two-pilot operations: implications for flight and duty time limitations. *Aviat. Space Environ. Med*, 79(11), 1047-1050.

- Spencer MB and Robertson KA (1999). The Haj operation: alertness of aircrew on return flight between Indonesia and Saudi Arabia. DERA Report No DERA/CHS/PPD/CR980207.

reactions to the corresponding CRD and existing scientific literature. The prescriptive elements have been described entirely in CS to allow for some flexibility provided an equivalent level of safety has been demonstrated.

93. The provisions are based to a large extent on the TNO¹⁶ report, the most comprehensive scientific examination of international literature and databases studying and analysing the quality of different in-flight rest facilities in relation to the yield in terms of sleep, alertness and performance.
94. The draft CS is not a direct transcript of the TNO report figures, but a transposition of its recommendations into practical terms. The rule describes the maximum daily FDP with the use of an extension due to in-flight rest as a function of the quality of the in-flight rest facility and how many additional pilots are on board. The proposed values take due account of the time that on average would have elapsed before the additional crew member(s) can use the cruise phase for their in-flight rest in a 3-sector FDP. Relatively more time is available for in-flight rest the longer the flight time in an FDP or in other words if fewer sectors are operated in one FDP. Therefore the FDP limits may be increased by up to one hour if one sector has a duration of over 9 hours continuous flight time and the FDP does not contain more than 2 sectors.
95. These limits are irrespective of the WOCL. This approach has been chosen in order to keep the rule simple and easy to implement. It is based on the operational experience of some operators which have used similar provisions for several years. More recently, some Member States have used this method under EU-OPS Article 8. Since in-flight rest during the night hours is more conducive to recuperative sleep, the Agency considers that it compensates for the greater extension that is applied to an FDP encroaching the WOCL.

i- In-flight rest — Facilities

96. The draft CS FTL.1.205 3 proposes solutions for all aspects listed above by firstly defining three types of in-flight rest facilities. The technical specifications of in-flight rest facilities that have been chosen for this draft CS are derived from the TNO report. The draft CS initially does not foresee the use of any alternative means to achieve an extension of the FDP due to in-flight rest. The fact that in-flight rest in tourist class seats is not credited, has been criticised by some stakeholders. It has been highlighted that some charter operations to holiday destinations outside the EU territory would become impossible or economically unviable with the proposed CS. Since it is possible that these operations would be taken over by third country operators, potentially exposing EU citizens to a higher risk than that related to in-flight rest in tourist class seats as currently used by many EU operators, the Agency suggests an additional transition period during which operators can adapt to the new requirement. However, the at this stage available data would not justify the use of tourist class seats for in-flight rest.

j- In-flight rest — Minimum duration

97. The draft CS on in-flight rest proposes limiting the possibility to use in-flight rest to extend the maximum FDP to operations of up to 3 sectors. The minimum *consecutive* duration of in-flight rest is set to be 90 consecutive minutes and 2 hours for those flight crew members at control during landing. For flight crew, there is no need to further define the duration of in-flight rest for each crew member. The time during cruise is divided, equally or not, in 3 if one additional pilot is used and in 2 if two additional pilots are necessary to achieve the planned FDP. This proposal is based on stakeholder input describing operational experience and existing national provisions.

k- In-flight rest — Cabin crew

¹⁶ Simons M and Spencer MB (2007). Extension of flying duty period by in-flight relief. TNO Report TNO DV 2007 C362, TNO Defence and Security, Soesterberg, the Netherlands.

98. Because the number of cabin crew is variable and there is no requirement to augment the cabin crew in operations with extended FDP due to in-flight rest, the approach chosen for flight crew FDP extensions due to in-flight rest could not be applied for cabin crew. Therefore a table which sets the minimum duration for each cabin crew member as a function of the duration of the FDP and the type of in-flight rest facility used has been included in the applicable CS. The values in this table are based on a scientific recommendation¹⁷, they are however more restrictive by putting a ceiling on extended FDPs that can be achieved with class 2 and class 3 in-flight rest facilities.
99. The minimum consecutive duration of in-flight rest for cabin crew members is set to be 90 minutes and the table takes the following considerations into account:
- any crew member shall have a total of 8 hours sleep opportunity in any 24 hours; and
 - 1 hour recuperative sleep shall credit for 2 hours of additional wakefulness.
100. The quantitative deviation from the values recommended in the TNO report for pilots, especially for long extensions, is reasonable because although it is acknowledged that cabin crew members have important responsibilities for the safety of the aircraft and its passengers, it is unlikely that they need to maintain the same level of alertness required by flight crew members in control of the aircraft during landing¹⁸.
- l- Unforeseen circumstances in actual flight operations — Commander's discretion
101. The general conditions and circumstances under which the commander shall be able to modify the limits on FDP and requirements for rest periods are derived from Subpart Q provisions for commander's discretion and remain within those well-known limits. Based on operational experience and stakeholder input, the existing rule has been refined and extrapolated to also cover two Article 8 provisions, namely FDP extensions due to in-flight rest and split duty. Reporting requirements are transposed from Subpart Q. The reports shall be preserved under record keeping requirements (see also paragraph 150.).
102. In addition, operators are required to establish procedures specifying how commander's discretion should be exercised. Extensive draft GM gives direction on the factors that at least should be considered by operators when developing their commander's discretion policy. A description of a non-punitive process for the use of commander's discretion shall be included in the Operations Manual.
103. Just as in Subpart Q, the maximum basic unextended daily FDP may be increased by 2 hours unless the flight crew has been augmented, in which case an increase of 3 hours is permitted. The same shall also apply to extended FDPs due to in-flight rest and split duty. The provision allowing a flight to continue to its planned destination or alternate if unforeseen circumstances occur on the final sector and after take-off and result in permitted increase being exceeded is maintained. Minimum rest may be reduced, but not below 10 hours. The requirements on reporting commander's discretion resemble those from Subpart Q.
104. A potential safety gain here is achieved through the combination of mandatory FRM training as described in paragraph 76 and the new operator requirement to establish and describe non-punitive procedures for the exercise of commander's discretion in the Operations Manual.
- m- Unforeseen circumstances in actual flight operations — Delayed reporting

¹⁷ Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations (FTL) and to provide guidance and advice to the FTL Review Group – Final Report – Philippe Cabon.

¹⁸ Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations (FTL) and to provide guidance and advice to the FTL Review Group – Final Report – Mick Spencer.

105. For the sake of operational flexibility and to cater for situations such as aircraft becoming unserviceable shortly before reporting, provisions for 'delayed reporting' have been included in the draft CS. Several stakeholders had suggested including provisions regulating the conditions for short-term re-planning in case of unforeseen circumstances before reporting. In the absence of scientific evidence, but following scientific advice and opinion¹⁹, the proposal is based on operational experience and existing national regulation. According to the draft CS an operator may only benefit from this flexibility if procedures for delayed reporting are described in the Operations Manual and if a notification time which allows a crew member to continue his/her rest when the delayed reporting procedure is activated, has been established.

n- Different limits for cabin crew and pilots

106. Subpart Q provision allow an FDP to be extended for cabin crew by the difference in reporting time between cabin crew and pilots as long as this difference does not exceed 60 minutes is maintained. The IR also includes a clarification that 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. Otherwise a reporting time 60 minutes before the flight crew could result in a one hour shorter maximum daily FDP for the cabin crew due to the FDP reduction applied in the early morning hours. In order to avoid misinterpretation an explanation is included limiting the use of this provision to cases where cabin crew require more time for their pre-flight briefing. Although cabin crew and pilots are equally affected by fatigue, it is unlikely that cabin crew would need to maintain the same level of alertness required by those in control of the aircraft during the landing.²⁰

Flight times and duty periods

107. Flight times and duty periods are reflected in ORO.FTL.210 and transpose the limits from Subpart Q. Following stakeholder input the Agency has added two extra limits. Despite the fact that scientific evidence as regards prescriptive limits for cumulative duty is scarce, especially because the cumulative fatigue effects of duties depend largely on how these duties are combined, the Agency has followed stakeholder requests to include an additional 14-day duty limit of 110 hours and a rolling flight time limit of 1 000 hours in any 12 consecutive calendar months.

a- Daily duty limit

108. The Agency believes that an additional daily duty limit would not result in a safety improvement. Daily activity of crew members is limited by daily maximum FDP. Daily duty will only have an impact on fatigue when crew members are engaged in other than flying duties (i.e. training, administrative tasks, positioning). This impact however, is taken into account in the rest requirements (see also paragraphs 128 & 129). The minimum rest prior to any FDP is as long as the preceding duty.

b- 7-day duty limit and 28-day duty limit

109. The Subpart Q limits of 60 duty hours in any 7 consecutive days and 190 duty hours in any 28 consecutive days have been maintained.

c- 14-day duty limit

110. In addition to the duty limits above, cumulative duty is limited to 110 hours per 14 consecutive days. A number of commenters required to set the limit to 100 hours. However the Agency believes that as a countermeasure against cumulative fatigue, the

¹⁹ Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations (FTL) and to provide guidance and advice to the FTL Review Group – Final Report –Mick Spencer.

²⁰ Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations (FTL) and to provide guidance and advice to the FTL Review Group – Final Report –Mick Spencer.

proposed 110-duty-hours-per-14-consecutive-days-limit, in combination with additional and improved extended recovery rest requirements (see also paragraph c- Recurrent extended recovery rest periods under the chapter on rest periods), is sufficient.

d- Additional gliding limit of 1 000 flight hours in any 12 consecutive months

111. Although no scientific evidence could be found to substantiate a specific limit of flight hours in 12 months, the scientists contracted by the Agency to assess NPA 2010-14 were of the opinion that a gliding limit was necessary to avoid an excessive number of hours in 12 months. This view is shared by the majority of stakeholders. A limit of 1 000 flight hours in any 12 consecutive calendar months is added in the IR. The benefit of this extra limit is to strengthen the Subpart Q requirement to spread out duty as evenly as practicable and to avoid the accumulation of 1 300 flying hours in 12 calendar months (i.e. 13 times 100 flight hours per 28 days).

Positioning

112. The well-known provisions from Subpart Q shall continue to apply to positioning. To provide a better structured rule, the Agency has decided to dedicate a special paragraph to positioning instead of dealing with the issue in the FDP paragraph.

Split duty

113. Under Article 8 a variety of provisions regulating split duty are being applied in different Member States. Presumably this variability is the answer to the diversity of operational needs. In order to preserve some flexibility the harmonised proposal, although being primarily based on the current regulation of one Member State, is placed in the draft CS. Only the elements of split duty which have to be specified in the flight time specification scheme are listed in the IR as follows:

- the minimum duration of a break on the ground; and
- the increase of the FDP taking into account the duration of the break and the facilities provided to the crew member to rest.

The IR also establishes that the break on the ground shall count in full as FDP and that a split duty shall not follow a reduced rest.

114. These core requirements are further developed in the applicable draft CS as listed below:
- The break on the ground within the FDP has a minimum duration of 3 consecutive hours.
 - The break excludes the time for post and pre-flight duties and travelling time which are counted for a minimum of 30 minutes.
 - The maximum basic (unextended) FDP may be increased by up to 50% of the break.
 - Suitable accommodation is provided for a break of either 6 hours or more or for a break that encroaches the WOCL.
 - In all other cases:
 - accommodation is provided; and
 - 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.
 - Split duty cannot be combined with in-flight rest.

Standby, Airport duty and Reserve

115. Standby, being a provision used to manage unforeseen circumstances and provide flexibility, is currently under Article 8 subject to a wide range of national solutions. Only certain aspects of standby are prescriptively regulated under Subpart Q. These basic requirements are reproduced in ORO.FTL.225. In order to allow crew members to plan

adequate rest all forms of standby shall be rostered and the start and end time of standby shall be defined and notified in advance. The elements subject to the provisions of Article 8 are placed in CS to retain partly the flexibility that exists today.

a- Airport standby

116. For airport standby the Subpart Q requirement to provide accommodation to the crew member and to count airport duty in full as duty time is retained in IR. The draft CS fills the gap that was left by Subpart Q by specifying that:
- airport standby not leading to the assignment of an FDP is followed by a rest period;
 - the maximum FDP is reduced by any time spent on standby in excess of 4 hours or between 22:00 and 07:00; and
 - the maximum combined duration of airport standby and assigned basic maximum FDP is 16 hours.
117. This 16-hour ceiling is however not applicable for the assignment of FDPs with split duty or where in-flight rest is provided.
118. These provisions for airport standby are supported by a majority of stakeholders. They are more restrictive than most currently applied national Article 8 provisions for airport standby, especially by introducing the 16-hour ceiling for the combined duration of airport standby and assigned FDP.

b- Airport duty

119. The operator is not required to provide accommodation to crew members on airport duty. Although no direct scientific evidence is currently available on this issue, it can be assumed that being at the airport without the possibility to relax in accommodation is as fatiguing as actually being an operating crew member. Therefore, airport duty as described in paragraph 68 shall count in full as FDP from the start of the airport duty reporting time.

c- Other standby

120. ORO.FTL.225 lists the following requirements to be defined in flight time specification schemes:
- a maximum duration for all forms of standby;
 - the impact of standby on the maximum FDP that may be assigned resulting from standby;
 - the basic minimum rest period following standby which does not lead to assignment of an FDP; and
 - how time spent on standby shall be counted for the purpose of cumulative duty hours.
121. The prescriptive limits for these requirements are included in the draft CS as listed below:
- the maximum duration is 16 hours;
 - times count as 25% of duty time for the purpose of ORO.FTL.210;
 - standby is followed by a minimum rest period;
 - if a call to report for a duty occurs within the first 8 hours, the maximum FDP counts from reporting;
 - if a call to report for a duty occurs after the first 8 hours, the maximum FDP is reduced by the amount of short-call standby time exceeding 8 hours; and
 - ceases when the crew member reports at the designated reporting point; and

- 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 reporting place within a reasonable time.
122. These restrictions are a medium term between the practice existing in the majority of Member States to limit the duration of 'other standby' to 24 hours and allow a full FDP to be operated even if an assignment occurs at the very end of the standby period and the provision applied in few Member States limiting other standby to 12 hours.
- d- Reserve
123. The definition of 'reserve' described in paragraph 68 refers to a time period during which a crew member might receive an assignment for duty at least 10 hours before the reporting time. That means that the crew member will be able to plan rest to a certain extent.
124. That is the reason why the draft CS does not foresee any restriction on the maximum FDP if a crew member receives an assignment for an FDP during a reserve period. The draft CS defines that reserve times do not count as duty for the purpose of cumulative duty and do not generate rest if no duty has been assigned. Operators shall define the maximum duration of each reserve period and for how many continuous days the reserve status may be sustained.
125. Although only few Member States have provisions for such a status and in general the assignment of duties with an intervening rest period is only controlled by operator best practices, the Agency sees a safety improvement in a harmonised approach. This view is shared by stakeholders, especially because this rule will make regulatory oversight of this issue easier.
126. General requirements are described in IR. The draft CS reproduces current practices in some Member States.

Rest periods

127. ORO.FTL.235 reproduces the rest requirements as well-known from Subpart Q. The Agency proposes solutions in the draft CSs where, under Article 8, Member States are currently applying national provisions or where stakeholder input and the review of scientific literature has flagged the need to propose further regulation. The prescriptive parameters for minimum rest are placed in IR and equal to the provisions in Subpart Q as follows:
- a- Minimum rest period at home base
128. The minimum rest period provided before undertaking an FDP starting at home base shall be as long as the preceding duty or 12 hours, whichever is greater.
- b- Minimum rest period away from home base
129. 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. Away from home base crew members do not travel by their own means to and from the airport to their place of rest. The requirement that the rest period shall include an 8-hour sleep opportunity in addition to the time for travelling and physiological needs is maintained.
- c- Recurrent extended recovery rest periods
130. The *minimum* requirements for extended recovery rest periods resemble those of Subpart Q. Following stakeholder input, supported by scientific evidence, the possibility for Member States to decide that the second local night may start at 04:00 has however, been removed. The minimum recurrent extended recovery rest period shall be 36 hours, including 2 local nights, such that there shall never be more than 168 hours between the end of one recurrent extended recovery rest period and the start of the next.

131. Although the scientific evidence as regards the quantification of cumulative fatigue is scarce, some stakeholders have suggested increasing the extended recovery rest period periodically. Such a measure has also found backing in the scientific assessment of NPA 2010-14.
132. The recurrent extended recovery rest period shall be increased to 2 days twice every month.
- d- Reduced rest
133. Reduced rest arrangements are currently subject to Article 8 provisions. Their use is widely accepted to recover from operational disruptions and enable certain operations. They are in general based on the principle that the FDP following the curtailed rest is reduced by the shortfall of the rest period, furthermore shall this shortfall be recovered in the subsequent rest. Some Member States also limit the frequency of reduced rest between 2 recurrent recovery periods or in 1 month.
134. The draft CS define minimum rest periods under reduced rest provisions at home base and out of home base. The following reduced rest requirements find the support of the majority of stakeholders:
- The minimum reduced rest periods under reduced rest arrangements are 12 hours at home base and 10 hours out of base.
 - Reduced rest is used under fatigue risk management.
 - The rest period following the reduced rest is extended by the difference between the unreduced minimum rest period (as defined in the IR) and the reduced rest.
 - The FDP following the reduced rest is reduced by the difference between the unreduced minimum rest period (as defined in the IR) and the reduced rest.
 - There is a maximum of 2 reduced rest periods between 2 recurrent extended recovery rest periods.
- e- Time zone crossing
135. The draft CS complement the IR requirement to compensate the effects of time zone differences. The effect of time zone differences and how to compensate these effects is without a doubt a highly complex issue. In recognition of the complexity of this issue the draft CS require operators to monitor rotations (as described in paragraph 65.) and combinations in terms of their effect on crew fatigue.
136. Additional rest is provided upon return to home base if an FDP involves a time difference of 4 hours or more between the local time of the point of departure and the point of arrival. The additional rest is measured in local nights, because according to scientific literature the most relevant zeitgeber²¹ for the body clock is the day-night rhythm.
137. The introduction of 'reference time' as described in paragraph 63 simplifies the calculation of the additional rest that shall be provided at home base, especially if crew members on the same rotation have their home base in neighbouring time zones.
138. The minimum rest after a rotation as described in paragraph 136. is at least 2 local nights and is increased as a function of the *time elapsed since reporting for a rotation*

²¹ **Zeitgeber** (from [German](#) for "time giver," or "synchronizer") is any exogenous (external) cue that synchronizes an organism's endogenous time-keeping system (internal clock) to the earth's 24-hour light/dark cycle. The strongest zeitgeber, for both plants and animals, is light. Non-photic zeitgebers include temperature, social interactions, pharmacological manipulation, exercise, and eating/drinking patterns. To maintain clock-environment synchrony, zeitgebers induce changes in the concentrations of the molecular components of the clock to levels consistent with the appropriate stage in the 24-hour cycle, a process termed [entrainment](#). [.[source: Wikipedia].]

encompassing at least 4 hours' time difference to the reference time and the maximum time difference between reference time and the local time where a crew member rests during a rotation.

139. The number of minimum local nights of rest at home base to compensate for time zone differences is reflected in a user-friendly table in the draft CS. This table transposes scientific principles as explained during the scientific assessment of NPA 2010-14. For the case of transitions of rotations in opposite directions, the draft CS foresees an additional local night of rest at home base.
140. Away from home base the minimum rest period is at least as long as the preceding duty or 14 hours, whichever is greater.

f- Disruptive schedules

141. Notwithstanding only one Member State includes the notion of 'early start' and 'late finish' in its FTL requirements, stakeholders have found sufficient scientific support to substantiate the need to compensate for the additional cumulative fatigue due to disruptive schedules as described in paragraph 66.
142. Studies carried out in the Member States that limit the number of early starts in one working block have shown that switching transitions from one type of duty to another are fatiguing too. Limiting the consecutive number of such duties might therefore not be the most effective mitigating measure to compensate for the sleep loss because such a limitation encourages operators to roster transitions once the limit of i.e. early starts is reached.
143. The need to compensate for the cumulative sleep loss following such duties and transitions of such duties is accepted by the majority of stakeholders. The scientific assessment of NPA 2010-14 has also suggested including mitigating measures of some sort.
144. Consequently, the draft CS foresee prolonging the second extended recovery rest period to 60 hours for a crew member performing 4 or more FDPs classed as 'disruptive schedules' between 2 extended recovery rest periods. Also, when at home base a transition is planned from a late finish/night duty to an early start, the rest period between the 2 FDPs shall include one local night. These measures are supported by stakeholders.
145. The cultural differences related to time of day (see also paragraph 66.) and the resulting adjustment of the definitions make an amendment of Annex II – Authority Requirements for Air Operations (Part-ARO) to the draft Commission Regulation on Air Operations – OPS necessary. The following authority requirements are included: The competent authority shall determine the disruptive schedules as 'early type' or as 'late type' for all commercial air transport operators under its oversight.

g- Back-to-back operations

146. ORO.FTL.235 includes a provision allowing to apply the requirements for minimum rest away from home base at home base if the operator provides suitable accommodation to the crew member. In that case crew members do not have to travel by their own means to and from the airport. Such a practice is already permitted under Subpart Q.
147. An analogous exception to the general rule for compensatory rest at home base is included in the draft CS for the rest requirement following time zone transitions. Also here the minimum rest away from home base may be applied at home base as long as the operator provides suitable accommodation to the crew member.

Nutrition

148. The Subpart Q requirement for a meal and drink opportunity is reproduced in IR, in addition and to facilitate regulatory oversight, operators shall specify in the Operations Manual how they ensure crew members' nutrition during FDP.

Records

149. ORO.FTL.245 requires operators just as in Subpart Q to maintain *individual* records for each crew member including :

- flight times;
- start, duration and end of each duty period and FDP; and
- rest periods and days free of all duties;

In addition to records of these data and in order to allow regulatory oversight of the requirement to increase the extended recovery rest period in the case of a change of base as described in paragraph 77, data of the *assigned home base* shall be kept.

150. The general requirement to establish a system that allows reliable traceability of all activities developed²² is further explained by including the obligation to keep reports on extended flight duty periods and reduced rest periods.

151. To assist individual crew members with their obligations under CAT.GEN.MPA.100²³ to provide each operator with the data needed to schedule activities in accordance with FTL requirements when undertaking duties for more than one operator, operators are required to provide upon request copies of individual records of flight and duty times and rest periods to the crew member concerned and to another operator in respect of a crew member who is or becomes a crew member of the operator concerned.

V. Regulatory Impact Assessment

152. The following impacts have been identified and are summarised below. See Appendix I for the full Regulatory Impact Assessment.

Safety impact

General

- Harmonized safety standards of a high level across all EU-27 + 4 by introducing uniform safety requirements for all FTL aspects.

Home base

- A single airport location assigned with a high degree of permanence.
- Increased extended recovery rest period prior to starting duty after a change of home base.
- Travelling between the former and the new home base counts as duty (either positioning or FDP).
- Records on assigned home base to be kept for 24 months.

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.
- Additional cumulative duty limit per 14 days.
- Additional rolling limit per 12 calendar months.
- Prolonged extended recovery rest period twice a months.
- Increased extended recovery rest to compensate for disruptive schedules.

²² [Draft Regulation on Air Operations.](#)

²³ [Draft Regulation on Air Operations.](#)

Maximum basic daily FDP

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

Planned FDP extensions

- The possibility to plan extensions for most unfavourable starting times has been removed.

FDP extension due to in-flight rest

- Extension based on quality of in-flight rest facility.
- No extension due to in-flight rest in economy seats.

Commander's discretion

- Non-punitive reporting process.

Split duty

- Defined minimum standards for accommodation and suitable accommodation.
- Protection of useful break duration by excluding post and pre-flight duties and travelling from the break.

Airport standby

- Defined minimum standards for accommodation during airport standby.
- FDP reduced for time spent on airport standby in excess of 4 hours and during night hours.
- 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).
- Minimum rest period after airport standby as long as duty.

Standby other than airport standby

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

Reduced rest

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

Rest to compensate for time zone differences

- Increased rest at destination.
- Monitoring of fatiguing effects of rotations.
- Additional rest after alternating rotations east-west / west-east.
- Minimum rest at home base measured in local nights with a minimum of 2 local nights after significant (4 or more) time zone transitions.

Fatigue management training

- Mandatory initial and recurrent training for crew members, crew rostering personnel and concerned management personnel.

Other elements

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

Social impact

The social impact is expected to be limited as the rule represents a careful and well balanced update to Subpart Q.

Economic impact

Overall a low economic effect is estimated for the Agency proposal. The Low Cost Airlines should have a negligible cost impact and Legacy, Regional and Cargo Operators a limited cost impact. Charter Operators may incur a more significant cost impact than the other categories of operators, especially due to the ban of economy seats as in-flight rest facility, but this has to be balanced by the correlated safety improvements. Furthermore, the flexibility provided by the use of CS in this area, combined with appropriate transition measures will provide the Charter Operators with an opportunity to develop alternative in flight rest facilities, meeting both their economic model and the requirement for a high uniform level of safety.

Impact on regulatory coordination and harmonisation

A positive impact on harmonisation is to be expected from this Agency proposal. The rule will improve the level playing field in the EU and hereby contribute to fair competition. Until today crew fatigue regulations have not been identified as a harmonisation topic between the Agency and its main international counterpart. Furthermore, does the rule not represent a fundamental change to the existing rule, therefore the impact on international coordination and harmonisation is expected to negligible.

Cologne, 28th September 2012.

P. GOUDOU

Executive Director