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IMPACT ASSESSMENT

Accompanying the document

COMMISSION REGULATION

amending Regulation (EU) N° 965/2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) N° 216/2008 of the European Parliament and of the Council

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Disclaimer: This impact assessment commits only the Commission's services involved in its preparation and does not prejudge the final form of any decision to be taken by the Commission.

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Impact assessment on Legislative proposals to revise EU safety legislation concerning aircrew fatigue

A. Need for action

Why? What is the problem being addressed?

In general, the current EU safety aircrew fatigue (FTL) rules are comprehensive, but need some adjustments. In cooperation with stakeholders and the European Aviation Safety Agency (EASA), some problems have been identified in three areas: (1) FTL rules are outside the common EU legislative framework of air safety and consequently not under the direct EASA supervision. Furthermore, in certain areas of FTL, the rules applied by Member States differ. (2) Certain FTL rules need to be adapted according to the latest scientific, operational and international developments. These include fatigue risk management, maximum flight time and duty limitations, recurring rest periods and rules in case of disruptive schedules. (3) There are still differences in how the existing rules are interpreted and implemented, consequently certain rules need to be clarified.

The initiative will have effects on aircrew members, air carriers, Member States competent authorities and passengers.

What is this initiative expected to achieve?

The general objective of the initiative is to contribute to avoiding aircraft accidents, and related fatalities, through the improvement of the existing FTL system. This is translated into three specific objectives:

- ensuring a coherent and uniform legislative framework for EU aviation safety;
- having state of the art EU FTL rules;
- improving clarity and ensure common interpretation of the current EU FTL legislation.

What is the value added of action at the EU level?

Air carriers operate transnationally throughout the EU and carry passengers of different nationalities. Pilots and cabin crew duty rosters include a combination of flight and rest periods taking place often in different Member States. It is therefore important for air carriers, aircrew as well as passengers to have harmonised rules where possible to avoid incompatible or contradictory requirements in different territories and ensure equal safety standards for the passengers on board. To ensure a proportionate approach, a mixture of hard and soft law elements is used. This allows for certain flexibility in the way the rules are implemented while the core principles of the legislation are always respected.

B. Solutions

What legislative and non-legislative policy options have been considered? Is there a preferred choice or not? Why?

The core policy options considered in this Impact Assessment (IA) are option 1: *Transfer current EU FTL rules to the EASA regulatory framework without any change* (the baseline scenario) and option 2: *Transfer revised EU FTL rules to the EASA regulatory framework*. The technical revision under option 2 could be done in various ways as discussed under the different suboptions. First suboption 2.1 follows fully the EASA recommendations. Suboptions 2.2.a - 2.2.c depart from the EASA recommendations for certain technical parameters. Option 2.2.a considers more stringent night flight duty limits (10 hours instead of 11), option 2.2.b considers whether there should be two options or only one for defining disruptive schedules, and option 2.2.c proposes an additional mitigating measure for regulating the standby periods outside the airport. Option 2.1 is the preferred one providing an effective and efficient way to revise the FTL rules. Option 2.2.c has some additional safety benefits, but the standby rules under this option are part of the technical soft law under EASA competences. They should be considered by EASA while developing the relevant Certification Specification.

Who supports which option?

First suboption 2.1, which follows fully the EASA recommendations, reflects the consensus achieved with most of the stakeholders over more than three years of assessment and consultations conducted by EASA and the Commission. The aircrew representatives have expressed their wish for more protection or legal certainty on a number of additional issues, such as night flights, standby outside the airport, early starts, reserve, in-flight rest of cabin crew, delayed reporting, airport duties and more protective national provisions. Some of these issues needed just clarifications, while certain others relate to social protection rather than to safety framework. Three remaining substantial safety related issues have been included in the assessment of this IA as suboptions 2.2a - 2.2.c.

C. Impacts of the preferred option

What are the benefits of the preferred option (if any, otherwise main ones)?

All measures recommended by EASA under option 2.1. aim at increasing safety, either through more coherent legislative and administrative framework, more protective rules (for example, in terms of additional rest or reduced duty periods) or through the clarification of the existing rules. The proposed safety measures include a reduction of duty times and an increase of rest as well as improvement of in-flight rest facilities. Thus there are also positive side impacts on the working conditions of the crew, which are directly correlated to the safety improvements.

What are the costs of the preferred option (if any, otherwise main ones)?

More stringent flying time and minimum rest rules would bring some additional operational costs to the airlines in terms of crew productivity. A negligible operational cost impact is expected for low cost airlines, a limited cost impact is expected for legacy, regional and cargo operators, while charter operators may feel more impacted due to their particular business model. Due to the lack of access to roster data and variety/complexity of different business models, operational costs cannot be quantified. The IA provides qualitative assessment which has been peer-reviewed by operators, who in general agreed that cost additions are proportionate to the safety benefits achieved.

Limited implementation costs were identified for all operators in order to rearrange the management of duty rosters. Very limited administrative burden are expected for airlines, national aviation authorities and EASA, as only minor additional reporting obligations are proposed.

How will businesses, SMEs and micro-enterprises be affected?

Operational costs for operators are discussed above. This initiative has no direct effect on SMEs and micro-enterprises, given that air carriers are in general large companies.

Will there be significant impacts on national budgets and administrations?

No. Very limited enforcement costs are expected for national aviation authorities and EASA as no new oversight obligation is included. It is possible that the clearer rules will facilitate oversight of compliance and therefore reduce enforcement cost in some areas.

Will there be other significant impacts?

Option 2.1 is expected to maintain the competitiveness of European operators, despite some cost increases necessary to achieve the safety enhancements. Importantly, more harmonised rules would improve the level playing field in the EU and therefore contribute to fair competition between the European operators.

D. Follow up

When will the policy be reviewed?

It is proposed also to launch a monitoring and research programme to further investigate aircrew fatigue and performance, which includes 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. The policy review will be initiated according to the results of the programme.

1. INTRODUCTION

1.1. POLICY CONTEXT

Aviation safety is already largely regulated at EU level, including a wide set of technical operational rules related to all aspects of "safe flying" under Annex III to Council Regulation (EEC) No 3922/91[1], which was inserted by Regulation (EC) No 1899/2006 (EU-OPS[2]) and which applies since July 2007.

Subpart Q of Annex III to EU-OPS includes mandatory EU measures related to fatigue and alertness of flight crew, commonly called "flight and duty limitations and rest requirements" (or "flying time limitations"- FTL[3]). In particular, these requirements were inserted with the aim of ensuring that flight and cabin crew members are performing safety functions on board an aircraft at an adequate level of alertness.

In order to improve the safety and efficiency of civil aviation, all aviation safety rules have been gradually transferred into the single legal framework of Regulation (EC) No 216/2008[4], which entrusts the European Aviation Safety Agency (EASA) as the single EU aviation safety body to prepare, implement and monitor the application of these rules (hereinafter EASA Basic Regulation).

The transfer of safety rules on air operations into the EASA Basic Regulation is prescribed by law for legal consistency: one single legal framework for all air safety legislation, as explained by the Commission 2005 Communication *"Extending the tasks of the European Aviation Safety Agency - An Agenda for 2010"*[5]. Such transfer was initiated in 2003, starting with airworthiness and environmental requirements for aircraft[6], and rules concerning aircrew qualification[7] and air traffic management[8] have been already transferred. Concerning air operations, the transfer was completed between 2011 and 2012 for all aspects of EU-OPS[9] except for its FTL provisions.

As for all safety fields mentioned above, the EASA Basic Regulation requires the Commission to adopt an implementing regulation[10] (via the comitology regulatory

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1 Council Regulation (EEC) No 3922/91 of 16 December 1991 on the harmonization of technical requirements and administrative procedures in the field of civil aviation (OJ L 373, 31.12.1991, p. 4)

2 Regulation (EC) No 1899/2006 of the European Parliament and of the Council of 12 December 2006 amending Council Regulation (EEC) No 3922/91 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation.

3 List of abbreviations is provided in Annex 1.

4 OJ L 79, 19.3.2008, p.1.

5 COM(2005) 578 final.

6 Commission Regulations (EC) No 1702/2003 (OJ L 243, 27.9.2003, p. 6) and 2042/2003 (OJ L 315, 28.11.2003, p. 1).

7 Commission Regulation (EU) No 1178/2011 (OJ L 311, 25.11.2011, p. 1) and 290/2012 (OJ L 100, 5.4.2012, p. 1).

8 Commission Implementing Regulations (EU) No 1035/2011 (OJ L 271, 18.10.2011, p. 23), 1034/2011 (OJ L 271, 18.10.2011, p. 15) and 923/2012 (OJ L 281, 13.10.2012, p. 1).

9 See Commission Regulations (EU) No 1178/2011 (OJ L 311, 25.11.2011, p. 53), No 290/2012 (OJ L100, 5.4.2012, p. 1) and No 965/2012 (OJ L 296, 25.10.2012, p. 1).

10 Under the omnibus legislative proposal aligning comitology procedures with the requirements of the Lisbon Treaty, currently prepared by the Commission, it has been proposed that the current PRAC procedure becomes subject to delegated acts.

procedure with scrutiny - PRAC) to transfer the current FTL rules contained in EU-OPS to the legislative and institutional framework of the EASA Basic Regulation[11]. The aim is to ensure a coherent safety regulatory system at EU level. A more coherent system is also requested by all stakeholders who would see the transfer as a positive development.

Furthermore, apart from the technical transfer of the rules, EU-OPS and the Basic Regulation require a revision of the existing rules in line with latest scientific evidence and technical developments (Article 8a of Regulation (EC) No 1899/2006 and Article 22(2) of the EASA Basic Regulation).

The deadline for such a transfer was fixed at 8 April 2012 by the EASA Basic Regulation and extended, for FTL provisions, by Commission implementing Regulation (EU) 965/2012[12], given the additional time necessary to review the current system by EASA.

FTL safety rules are without prejudice to the applicable EU and national social legislation, including rules concerning working time, health and safety at work or the existing collective labour agreements (CLAs). For example, the transfer and revision of the FTL rules does not weaken in any way the provisions of EU social law, such as the Directive on organisation of working time of mobile workers in civil aviation[13] or the Working Time Directive[14].

The relation between safety and social rules is based on the principle that the most protective rule applies. As a consequence, EU safety FTL rules allow the application of more protective social legislation and CLAs but prevail over less protective ones. If, due to the safety reasons, FTL provisions are more detailed and more favourable to workers and thus result in better protection, FTL rules prevail over the national social legislation and CLAs.

Scope of this Impact Assessment

EASA was created in 2003 in order to be the single EU specialised expert body in the field of aviation safety. The agency's responsibilities include[15]: expert advice to the EU for drafting new legislation; assisting Member States in fulfilling international and EU safety rules; implementing and monitoring EU safety rules, including inspections in the Member States; certification of aircraft and components, as well as the approval of organisations involved in the design, manufacture and maintenance of aeronautical products; safety authorization of third-country (non EU) operators; aviation safety analysis and research.

In accordance with this mandate, **EASA has delivered to the Commission its technical Opinion 04/2012**[16] on how the current FTL rules could be transferred into the legislative framework of the EASA Basic Regulation and adjusted in line with the latest scientific evidence as well as experience on safety. The EASA opinion is the result of a long preparation process, including consultation and assessment of impacts. Consequently the current Commission Impact Assessment (IA) is a proportional document, which will

[11] See Articles 8, 22 and 69 of the EASA Basic Regulation.
[12] See Recital 6 and Article 8 of Commission implementing Regulation (EU) 965/2012.
[13] Council Directive 2000/79/EC (OJ L 302, 1.12.2000, p. 57).
[14] Council Directive 2003/88/EC (OJ L 299, 18.11.2003, p. 9–19).
[15] See Articles 17 to 19 of the EASA Basic Regulation.
[16] See EASA Opinion 04/20012, of 1.10.2012, and related material available at http://www.easa.europa.eu/agency-measures/opinions.php.

refer extensively to the preparatory work done by EASA, while looking in more detail at the certain issues not addressed by EASA or requiring further clarifications.

In line with the legislative framework of the EASA Basic Regulation, EASA has also recommended to complement the FTL requirements with technical provisions in **soft law** – so called Certification Specifications, Acceptable Means of Compliance and Guidance Material (further details concerning this soft law is provided under section 2.2.1). The precise content of this EASA material is not considered under this IA as it does not form part of the Commission initiative and will be finalised by EASA on the basis of the final Commission proposal. Nevertheless, this material may be mentioned where necessary to explain its interaction with the Commission proposal.

As far as **other FTL regimes** are concerned, it is widely accepted that the same aviation safety risk may be mitigated in different ways, using different combinations of mitigating measures, with the same effectiveness. Therefore, it is not possible to compare the EU FTL system or the package of interlinked measures proposed by EASA to other regulatory systems in the EU or around the world. For example, in general the EU FTL system focuses mostly on adequate rest before flight duties to avoid fatigue, while the US system shortens the length of flight duties. These are two different ways to ensure an equivalent safety level.

At **international** level, the International Civil Aviation Organisation (ICAO) sets out standards for safe air transport, including for FTL. The current EU FTL rules are considered compliant to those standards, which basically request to establish regulations for the purpose of managing fatigue that are based upon scientific principles and knowledge[17]. ICAO provides guidance on essential elements of an FTL regime but does not prescribe any limits for duty or rest.

1.2. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.2.1. Organisation and timing

This impact assessment is prepared by Directorate-General for Mobility and Transport (DG MOVE) to support the legislative proposals on the revision of current EU air safety legislation concerning aircrew fatigue (EU-OPS) (Agenda Planning reference 2013/MOVE/036).

DG MOVE was assisted, for the preparation of this IA by an IA Steering Group (IASG) created in April 2013, to which four Directorates-General of the Commission - Secretariat General (SG), Legal Service (LS), DG Employment, Social Affairs and Inclusion (DG EMPL), and DG Health and Consumers (DG SANCO) - were invited to contribute. The IASG met once on 15 May 2013, in view of discussing a draft IA to be submitted to the IAB.

[17] The ICAO requirements concerning fatigue risk management are contained in Annex 6 to the Convention on International Civil Aviation, Chapter 4.10 and related Appendixes 2 and 8, http://www.icao.int/safety/fatiguemanagement/Fatigue%20Management%20Docs/FM_Annex%206%20Pt1.pdf.

In addition, there have been bilateral exchanges of documents and comments related to the preparation of the legislative proposal between DG MOVE and SG, DG EMPL and DG SANCO[18].

1.2.2. External expertise

To support the Commission with the revision of the FTL rules, EASA has over the last three years conducted a thorough process of evaluation of the current EU FTL framework, assisted by stakeholders. The provisions of the first consultation document published by EASA (Notice of proposed amendment (NPA) 2010-14[19]) were also scientifically assessed with the support of three independent scientists, who were selected by EASA through a public tender process. The scientific reports were published as Appendix III of the second consultation document published by EASA (Comment Response Document (CRD) 2010-14[20]).

As a result of this process, on 1st October 2012 EASA presented to the Commission its technical Opinion 04/2012[21] explaining how the current FTL rules could be transferred into the legislative framework of the EASA Basic Regulation and adjusted in line with the latest technical developments aiming at improved safety. The EASA preparatory work includes two detailed regulatory impact assessments – the EASA Regulatory Impact Assessment included as Part B of the NPA 2010-14[22] (hereinafter 'EASA 2010 RIA') and the EASA RIA accompanying the Opinion 04/2012[23] (hereinafter 'EASA 2012 RIA'), and the summary of stakeholders' views on the detailed technical options considered[24] (hereinafter ' EASA CRD').

1.2.3. Consultation of stakeholders

Two consultations of stakeholders were conducted by EASA between 20.12.2010-20.3.2011 and between 18.1.2012-19.3.2012, and published through its website[25]. The consultation was open to any person, country, association or organisation around the world wishing to comment.

During the first consultation round, EASA received comments from 2.715 individuals and organisations, including: 2.636 individuals (almost all crew members), 12 National Aviation Authorities (NAAs), 37 professional and crew organisations (including 26 workers' organisations and 9 operator organisations) and 30 individual operators. While interpreting the consultation results, it needs to be considered that of all individual comments, 98 % were duplicates or near duplicates and an important number of comments was either assigned several times or attached to questions not corresponding to the comment.

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18 Meetings were held with SG on 9.11.2012, 27.11.2012 and 11.4.2013, with DG EMPL on 12.2.2013, 18.3.2013 and 22.4.2013 and with DG SANCO on 19.10.2012 and 30.11.2012.

19 http://www.easa.europa.eu/rulemaking/docs/npa/2010/NPA%202010-14.pdf

20 http://www.easa.europa.eu/rulemaking/docs/crd/2011/CRD%202010-14/CRD%202010-14.pdf

21 See EASA Opinion 04/20012, of 1.10.2012, and related material available at http://www.easa.europa.eu/agency-measures/opinions.php.

22 http://www.easa.europa.eu/rulemaking/docs/npa/2010/NPA%202010-14.pdf

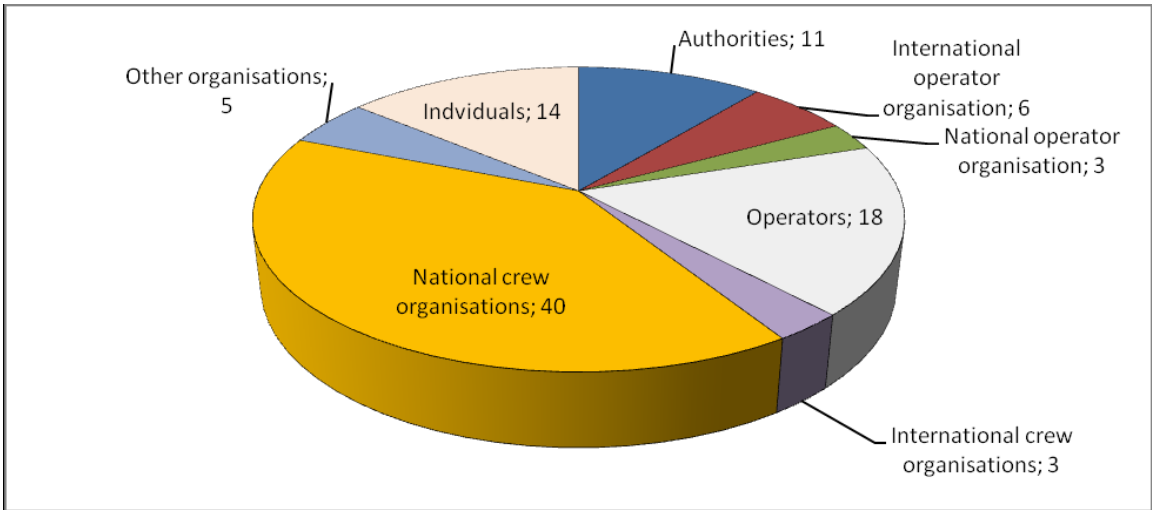
23 http://www.easa.europa.eu/agency-measures/docs/opinions/2012/04/Appendix%201%20to%20Opinion%2004-2012%20(RIA).pdf

24 EASA's Comment Response Document CRD 2010-14 http://www.easa.europa.eu/rulemaking/docs/crd/2011/CRD%202010-14/CRD%202010-14.pdf.

25 See documents called "NPA 2010-14", "CRD 2010-14", "Opinion 04/2012" and "Regulatory Impact Assessment" at http://www.easa.europa.eu/agency-measures/opinions.php#2012.

During the second consultation round, EASA received reactions to its Comment Response Document from 100 entities, including NAAs, organisations and individuals. The following figure provides an overview of the respondents. One consumer organisation (Consumentenbond Dutch Consumers' Union) commented on the CRD under the category of "other organisations". 30 unions commented among the category "crew organisations".

Figure 1. Respondents to the EASA Comment Response Document



In addition, EASA was assisted by a **group of experts** (Rulemaking Group OPS.055) from the EU stakeholders (including five Member States[26], five members of aircrew organisations[27] and five members of airlines organisations[28]) for the evaluation of all information, for the preparation of its proposals and for the assessment of comments received. This consultation process took place between December 2009 and September 2012 and was necessary to ensure a structured approach to this technically complex topic.

EASA has also consulted its rulemaking consultative body composed of EU Member State representatives (AGNA) on 24 October 2011 and other consultative bodies composed of Member State and industry representatives (RAG[29] and SSCC[30]) on 13 February 2013.

The Commission consulted the EASA Committee (comitology body composed of EU Member State representatives) on 24 and 25 October 2012, 19 February and 24 April 2013. It also presented the context and stage of the draft legislative proposal to the European Consumer Consultative Group on 30 November 2012, the European Parliament, ECA, ETF, AEA, IACA, ELFAA and EBAA[31] during several bilateral targeted meetings which took place between October 2012 and April 2013 (see detailed

[26] UK, France, Italy, Sweden, and Czech Republic, the latter was replaced later on by the Netherlands.
[27] Three members of the European Cockpit Association (ECA), representing EU pilots, and two members of the European Transport Workers' Federation (ETF), mainly representing cabin crew but also a number of pilots.
[28] Association of European Airlines (AEA), International Air Carrier Association (IACA), European Regions Airline Association (ERA), European Business Aviation Association (EBAA) and European Low Fares Airline Association (ELFAA).
[29] Rulemaking Advisory Group.
[30] Safety Standards Consultative Committee.
[31] List of abbreviation is provided in Annex 1.

list of meetings in Annex 2). The views of the aircrew and airlines' organisations mentioned above were also gathered during the meetings.

The consultations run by EASA (during the preparatory phase) and by the Commission (after EASA rendered its Opinion) showed a general wide support expressed by *Member States*. They recognized the balanced approach proposed by EASA and provided constructive comments focused on a limited number of possible improvements to the technical rules, mainly as regards standby or night flights

Most *airlines*, except the association representing some low cost carriers[32], acknowledged the need of revising current rules, expressed residual concerns (mainly as regards standby or night flights) but showed ready to accept the EASA proposals. They also submitted constructive proposals concerning ways of reducing the possible economic impacts on airlines, mainly concerning transitional periods.

Aircrews acknowledged the need of revising current rules but many expressed their wish for providing more protection or legal certainty concerning a number of issues, such as night flights, standby outside the airport, early starts in case of disruptive schedules, reserve, in-flight rest of cabin crew, delayed reporting, airport duties and treatment of more protective national provisions.

These concerns were transmitted to the European Parliament, which asked the Commission and EASA to provide explanations.

Certain issues raised by stakeholders (reserve, in-flight rest of cabin crew, delayed reporting, airport duties, more protective national provisions or transitional periods) have been clarified during the consultation process with the Commission, or solutions with minor effects have been agreed upon. The issues of night flights, standby outside the airport and early starts in case of disruptive schedules need more thorough assessment and are therefore specifically assessed as sub-options in this IA.

Given that all relevant parties have been given an opportunity to express their opinions, the minimum consultation standards of Commission have been met.

1.3. CONSULTATION OF THE IAB

This impact assessment was reviewed by the Commission Impact Assessment Board (IAB) on 22 May 2013. Based on the Board's recommendations, the impact assessment has been revised (see IAB Opinion, reference No 2013/MO VE/036).

[32] ELFAA was the only airline association stating that the revision of current rules was not needed, that EASA proposals were not based on reliable data and that a revision could lead to unnecessary burden and negative economic impact on its members. Other airline associations, such as AEA or IACA, expressed support for the more restrictive rules but highlighting that compliance would have an impact on their operations which should be kept at a reasonable level.

2. PROBLEM DEFINITION

2.1. DESCRIPTION OF THE CURRENT SYSTEM

EU-OPS established the first mandatory EU FTL requirements for aircrew. The aim was to ensure that flight and cabin crew members perform safety functions on board aircraft at a proper level of alertness. In a nutshell, EU-OPS includes general obligations on Member States, airlines and aircrew to ensure safe duty rosters[33]. It also contains, among other issues, flight duty limits per day, week, month and year as well as minimum rest requirements per day and month depending on previous duties.

The current EU FTL regulatory framework is in general considered as safe. It is amongst the most comprehensive and protective in the world. During the preparation process, EASA identified two accidents and eight serious fatigue-linked incidents involving three fatalities over the period 2000 to 2010. The analysis of these accidents and incidents by EASA showed that in two cases the crew operated outside the legal limits, one incident was linked to in-flight rest in economy seats and none of the incidents raised an issue with the current flight time limitations regime[34].

However, the mere lack of related accident and incident reports does not exclude the possibility of potential safety issues. Consequently, a pro-active and precautionary approach was taken by EASA while considering the revision of the FTL rules, going beyond the analysis of past data.

2.2. THE MAIN PROBLEMS

While assessing the need for updating the current legislation, it has been analysed to what extent:

- the existing legislative framework is coherent,
- the rules need to be revised and
- the rules need to be clarified to facilitate implementation and enforcement.

2.2.1. The fragmentation of the aviation safety legislative framework

Despite the legal obligation to transfer the current FTL rules to the EASA regulatory framework, as explained under section 1.1, the FTL rules are today the only EU aviation safety rules which still remain outside the common legislative framework of the **EASA Basic Regulation**. This fragmentation creates confusion concerning the legislative approach and the role of EASA. Another negative consequence is that EASA is not legally competent to assist the Commission with overseeing the correct implementation

[33] Ensuring safe duty rosters includes general obligations reflecting fatigue prevention principles such as regarding advance notification of working and rest schedules allowing crew members to be rested before starting flying duties, avoiding serious disruptions of sleep patters or planning of flights taking into consideration applicable limits. These are contained in OPS 1.1090 of EU-OPS.

[34] C.f. EASA 2010 RIA section 2.1, p. 5.

of the EU FTL rules, and to produce acceptable means of compliance and guidance material to assist Member States and industry in the implementation of the FTL rules.

Furthermore, there is a lack of a **uniform level** of safety in the area of FTL, contrary to other aviation safety areas. Legally binding harmonised safety rules should exist for all safety areas[35] in order to ensure a common safety level across all EU and facilitate cross-border air operations. This would allow for more legal certainty in dealing with safety issues and importantly also a level playing field among different EU operators. This means that EU FTL rules should replace all national safety FTL rules. **National deviations** would still be allowed but decided through prescribed procedures established under the EASA Basic Regulation (Articles 14 and 22 of the EASA Basic Regulation, see also the paragraph concerning flexibility in Box 1, in section 2.2.1).

Although the set of current rules in Subpart Q of EU-OPS was a big step towards providing harmonized safety standards at a high level, there were several areas where flexibility was necessary, given the lack of sufficient common grounds and experience at the time of the adoption of EU-OPS. Therefore, the Legislators, following the principles of subsidiarity and proportionality, allowed the Member States to *'adopt or maintain provisions'* relating to certain areas *'until Community rules based on scientific knowledge and best practices are established*'. These areas include:

1. rest compensating time zone differences;
2. duty extension due to in-flight rest;
3. split duty (the extension of a flight duty period (FDP) due to a break on the ground);
4. standby;
5. reduced rest.

As a result, Member States have put in place quite divergent practices in these areas, which cannot be always justified in condition of the internal market and which impede creation of a uniform and clear system ensuring high level of safety as required under the EASA Basic Regulation.

Consequently, during the review process EASA has assessed to what extent diverging national rules are justified and whether scientific knowledge and best practices would favour stronger harmonisation in these five areas. Further harmonisation of FTL rules, following the principles of the incremental approach (as explained in Box 1), has been a common objective of all stakeholders, including operators and crew organisations, and Member States.

Box 1 - Incremental approach to harmonisation through the combination of hard and soft law

The EASA Basic Regulation sets the general basis for an incremental approach to harmonisation in all safety areas through the combination of hard and soft law.

[35] While the safety rules should be harmonised, the more stringent social rules can still prevail, as described in section1.1.

Hard law

The EASA Basic Regulation mandates the Commission to adopt *implementing rules*, in the fields covered within its scope, in order to comply with the essential legislative requirements contained in its Annexes I, III, IV, Va and Vb. The requirements contained in the Basic Regulation and in implementing rules constitute a *hard law*. Implementing rules contain the essential rules and principles which apply to all types of operational models[36] and to all Member States.

Soft law

In order to complement this hard law, the Basic Regulation also request EASA to adopt *soft law* material called certification specifications, acceptable means of compliance and guidance material (see Articles 18 and 22(2) of the EASA Basic Regulation). In the field of FTL, certification specifications and acceptable means of compliance serve as a basis for airlines to draft the FTL scheme to be applied in their particular operational model. These FTL schemes are approved by their National Aviation Authorities only if they comply with the Basic Regulation as well as with applicable implementing rules, certification specifications and acceptable means of compliance. Guidance materials serve to explain the spirit of hard or soft law provisions.

Soft law adopted by EASA contains detailed technical provisions which develop the rules of *hard law*, providing with best practices allowing to fulfil the essential rules of hard law. **Soft law is frequently used to regulate issues where different ways of implementation, ensuring the same level of safety protection**, are possible or exist in different Member States or sectors of the industry. Soft law cannot contradict hard law provisions or go beyond its scope. This latter aspect is verified by the Commission and justifies that the Commission might instruct EASA, when necessary, to develop soft law material following a number of guiding principles or a concrete aim.

EASA proposal

Following the system explained above, EASA recommended, in its Opinion 04/2012, to translate Subpart Q into hard law (with some amendments were scientific evidence has identified a clear need for safety improvement) and to regulate under soft law all technical details concerning the five FTL areas that are currently left by EU-OPS to be regulated by Member States, as well as certain other aspects of its proposed revisions of EU-OPS. The proposed soft law is inspired by existing national rules, operational experience and based on scientific principles.

Level playing filed and flexibility

Since both hard and soft law replace national safety rules, the proposed rule structure promotes a level-playing field. At the same time, it can be sustained that this incremental approach to harmonisation provides the necessary level of flexibility needed in the field of aviation safety, in order to reflect different operational models and national circumstances, but ensuring an equivalent level of safety protection for all EU citizens.

Individual airlines or Member States may deviate from implementing rules, certification specifications and acceptable means of compliance provided that an equivalent level of safety can be demonstrated and that such **deviations are approved following the prescribed procedures**. In particular, Article 14 of the EASA Basic Regulation applies to deviations of implementing rules in all the areas of air safety. Article 22(2) of the EASA Basic Regulation contains the procedure applicable in case of deviations to certification specification in the area of FTL. In summary, Articles 14 and 22(2) provide for what has been called *controlled flexibility*.

2.2.2. Adaptation according to scientific and international developments

There is a legal mandate to verify the compatibility of current FTL rules with the latest scientific and operational knowledge and with international developments in the field of aircrew fatigue. Stakeholders fully endorse this.

[36] For this IA airline operations have been categorised as 'Legacy Airlines' with a business model based on a hub operation, 'Low Cost Carriers' operating point-to-point flights, 'Charter Operators' carrying out seasonal flights to holiday destinations, 'Regional Operators' connecting regions with a hub airport or operating between regional airports and 'Cargo Operators' transporting cargo. It should be noted that most individual operators have characteristics of more than one type of operation.

In line with a proactive approach, EASA used the following methodology in order to assess needs for revision of the existing FTL rules:

1. identify all possible hazards related to the fatigue of crew members;

2. identify generic mitigating measures associated with these hazards[37];

3. identify if and how these mitigating measures are covered by current rules;

4. identify other possible specific mitigating measures insofar as they are supported by scientific evidence, taking into account operational experience.

Following its analysis of the current system and of all available information, EASA concluded in its Opinion 04/2012 that there is still room to improve the current FTL system. The main issues covered by the above process are listed below.

Fatigue risk management

In this domain the current rules are not fully aligned to international developments. This concerns the introduction of fatigue risk management principles developed by ICAO[38] and of fatigue management training.

The current rules do not include any requirements on fatigue management training, although it is considered (e.g. suggestion of the scientist Alexander Gundel[39]) as an effective strategy to manage fatigue and could improve enforcement of the safety rules.

Protection against cumulative fatigue with maximum flight time and duty limitations

Subpart Q of EU-OPS limits cumulative duty periods to **190 hours in 28 consecutive days and 60 hours in 7 consecutive days**. These limits are deemed acceptable by the stakeholders as well as certain scientific reports and evaluations (e.g. the Moebus Aviation report 2008[40], p. 14).

However, these limits still allow to accumulate 180 duty hours in 21 consecutive days (equivalent of 3 x 60 hours per week), which might generate excessive cumulative fatigue in a short period of time.

Concerning the current cumulative limit of **900 block flight times**[41] **per calendar year**, the Moebus report points out that it may lead in practice to 1.800 flight hours in 18 consecutive months during peak periods, which both goes against the spirit of the rule and could lead to excessive cumulative fatigue.

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37 The full table of hazards and mitigation measures is available in section 9.2 of EASA Notice of Proposed Amendments 2010-14.

38 The ICAO requirements concerning fatigue risk management are contained in Annex 6 to the Convention on International Civil Aviation, Chapter 4.10 and related Appendixes 2 and 8, http://www.icao.int/safety/fatiguemanagement/Fatigue%20Management%20Docs/FM_Annex%206%20Pt1.pdf. Further details are included in paragraphs 72 to 76 of the Explanatory Note to the EASA Opinion 04/2012.

39 EASA CRD 2010-14 Appendix III. Scientists Reports: Provision of Scientific Expertise to submit an assessment of the NPA on Flight Time Limitations.

39 "Scientific and Medical Evaluation of Flight Time Limitations" Moebus Study, EASA, Cologne, 30 September 2008.

41 Block time is flight time, defined as the time between an aeroplane first moving from its parking for taking-off until all engines are stopped after landing. See also Annex 1.

Protection against cumulative fatigue with recurring rest periods

The EU-OPS requirement for a 36-hours weekly rest including two local nights is commonly accepted by stakeholders as an effective mitigating measure. This view is also corroborated by scientific evidence[42].

The effectiveness of this provision depends however on how well the second local night's sleep is protected. The Moebus report (p. 26) considers that the possibility to curtail the second night contained in EU OPS (OPS 1.1110 2.1. in fine) is not sufficiently protective (see paragraph 132 of the EASA NPA 2010-14).

Protection against fatigue of crew on night flights with extension

Currently the maximum flight duty period (FDP) overnight for 1-2 sectors[43] is 11 hours and includes the possibility for an extension twice per week. This extension is limited depending on the number of sectors and the Window of Circadian Low (WOCL) encroachment[44]. For a 2-sector FDP starting at the most unfavourable time of the day, the limit including extension is currently set to 11:45 hours, which can be insufficient to ensure alertness of the crew (see paragraphs 88-89 of the EASA NPA, section 5.3.2(h) of the EASA 2010 RIA and sections 2.4.5 and 6.1.4 of the EASA 2012 RIA).

Mitigating measures against fatigue effects of disruptive schedules

Crew duty schedules are considered 'disruptive' if they comprise an FDP or a combination of FDPs starting, finishing during or encroaching on any portion of the day/night which disrupts the sleep opportunity during the optimal sleep time window. Current rules mitigate against this only by reducing FDP which encroaches the WOCL, but do not foresee compensating the cumulative effects of curtailed sleep. Scientists[45] have recommended that this protection should be increased.

2.2.3. Clarification of the existing rules

Experience with the implementation of EU-OPS has indicated that there are still differences in how the existing rules are interpreted and implemented. Stakeholders have called for further guidance on the interpretation of certain rules in order to improve legal certainty and to provide a reliable technical expertise to address complex technical issues. Self-regulation by the industry has not been effective, given the complexity of the topic and the different operational models. The main areas requiring clarifications include:

1. a common formula for calculating an allowable maximum daily FDP[46] (see paragraph 79 of the Explanatory Note to the EASA Opinion 04/2012 as well as in section 2.4.2 of the EASA 2012 RIA), and

2. clarification of the rules governing commander's[47] discretion (see Box 2 under section 4.2 and paragraph 102 on the EASA NPA 2010-14).

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42 See EASA 2012 RIA, paragraph 2.4.4., page 7.

43 In the context of FTL rules 'sector' means a single flight, including take-off and landing.

44 The Window of Circadian Low (WOCL) is the period in which the urge to sleep is especially strong (particularly between two and six in the morning). And the restorative effects are also much better if one sleeps during this period.

45 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.

46 Current rule contains the criteria to be used for calculating maximum FDP. However, changing the order of applying the different criteria may lead to variation in results of allowable FDP.

2.3. MOST AFFECTED STAKEHOLDERS

This initiative will have effects on the following stakeholders:

1. Aircrew members[48], because of the potential effect on aviation safety and on their working conditions;

2. the air carriers performing commercial air transport[49], because of the potential effect on aviation safety, as well as certain administrative and economic implications of complying with different rostering requirements;

3. the Member State competent authorities, because of potentially burdensome additional administrative processes and enforcement resulting from the adaptation to the revised provisions;

4. the travelling public, because of the main objective of the legislation is ensuring aviation safety.

2.4. BASELINE SCENARIO

The Commission has the legal obligation to transfer the FTL rules into the EASA regulatory framework and thus 'do nothing' is not a feasible policy choice. Therefore, the transfer of current EU FTL rules to the EASA regulatory framework without any change is considered as a baseline scenario. This would imply repealing in full Annex III to Regulation (EEC) No 3922/91, as amended by the EASA Basic Regulation, and transferring the corresponding provisions to the EASA Basic Regulation via a Commission Regulation. Some FTL areas would remain under the competence of Member States but EASA would be able to provide more support to Member States for the interpretation and implementation of the rules. EASA would also have full competence for inspecting the implementation of the FTL rules in Member States.

However, the following issues would remain:

1. some air safety risk situations could arise, given that the rules would not reflect the latest scientific knowledge and operational experience;

2. incompatible or contradictory rules would remain in place in different Member States resulting in legal uncertainty and uneven level playing field for EU airlines and aircrew;

3. the legal mandate to verify the compatibility of current FTL rules (as explained in section 2.2.2) with the latest scientific and operational knowledge and with international developments in the field of aircrew fatigue will not be fulfilled;

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47 The commander is the chief pilot. He/she is allowed to decide extending the planned FDP or rest in order to respond to unforeseen delays, after consultation with other crew members and providing safety is not compromised.

48 Roughly 50.000 flight crew and 120.000 cabin crew in the EU.

49 Roughly 300 EU air operators pertaining to different operating models: Legacy Carriers (LEG), Low Cost Carriers (LCC), Charters (CHR), Regional Operators (REG) and All Cargo (CAR).

4. probability of certain air safety risk situations caused by unclear or inadequate rules could increase due to (a) the current economic downturn (b) increasing air traffic density in most congested areas[50].

Concerning (a) above, economic difficulties of airlines tend to have a direct impact on their safety performance mainly due to the extra costs the demanding aviation safety rules impose on labour productivity. Regarding (b), as for all aviation safety issues, it can be assumed that the absolute number of safety related incidents is correlated with traffic volumes. Thus, for the baseline scenario, it is assumed that the problems identified will remain or increase in proportion to traffic volume, despite current economic downturn.

2.5. SUBSIDIARITY

2.5.1. Legal base

The legal base of EU aviation safety legislation is set out in Article 91(1)(c) of the TFEU, which gives the Union competence for laying down "*measures to improve transport safety*" under the ordinary legislative procedure.

EU action in the field of aviation safety was introduced in Regulation (EEC) No 3922/91 (amended by Regulation (EC) No 1899/2006 – EU-OPS) and in the EASA Basic Regulation. These Regulations entrusted the Commission to adopt the necessary measures via the regulatory comitology procedure with scrutiny.

2.5.2. Necessity and EU added value

Aviation safety is one of the EU's common policies. Air carriers operate transnationally throughout the EU and carrying passengers of different nationalities. Pilots and cabin crew duty rosters include a combination of flight and rest periods taking place often in different Member States. It is therefore important for air carriers, aircrew as well as passengers to have harmonised rules where possible to avoid incompatible or contradictory rules in different territories and ensure equal safety standards for the passengers on board.

The action proposed is based on already existing EU legislation and responds to the request prescribed in EU-OPS and the EASA Basic Regulation to revise the FTL rules. There is also a general support among stakeholders for further clarification of the rules at the EU level and for the revision of such rules in light of latest scientific evidence and knowledge.

The technical adjustments proposed to existing rules respect the repartition of competences between Member States, Commission and EASA established by the Treaties and the EASA Basic Regulation. To ensure a proportionate approach, a mixture of hard and soft law elements is used. This allows for certain flexibility in the way the rules are implemented, while the core principles of the legislation are always respected (see Box 1 in section 2.2.1).

[50] The capacity crunch at the EU's largest airports, including London Heathrow, London Gatwick, Paris Orly, Paris Charles de Gaulle, Milan Linate, Düsseldorf, Amsterdam, Madrid, Munich, Rome Fiumicino and Vienna, is mentioned on paragraphs 5-10 to the Communication from the Commission "Airport policy in the European Union - addressing capacity and quality to promote growth, connectivity and sustainable mobility", COM(2011) 823 final.

3. OBJECTIVES

3.1. GENERAL OBJECTIVE

In application of Article 91 of the TFEU, the European Union shall "*lay* down *measures to improve transport safety*". In this context the general objective of the initiative is to contribute to avoiding aircraft accidents, and of related fatalities, through the improvement of the existing FTL system.

3.2. SPECIFIC OBJECTIVES

The general objective of ensuring an appropriate level of aviation safety can be divided into three specific objectives (SO) which correspond to the problem drivers identified in section 2.3. These objectives are detailed in the table below.

Table 1: Link between the problem drivers and specific objectives

Problem drivers	Specific objectives
The fragmentation of the aviation safety legislative framework	SO1: Ensuring a coherent and uniform EU safety legislative framework
Adaptation according to scientific and international developments	SO2: Having state of the art EU FTL rules
Clarification of the existing rules	SO3: Improving clarity and ensure common interpretation of the current EU FTL legislation

No operational objectives have been defined, as these would relate to the individual FTL rules, which have been assessed in EASA RIAs.

3.3. CONSISTENCY WITH HORIZONTAL POLICIES OF THE EUROPEAN UNION

The proposal is consistent with the overall policies of the EU and with the objective of transport safety improvement enclosed in the TFEU. Moreover, by improving aviation safety in Europe, it contributes to the attainment of the wider objectives of the Europe 2020 and the goals of the European Commission 2011 White Paper on Transport[51], which set the goal for the European Union of becoming the safest region of the world for aviation transport. In addition, the objectives of this initiative are fully compliant with relevant fundamental rights and principles as embodied in the Charter of Fundamental Rights of the European Union.

[51] Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system, COM (2011)144.

4. POLICY OPTIONS

4.1. GENERAL APPROACH TO POLICY OPTIONS

The core policy options considered in this IA are:

> **Option 1:** Transfer current EU FTL rules to the EASA regulatory framework without any change (the baseline scenario)
>
> **Option 2**: Transfer revised EU FTL rules to the EASA regulatory framework

While option 1 simply follows the legal obligation to recast the legislation, option 2 would propose also to revise the rules allowing the full range of problems to be addressed and to achieve all the specific objectives as outlined in the previous chapters.

The core proposal for revised rules was developed by EASA with the help of Rulemaking Group OPS.055. Several alternatives were developed for individual rules, based on the fatigue hazards identification and risk management approach mentioned in section 2.3.2. The possible choices were discussed in an iterative process with the Group as well as with the broader public through the Notice of Proposed Amendment 2010-14 and the Comment-Response Document 2010-14. The final result of this long consultation process is the EASA rule proposal as included in the Opinion 04/2012.

Throughout the long consultative process the aim was to take into account the position of different stakeholders and look for the most efficient solutions, while ensuring the achievement of the core safety objectives. However, it has not been possible to find commonly accepted solutions in all issues. Aircrew unions have been particularly critical as regards the EASA proposals, requesting more protection or legal certainty concerning a number of issues. Key elements of these suggestions made by aircrew representatives are considered below as the sub-options of option 2. The other issues are considered addressed as explained in section 1.2.3.

4.2. DESCRIPTION OF POLICY OPTIONS

Option 1 (the baseline): *Transfer of current EU FTL rules to the EASA regulatory framework without any change* (described in section 2.4)

Option 2: *Transfer of revised EU FTL rules to the EASA regulatory framework*

This option would encompass option 1 and a revision of the rules to take into consideration latest scientific and international developments and operational experience in order to strengthen the current safety net without implying significant additional burdens to the industry.

The technical revision under option 2 could be done in various ways as discussed under the different sub-options.

Option 2.1: *Follow fully the* EASA *recommendations contained in its Opinion 04/2012*

This means that all recommendations made by EASA, and which reflect the consensus achieved with most of the stakeholders, would be included in the legislative proposal. These recommendations include three types of changes to the existing rules responding to the three problems described under sections 2.3.1 to 2.3.3 above: legislative fragmentation; adaptations according to scientific and international developments; and clarifications of existing rules.

The main recommendations made by EASA are explained in Box 2 below.

Box 2 - The main recommendations made by EASA (see table 1 of EASA 2012 RIA)

Legislative fragmentation

EASA recommends to transfer the existing FTL rules to the EASA legislative framework as well as to include common rules for the five areas currently left to Member States. These recommended rules are based on scientific and operational knowledge and are presented in a proportionate manner, in line with the incremental approach to harmonisation described in Box 1. The proportionality is respected mainly by establishing general principles in legislation and providing detailed possible means of compliance under soft law, in order to accommodate to the extent possible different approaches at national level and diverse operational models. The key features of such rules are as follows:

1. Rest compensating time zone differences: hard law providing definition of acclimatisation and maximum FDP for crews on an unknown state of acclimatisation.
2. Duty extension due to in-flight rest: criteria to be considered for FDP extension and definition of rest facilities are included in hard law, while tables allowing calculating maximum FDP are in soft law.
3. Split duty: criteria to be considered for FDP extension are included in hard law and other details in soft law.
4. Standby: soft law covers maximum duration of standby and of related FDP, accounting of standby outside the airport for cumulative duty.
5. Reduced rest arrangements: conditions for its use, including fatigue risk management, are in soft law.

More details on these issues are provided in section 6.1 of the EASA 2012 RIA.

Adaptations according to scientific and international developments

Fatigue risk management

According to risk management principles developed by ICAO, EASA recommends to introduce in the EU FTL system a mandate to provide fatigue management training in airlines as well as the possibility of implementing a fatigue risk management system for these FTL schemes impact of which on crew fatigue is unknown.

Protection against cumulative fatigue with maximum flight time and duty limitations

Following the best practices described in section 2.3.2, EASA recommends to introduce, in addition to the existing 28-day limit of 190 hours, a 14-day limit of 110 hours.

Concerning the current cumulative limit of 900 flight hours per calendar year, EASA recommends a new gliding limit of 1.000 flight hours in ‘any 12 consecutive calendar months’, based on scientific recommendations.

Protection against cumulative fatigue with recurring rest periods

Following scientific recommendations and positive feedback received from stakeholders, EASA recommends deleting the current possibility of curtailing the second local night of the weekly rest (i.e. starting new duties at 04:00 of the 2nd night if the weekly rest is at least 40 hours).

Protection against fatigue of crew on night flights with extension

EASA has taken qualitative account of various scientific papers[52] of the most protective EU national rules[53] and of operational experience in order to propose more protective rules in this area, using four mitigating measures to be included in soft law:

1. reducing the maximum FDP to 11 hours for night flights;
2. asking operators to apply fatigue risk management principles for night duties longer than 10 hours;
3. applying stricter FDP limits during the time window going between 19:00-06:00 (for example, under EU-OPS 11:45 hours are allowed between 22:00- 04:59, while EASA recommends 11 hours between 19:00 and 05:59); and
4. requiring additional rest (weekly rest of 60 hours instead of 36) in case of disruptive schedules.

Mitigating measures against fatigue effects of disruptive schedules

Following scientists advice, EASA recommends establishing additional rest periods in case of consecutive disruptive schedules. This countermeasure should avoid the accumulation of fatigue resulting from the concatenation of curtailed night sleep.

Clarification of the existing rules

To ensure common understanding of maximum allowable daily FDP, EASA recommends a clear FDP table in function of reporting time and number of sectors flown. The most restrictive interpretation of the current formula is followed.

EASA also recommends clarifying that the possible extension of FDP decided by the commander, in case of exceptional circumstances, shall apply to the maximum daily FDP applicable to the particular flight.

Option 2.2: *Depart from the EASA recommendations for some technical parameters as suggested by certain stakeholders*

Although the direction of the changes recommended by EASA under option 2.1 has been widely accepted by the stakeholders, a number of potential issues have been expressed by the representatives of crew members during the consultation process[54] (see section 1.2.3) . The analysis in this IA focusses on three core issues, which would represent a deviation from the EASA proposal only in specific areas, while accepting the rest of the proposal. The sub-options presented below are not alternatives to one another as they cover different aspects of the EASA proposal.

Option 2.2.a: *FDP for night flights: 10 hours vs 11 hours*

Current EU FTL rules allow up to 11:45 hours of flight duties during the night. As explained under option 2.1, EASA recommends more protective EU rules via a combination of four mitigating measures.

Despite these safety improvements, ECA and ETF maintain that the EASA proposal is not sufficiently protective and that the maximum FDP during night should be set at 10 hours. These unions also support their statement with a

[52] Powell et al., 2008; Spencer & Robertson, 1999; Spencer & Robertson, 2000; Spencer & Robertson, 2002.

[53] UK CAP 371.

[54] See ECA and ETF position papers under https://www.eurocockpit.be/stories/20101109/eca-position-on-easa-opinion-on-flight-crew-licensing and http://www.itfglobal.org/etf/etf-press-area.cfm/pressdetail/6939/region/2/section/0/order/1.

scientific study[55]. Consequently this sub-option suggests limiting FDP at nights to 10 hours, instead of 11 hours as foreseen in Option 2.1.

Option 2.2.b: *Disruptive schedules: only one definition vs two options for the Member States*

The aim of the EASA proposals concerning disruptive schedules is to provide additional rest in comparison with current rules, including by increasing weekly rest from 36 to 60 hours. In addition a local night requirement is recommended by EASA under the soft law, in case of transition from *'late finish/night duty'* to *'early start'*. This is proposed to mitigate cumulative fatigue in case of several flight duties starting early in the morning or ending late in the evening.

All stakeholders and Member States agree with providing this additional rest. However there has been a disagreement what should be considered as an '*early start*', as there is a cultural element in the perception on that. For example, 6:00 may be considered as early in certain countries and not in others. This fact is also supported by one of the authors[56] of the existing studies concerning disruptive schedules, who recognised that cultural differences related to the notion of *'early'* and *'late'* could require some adjustment. Such differentiation seems to be essential for some EU counties, such as Germany, and for charter operators, which perform an important part of their flights early in the morning.

That is why EASA proposed in its opinion that Member States chose between two time bands (‘early type’ or ‘late type’) within the concept of disruptive schedules, according to their cultural habits. More details are provided in section IV of Annex II of the Explanatory Note to the EASA Opinion 04-2012.

Aircrew unions, airlines and Member States have expressed divergent views on this topic. In particular, aircrew unions insisted on a single definition of disruptive schedules, based on the ‘late type’ approach. This expectation is reflected in this sub-option 2.2.b.

In contrast, airlines and some Member States would prefer to keep the two options, which would allow them to choose the type of disruptive schedule more adapted to their flight schedules – as foreseen in option 2.1.

Option 2.2.c: *Standby outside the airport[57]: 8 hours buffer vs 8 hours buffer in combination with 18 hours maximum time awake*

Standby outside the airport is currently governed by widely different national rules and no scientific studies have addressed the topic. One of key elements to be defined in standby outside the airport is the maximum duration of the FDP that can be carried out after being called out. In some Member States no reduction of the FDP is applied and other Member States reduce the FDP that can be carried out after a certain time of standby has elapsed (see EASA 2010 RIA, section 7.3, table 35 for a sample of provisions applied currently in Member States).

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55 Spencer, MB, Robertson, K., The Haj operation: alertness of aircrew on return flights between Indonesia and Saudi Arabia, Civil Aviation Authority A, United Kingdom, 1999.

56 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.

57 Also called *home standby* or *other standby*.

EASA recommends, under certification specifications (soft law), the criteria to be used for calculating the maximum FDP when a crew member is called from standby outside the airport, by setting an 8-hour buffer after which any time spent on standby should be deducted from the maximum FDP.

Aircrew unions consider that the buffer rule recommended by EASA is insufficient and proposed to complement the buffer with an 18-hour cap of awake time. In other words, awake periods which would result from the combined duration of standby outside the airport and assigned FDP, should not exceed 18 hours at the end of an FDP. This suggestion is considered in the IA as sub-option 2.2.c.

5. ANALYSIS OF IMPACTS

5.1. APPROACH TO THE ASSESSMENT OF IMPACTS

This chapter focusses on the assessment of impacts of the changed rules compared to the current legislation.

Main **social impacts** are related to **safety**. The assessment of safety impacts could not be based on statistical analysis of accidents and incidents as the number of accidents and incidents has been statistically insignificant and irrelevant. Therefore the assessment of the safety impacts is based on the review of scientific evidence and operational experience.

For the review of scientific evidence, the members of the OPS.055 rulemaking group provided EASA with a comprehensive list of scientific studies, reports and evaluations, which includes more than 200 items[58]. EASA reviewed the evidence in these studies and discussed with the group to what extent they are applicable to different options. One basic issue encountered in this process was that no single study existed assessing the effectiveness of the set of existing rules as a whole and under all types of operations. Nevertheless, there is a broad body of scientific literature on individual requirements.

Other social impacts identified by EASA include effects on **working conditions**, such as work-private life balance, number of rest days, conditions for in-flight rest. There are also potential effects on **health** to be considered, as the proposal concerns cumulative fatigue, rest periods and night sleep.

As regards **economic impacts**, FTL schemes limit the way crews can be scheduled by airlines in order to mitigate fatigue hazards. The mitigating measures include duty and flight time limits, minimum rest rules and other constraints. The most immediate economic effects induced by these measures are on **crew productivity**, e.g. the number of crew members required for a certain operation (see Annex 3 of this IA and sections 4.2 and 5 of the EASA 2010 RIA).

It should be noted, that the way in which different FTL schemes impact on airlines depends to a large extent on the flight routes and rosters they operate, which in return depend on the business model. Therefore, a meaningful analysis of economic impacts has

[58] C.f. Annex 9 of the EASA RIA

to differentiate between the business models. However, it has not been feasible to use the real schedules and rosters of all European airlines or even to have a representative selection of them, due to the lack of access to such roster data. Therefore the approach taken is to analyse, mostly in qualitative terms, the potential impacts on a 'model airline' for each business model. To complement this relatively high level analysis, the conclusions have been peer reviewed by experts and extensively discussed with stakeholders.

The derived impacts on **competitiveness** of air operators are also considered.

None of the options is expected to have significant **environmental impacts** and therefore environmental impacts are not discussed

5.2. SAFETY IMPACT

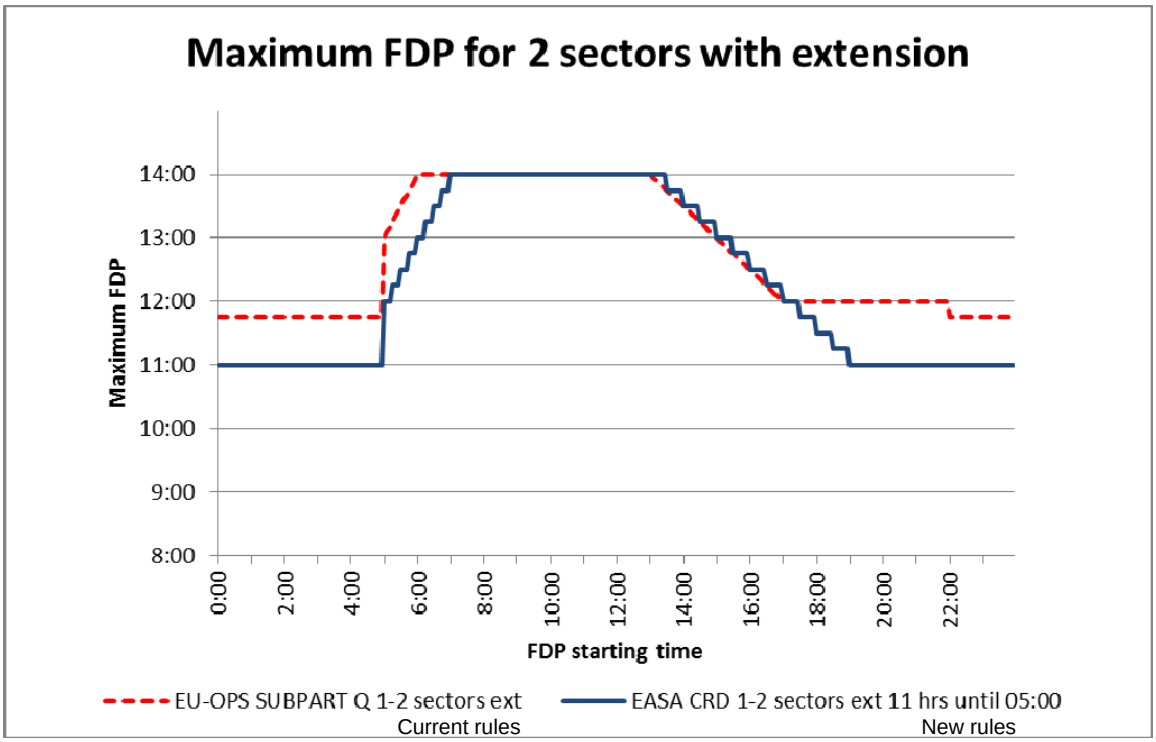
5.2.1. Option 2.1

All proposals made by EASA, and described under option 2.1., aim at increasing safety, either due to a more coherent and widely applied legislative and administrative framework, more protective rules (for example, in terms of additional rest or reduced duty periods) or due to the clarification ensuring the correct way of attaining the safety aim.

Firstly, the transfer of the current rules to the EASA legislative framework will allow a better monitoring by EASA of the correct implementation, and thus also contribute to an increased safety level. The rules proposed to address the five areas left today to Member States, provide a level of safety protection equivalent to the most protective national regimes and would enable to provide more safety protection in those Member States which currently have less protective rules or no rules at all.

Secondly, the revised rules according to the EASA proposals are in most cases also more protective than national limits. For instance, the provisions *for fatigue risk management* can increase the awareness of safety risks and enhance the ways to manage these risks by taking appropriate actions. For example, based on fatigue risk management principles, an airline could manage risks, in case of subsequent night duties, by limiting the FDP of the first and last days to 8-9 hours, or limiting the number of sectors to 2. Another example of more protective rules are the additional rest periods and the prohibition of extended FDP during nights (see Figure 2 below).

Figure 2. Maximum allowable FDP with extension



Thirdly, as regards clarification of the existing rules, the most restrictive interpretations have been used for the design of the daily FDP table and for the possibility of a FDP extension by the commander. These clarifications would provide for a safety improvement.

A list of expected safety gains is presented in pages 26-28 of the Explanatory Note to the EASA Opinion 04/2012.

5.2.2. Options 2.2.a to 2.2.c

Option 2.2.a*: FDP for night flights: 10 hours vs 11 hours*

The analysis of existing studies (see EASA 2010 RIA, section 5.3) indicated that allowing flight duty extensions for FDPs during the most unfavourable time of the day beyond 11 hours, may pose a safety risk. At the same time the comparison of night duties of different length with SAFE (System for Aircrew Fatigue Evaluation[59]) showed that further shortening the maximum night FDP below 11 hours does not always improve the alertness scores at the end of night FDPs. In addition, no sufficient evidence was found in safety occurrence data that the limit of 11 hours at night (as proposed by option 2.1) poses an imminent safety risk. The scientific study referred to by the unions[60] is dated back to 1998 and concerns a very specific combination of circumstances, which do not justify a general 10 hours limit to all EU night flights.

[59] See EASA NPA 2010-14 pp. 46, 47 for more detailed information

[60] Spencer, MB, Robertson, K., The Haj operation: alertness of aircrew on return flights between Indonesia and Saudi Arabia, Civil Aviation Authority A, United Kingdom, 1999. The study concerned a triangular rotation (Solo City, Indonesia - Batam, Indonesia – Jeddah, Saudi Arabia) of an crew involving substantial time zone crossing with suboptimal rest periods.

Therefore, EASA concluded that, although night flights need to be managed carefully applying fatigue management principles, a prescriptive limitation and cut off point at 10 hours would be excessive and not necessarily result in improved alertness scores.

Option 2.2.b: *Disruptive schedules: only one definition vs two options for the Member States*

Currently, the applicable national provisions of only one Member State (the United Kingdom) offer additional protection against disruptive schedules by limiting the number of consecutive early starts. EASA recommends extending such additional safety protection to the entire EU.

The concept of disruptive schedules of *'early type'* and of *'late type'* has been proposed by EASA in order to cater for cultural differences in Member States in terms of awake times. However, in view of protecting the additional rest provision related to this concept, EASA is requiring Member States to choose the same disruptive schedules model (i.e. early or late) for all commercial air transport operators under its oversight, in accordance with the average rising habits of their people.

Most Member States have expressed their intention to choose the definition of disruptive schedules wished by aircrew, given their cultural habits.

There is no evidence showing that retaining two options would compromise safety or that retaining only one option would increase the level of safety.

Option 2.2.c*:* *Standby outside the airport: 8 hours buffers vs 8 hours buffer in combination with 18 hours maximum time awake*

Provisions on standby outside the airport are currently left to the discretion of Member States. A number of options were discussed during the work of EASA's rulemaking group and assessed for their effectiveness (see EASA 2010 RIA, section 5.11). EASA Opinion 04/2012 introduced a new rule proposing limitation of the duration of this type of standby to 16 hours and an 8-hour buffer after which any time spent on standby should be deducted from the maximum FDP. This harmonises a wide range of different practices applied in Member States (see EASA 2012 RIA, section 6.1.6. for further details).

However, there is a possibility that applying the rules as recommended in the EASA Opinion 04/2012 could result in a situation where aircrew could land an aircraft after long awake times exceeding 18 hours, when their alertness could be significantly decreased. Therefore, the additional measure to introduce an 18-hour cap for the combined duration of (a) wakefulness during the standby outside the airport and (b) FDP could bring a safety improvement compared to the measures proposed in the EASA Opinion 04/2012. However, these cases are exceptional, basically concerning long FDPs started at the end of long standby periods and should normally be avoided via general risk management measures.

5.3. IMPACTS ON WORKING CONDITIONS

5.3.1. Option 2.1.

While recalling that the proposed measures are developed solely to ensure achievement of the safety objectives and thus are not aimed at regulating working conditions (see section 1.1.), the EASA proposal will imply a reduction or duty times, an increase of rest

and will improve the quality of in-flight rest facilities. This should also imply positive effects on working conditions and general well-being and work–life balance. For example, Directive 2000/79/EC lays down minimum rest per month and year and maximum duty per year, while EU-OPS also contains minimum rest per week and day, as well as maximum duty per week, month and year. In addition, EASA recommends complementing the current FTL rules with additional rest twice a month and following more fatiguing duties as well as to establish a cumulative duty limit per 14 days and 12 consecutive months. On the other hand, proposed provisions for FDP extensions due to in-flight rest (not allowing certain long extensions if in-flight rest facilities are not optimal) will improve well-being especially among European cabin crew members.

Overall, the impacts on working conditions are expected to be limited, but positive as the proposed changes represent a gradual and well balanced revision of the current rules. However, it is not possible to measure such impact on working conditions as the majority of airlines operate today in line with collective labour agreements which, in some cases, are more favourable than FTL rules[61].

In addition, removing national differences in FTL regulations of EU Member States in five so far non-harmonised areas will also help avoiding any social dumping based on FTL.

5.3.2. Options 2.2.a to 2.2.c

It is expected that options 2.2.a and 2.2.c would slightly improve the working conditions as certain duty and rest periods are more favourable.

Option 2.2.c could slightly improve the working conditions of the crew by giving the guarantee that the maximum awake time of 18 hours is more strictly controlled.

5.4. ECONOMIC IMPACT

5.4.1. Option 2.1

The EASA 2012 RIA (section 6.1) analysed in detail the most important economic impacts generated by the technical elements of Option 2.1 compared to current rules.

Overall, given that the proposed changes to the FTL rules are mostly incremental and carefully balanced (as a result of a thorough technical preparation process) the impact on **operational costs** in terms of crew productivity is estimated to be low. This has been confirmed by the fact that most of the air operators support the EASA proposal.

The effects of the changes in the complex set of different FTL parameters would vary depending on (a) the differences in operations and cost structure of the various types of operators and (b) existing national rules in non-harmonised areas of national rules. In addition, existing collective labour agreements should be taken into account.

[61] Some stakeholders claim that the proposed FTL provisions will incentivise operators to reduce the protection provided by CLAs arguing that the new technical safety rules are enough. This does however, not fall under the competence of a safety regulation and should not be relevant for addressing the specific objectives of this IA.

EASA has prepared a comparative qualitative analysis of different operational models[62] of airlines and identified the main cost factors. The results are summarised in Table 2 below.

Table 2: Summary economic impact

Key to the scores applied:

-- -	decreasingly negative
0	neutral or negligible
+	positive

Issue	Economic Impact				
	Legacy airlines	Low cost carriers	Charter operators	Regional operators	Cargo operators
The fragmentation of the aviation safety legislative framework					
Rest to mitigate the effects of Time-zone crossing	-	0	-	0	-
Duty extension due to in-flight rest	0	0	- -	0	0
Split Duty	+	0	+	+	+
Standby	+	+	+	+	+
Reduced rest	+	+	+	+	+
Adaptation according to scientific and international developments					
Requirements on fatigue management training	-	-	-	-	-
Rolling limit on flight time	0	0	- -	0	-
Rolling limit on duty time per 14 days	-	0	-	-	-
Minimum recurrent rest	-	0	-	-	-
Duty extension night flights	-	0	- -	-	- -
Additional rest due to disruptive schedules	-	0	-	-	-
Clarification of existing rules					
Flight Duty Periods table	-	0	-	-	-
Minimum standards for accommodation during airport standby	- -	-	-	-	-

A negligible operational cost impact is expected for low cost airlines as they operate with stable rosters and with a low share of night operations.

For legacy, regional and cargo operators a limited cost impact is expected due to the additional safety requirements, as showed in table 2. Some costs could arise mainly due to the restrictions concerning night flights (especially for cargo operators) and new cumulative duty and rest rules depending on their national legislation or CLAs. Training on fatigue risk management should not increase too much costs, as it would only complement or reinforcing the training on fatigue which is already mandatory.

Charter operators may feel more impacted than the other categories of operators, especially due to the recommended exclusion of the use of economy seats as an in-flight rest facility, the ban of FDP extensions without in-flight rest for night flights and the additional rest requirement to compensate for disruptive schedules. The effects on Charter operators are stronger due to their particular business model, given that they

[62] For this IA airline operations have been categorised as 'Legacy Airlines' with a business model based on a hub operation, 'Low Cost Carriers' operating point-to-point flights, 'Charter Operators' carrying out seasonal flights to holiday destinations, 'Regional Operators' connecting regions with a hub airport or operating between regional airports and 'Cargo Operators' transporting cargo. It should be noted that most individual operators have characteristics of more than one type of operation.

depend on production peaks in holiday seasons during which aircraft utilisation and crew productivity have to be brought to a maximum. This means relatively more duty and flying hours during the night and more disruptive schedules for crew members.

In general, it can also be expected that operational costs would be higher concerning standby outside the airport in particular in the countries which currently have no limitations on standby.

Limited **implementation costs** were identified for all operators in order to put the new rules in practice, notably the newly created additional limits on cumulative duty. This implies changes in the way operators manage the rosters.

Additional **administrative burden** for airlines and authorities will be minimal, as only minor additional reporting obligations are proposed in comparison with the current situation (for example, airlines are requested to keep records of assigned home bases). Very limited **enforcement costs** are expected for national aviation authorities and EASA, because no new oversight obligation is included. It is also possible that the clearer and further developed rules proposed, in particular for the five areas currently left to Member States, will facilitate oversight of compliance and thus could reduce enforcement cost. Fatigue risk management training should significantly raise awareness about the risks and consequences of non-respecting the legal limits[63] and improve the enforcement of existing legislation.

Option 2.1 is expected to **maintain the competitiveness** of European operators, despite some cost increases due to the safety improvements. Importantly, more harmonised rules would improve the level playing field in the EU and therefore contribute to fair competition between the European operators.

5.4.2. Options 2.2.a to 2.2.c

The economic impact in terms of **operational costs of Option 2.2.a** (*FDP for night flights: 10 hours vs 11 hours*) for European carriers would be substantial and threaten international competitiveness as well as economic viability of certain routes.

For legacy carriers the key economic impact would be on routes connecting central Europe with the eastern part of the United States. The map below shows selected key commercial routes affected by a further reduction of FDP at night.

[63] It was mentioned in section 2.1 that some incidents and accidents were caused by crew operating outside the legal FTL limits.

Figure 3: Selected key commercial routes affected by FDP at night

Timetable data shows that roughly 80% of flights to European countries with an approximate FDP of 10 to 11 hours are currently scheduled overnight. This includes many of the most actively flown routes from North America (New York, Washington, Boston, Toronto, Montreal). Currently, these routes can be operated with an un-augmented crew if the maximum FDP during the night is 11 hours. If this limit is reduced to 10 hours the crew would have to be augmented resulting in an increase of around 10 to 15 % of crew costs, depending on the type of operation and number of cabin crew.

Not only would international competitiveness of European operators be negatively affected, but also the relative competitiveness between European operators: operations out of western airports might still be able to operate with minimum crew (i.e. 2 pilots) while operations from Central and Eastern Europe would need to augment (i.e. 3 pilots).

An additional reduction of the night FDP would also have a significant negative impact on charter operations. According to these operators, 60% of affected FDP above 9 hours are overnight. These routes to leisure destinations are typically flown with a low frequency (only once per day) and single aisle (narrow body) aircraft. This means that augmentation is technically not feasible due to the aircraft type. Due to the limited number of flights, a possible solution with a crew outstation is also economically not viable. A significant number of connections are thus at risk to disappear entirely or be taken over by non-European carriers.

Option 2.2.b *(Disruptive schedules: only one definition vs two options for the Member States)* is expected to raise significantly **operational costs** for certain operators and distort **competition** by limiting the rule to one definition of disruptive schedules.

Airline schedules are typically adapted to a number of circumstances. Firstly, they must respect airports' opening hours (i.e. in Germany the majority of airports are closed during the night). Secondly they must be commercially sellable, meaning that passengers must be willing to travel at a given departure time, considering that they also need to reach the airport at that time of the day. Thirdly, for hub operations, the schedules must fit in with the network. These aspects result in different preferred departure windows in the early morning in the different European airports. Allowing only for one definition (rather than

allowing both a 'late type' and an 'early type' schedules) would consequently have a negative impact on operators, but the scale of impacts would differ by Member States.

Option 2.2.c (*Standby outside the airport: 8 hours buffers vs 8 hours buffer in combination with 18 hours maximum time awake*) is expected to generate limited operational costs in comparison with option 2.1., since the extra wakefulness cap is supposed to come into effect in only extreme situations where standby shifts are too long or airlines and aircrew do not implement the existing general obligations of fatigue management. However, this option could be challenging to implement, given that it is not straightforward to establish in advance the actual awake time of a pilot.

6. COMPARING THE OPTIONS

Table 3 below summarises the assessment of impacts presented in chapter 5 and provides the comparison of each option to the baseline in terms of effectiveness, efficiency and coherence.

The table compares the relative impacts within a row, but not the relative importance of the different rows.

Table 3: Comparison of options

Key to the scores applied:

--- -	decreasingly negative
0	neutral
+ … +++	increasingly positive

	Option 1 Transfer of current rules	Option 2 Transfer and revision of rules*			
		2.1 As recommended by EASA	2.2 As recommended by EASA, but with following variation:		
			a. FDP for night flights	b. Definition of disruptive schedules	c. Standby outside the airport
SUMMARY OF IMPACTS					
Social Impacts:					
Safety	0	+	+	+	+/++
Working conditions	0	+	++	+	+/++
Economic impacts:					
Operational costs	0	-	- -	- -	-
Implementation costs	0	-	- -	-	-
Level playing field between EU operators	0	+	- -	-	+
Competitiveness vis-à-vis 3rd country airlines	0	-	- - -	-	-
Enforcement costs	0	+	+	++	0/+
Administrative costs	0	-	-	-	-
Environmental impacts	0	0	0	0	0
EFFECTIVENESS/ EFFICIENCY/ COHERENCE					
Effectiveness:					
SO1: Ensuring a coherent and uniform EU safety legislative framework	0	+	+	++	+
SO2: Having state of the art EU FTL rules	0	++	+	+	++

	Option 1 Transfer of current rules	Option 2 Transfer and revision of rules*			
		2.1 As recommended by EASA	2.2 As recommended by EASA, but with following variation:		
			a. FDP for night flights	b. Definition of disruptive schedules	c. Standby outside the airport
SO3: Improving clarity and ensure common interpretation of the current EU FTL legislation	0	+	+	+	+
Efficiency	0	+	--	-	+
Coherence	0	++	+	+	++

The comparison of options presented above shows that all options considered would imply improvement in safety levels.

Option 2.1 is expected also to ensure level playing field between operators and facilitate enforcement, given that rules are more homogeneous and clearer. More stringent safety rules would inevitably bring along additional operational costs, however these are modest and are considered by air operators being proportional to the expected safety gains. The negative impact on competitiveness vis-à-vis 3rd country operators is linked to increase of the operational costs. Some additional implementation costs (revision of rostering arrangements) and administrative costs (marginal changes in reporting) are similar to all options. The impact on working conditions is expected to be limited but positive.

Options 2.2.a and 2.2.b provide more positive outcome in terms of working conditions, however the evidence on their additional effect on safety is inconclusive. At the same time there are clear negative impacts in terms of operating costs. Option 2.2.a is also more expensive to implement given that changes in schedules (even cancelling some flights) and rostering (might need more crew members) for the long distance flights will be substantial. Both options would distort the level playing field between the EU operators as their impacts differ by Member States. In addition, Option 2.2.a weakens the competitive position of European airlines vis-à-vis the third country carriers for long distance flights. Option 2.2.b could have slight additional positive impact on enforcement costs as it allows for a more coherent approach to rules. At the same time it would limit the opportunity of operators to adjust their schedules to opening hours of the different airports and customs of local population, thus having negative impact on their business opportunities.

Option 2.2.c presents quite similar results similar to the option 2.1 with marginal potential gains in terms of safety and working conditions. The main benefit of this option in comparison to 2.1 is that it provides additional legal clarity, while not applying extra cost. For these reasons, option 2.2.c might be slightly more efficient than option 2.1. However, the rule of 18 hour wakefulness cap could be difficult to implement, as actual awakening time would be problematic to supervise.

Options 2.1 and 2.2.c are also coherent with the legislative framework of aviation safety rules, as they focus on safety issues in a proportionate manner and respect the established framework of co-existence of hard and soft law.

In conclusion, option 2.1 ranks well in terms of effectiveness and efficiency, and is therefore a preferred option. It achieves all specific objectives in a cost-effective manner. Option 2.2.c has the same benefits as option 2.1 with some additional safety assurance. However, according to EASA recommendations the rules for standby outside the airport are provided with the means of soft law and will therefore not be included in the

Commission legislative proposal. Nevertheless, based on the conclusions of this analysis, the Commission would advise EASA to consider additional limit, as proposed in option 2.2.c, while developing relevant certification specifications. Options 2.1 and 2.2.c are also **coherent** with the legislative framework of aviation safety rules, as they focus on safety issues in proportionate manner and respect the established framework of co-existence of hard and soft law.

7. MONITORING AND EVALUATION

Once a rule is in place it is crucial to monitor if the objectives are achieved in an effective and efficient manner. It is also necessary to ensure that any subsequent external developments, which may require a reassessment of those objectives, are identified. To this end, EASA is tasked with monitoring effectiveness and suitability of the EU air safety legislation. EASA conducts this task based on a number of external and internal feedback loops which may again be fed into the process as new proposals. These feedback loops include:

- the European Aviation Safety Plan,
- Safety Recommendations received from Accident Investigation Boards,
- EASA's consultative bodies (composed of representatives from Member States and industry),
- third country NAAs,
- ICAO and
- EASA standardisation.

The core indicators of progress towards meeting the specific objectives are presented in the table below:

Table 4: Monitoring indicators

Specific objectives	Core indicators	Source
SO1: Ensuring a coherent and uniform EU safety legislative framework	1. Positive feedback from stakeholders 2. Limited number of questions of interpretation concerning the revised rules	Committee, citizens, EASA standardization and consultative bodies
SO2: Having state of the art EU FTL rules	1. Reduced number of incidents and accidents related to aircrew fatigue 2. Positive feedback resulting from the monitoring programme run by EASA	Accident and incident reports, results of FTL monitoring programme run by EASA
SO3: Improving clarity and ensure common interpretation of the current EU FTL legislation	1. Positive feedback from stakeholders and resulting from standardisation inspections performed by EASA 2. Limited number of questions of interpretation concerning the revised rules	Committee, citizens, EASA standardization and consultative bodies

In the case of FTL, the Commission legislative proposal will request EASA to launch a monitoring and research programme to further investigate aircrew fatigue and performance. This should allow inter alia addressing the issue of inconclusive evidence on the safety impacts of option 2.2.a. Such a programme will be run by EASA and

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 will include assessing the impact on aircrew alertness of at least the following:

- duties of more than 13 hours at the most favourable time of the day;
- duties of more than 10 hours at less favourable time of the day;
- duties of more than 11 hours for crew members in an unknown state of acclimatisation;
- duties including a high level of sectors (more than 6);
- on-call duties such as standby or reserve followed by flight duties ; and
- disruptive schedules.

The proposed monitoring system will not bring along additional administrative burdens to the stakeholders as it will largely rely on data already collected by airlines and by National Aviation Authorities.

No specific ex post evaluation arrangement is foreseen at this stage, given the thorough monitoring process proposed above and continuous interactions with stakeholders.

ANNEX 1

Abbreviations and glossary of technical terms used

A. LIST OF ABBREVIATIONS

AEA	Association of European Airlines
AGNA	EASA Rulemaking consultative body composed of EU Member State's representatives. Its name was recently changed to RAG, mentioned also below.
CRD	EASA's Comment response document
DG EMPL	European Commission's Directorate-General for Employment
DG MOVE	European Commission's Directorate-General for Mobility and Transport.
DG SANCO	Social Affairs and Inclusion and DG Health and Consumers
EASA	European Aviation Safety Agency
EBAA	European Business Aviation Association
ECA	European Cockpit Association
ELFAA	European Low Fares Airline Association
EP	European Parliament
ERA	European Regions Airline Association
ETF	European Transport Workers' Federation
EU OPS	Regulation (EC) No 1899/2006, amending Regulation (EEC) No 3922/91
FDP	Flight duty period, which means a period that commences when a crew member is required to be at the airport to commence a flight or a series of flights and finishes when the aircraft finally comes to rest and the engines are shut down, at the end of the last flight on which he/she performs duties as aircrew member
FTL	Flight time and duty limitations and rest requirements contained in current EU safety rules concerning aircrew fatigue
IA	impact assessment
IACA	International Air Carrier Association
IASG	Impact Assessment Steering Group
ICAO	International Civil Aviation Organisation
LS	European Commission's Legal Service
NAA	National Aviation Authority
NPA	EASA's Notice of proposed amendments

RAG	EASA rulemaking consultative body composed of Member States. It was called AGNA until March 2012.
SG	European Commission's Secretariat General
SSCC	EASA rulemaking consultative body composed of industry representatives from the European and Non-European Manufacturers Industry, Aerodromes and Aerodromes Group, Aerodrome Personnel, European Aviation Personnel (Flight Crew, Cabin Crew, Maintenance Personnel and Medical Personnel), Civil Air Navigation Services, European Commercial Aviation Operators, European General (Non-Commercial) Aviation Operators, European Training Industry, Small and Regional Aerodromes, Air Traffic Controllers, Europe Air Sports and European Maintenance Industry
TFEU	Treaty on the Functioning of the European Union
WOCL	human body window of circadian low

B. GLOSSARY

Block time of block flight time	means flight time, defined as the time between an aeroplane first moving from its parking for taking-off until all engines are stopped after landing. It is shorter than the concept of Flight Duty Period defined below
Disruptive schedule'	An aircrew member's duty/rest roster which disrupts the sleep opportunity during the optimal sleep time window of the human body clock by comprising flying duties starting early in the morning, finishing late in the evening or encroaching the night
Duty period	period which starts when an aircrew member is required by an airline to commence a duty (which may be a flight duty, standby or administrative work) and ends when that person is free of all duties
Local night	a period of 8 hours falling between 22:00 and 08:00 local time
Operational model	airline operations model, which can be categorised as follows: 'Legacy Airlines' with a business model based on a hub operation; 'Low Cost Carriers' operating point-to-point flights; 'Charter Operators' carrying out seasonal flights to holiday destinations; 'Regional Operators' connecting regions with a hub airport or operating between regional airports; and 'Cargo Operators' transporting cargo.
Roster	Programme of duties and rest periods of an individual aircrew member prepared by the airline and notified to the concerned crew member
Schedule	Programme of flights conducted by an airline including the precise timing and sequence of such flights and destinations

Sector or flight sector	A single flight, comprising a take-off and subsequent landing
Standby	a pre-notified and defined period of time during which an aircrew member is required by the airline to be available to receive an assignment for a flight or other duty without an intervening rest period. Two types of standby are possible, as follows: (a) airport standby, means a standby performed at the airport, which may lead to an assignment of duty; (b) other standby, means a standby either at home or in a suitable accommodation
Standby outside the airport or home standby	Standby periods spent outside the airport at a location which is not defined by the airline but decided by the aircrew member (normally the private domicile of the crew member)

ANNEX 2

Overview of consultation process

EASA consultation

EASA conducted a lengthy and comprehensive assessment and consultation process before presenting its conclusions to the Commission concerning the revision of the current EU FTL rules.

This process was composed o three phases:

1. Preparation of the Notice of proposed amendments (NPA)

   All over the process, EASA was assisted by a group of experts (called rulemaking group and review group OPS055) representing all stakeholders, as explained in page 8.

   The first EASA Rulemaking group meeting took place on 4 December 2009. In total eight plenary meetings of the EASA Rulemaking group were during one year on the following dates: 04 December 2009; 19-20 January 2010; 2-3 March 2010; 24-25 March 2010; 13-14 April 2010; 25-26 May 2010; 21-22 September 2010; 3-4 November 2010.

   In May 2010 a dedicated 'RIA Subgroup' of the EASA Rulemaking group was set up with the view to defining the elements to be covered by the Regulatory Impact Assessment (RIA). This subgroup met four times on 11-12 May 2010; 8-10 June 2010; 12-13 July 2010 and 25-26 August 2010

   The output of this 1st phase was the publication on 20.12.2010, on EASA's NPA website, of the EASA NPA 2010-14, which contained an explanatory note, a RIA and a draft legislative proposal.

2. Preparation of the comments response documents (CRD)

   All comments received by EASA following the publication of the NPA were reviewed, analysed for their relevance to the proposed changes and summarised per rule paragraph.

   The summaries of comments, related responses and the proposed revised rule text were incorporated into the CRD. The draft CRD text was discussed with the group of experts during seven meetings between April 2011 and November 2011. Eleven meetings of the EASA Review Group took place on the following dates: 18-19 April 2011; 17-19 May 2011; 7-8 June 2011; 14-15 September 2011; 19-20 October 2011; 9-10 November 2011; 29 November 2011;

   As an output of this phase, the CRD was published on 18 January 2012. Individual comments were published as Appendix II of CRD 2010-14. A revised draft text was also published by EASA as part of its CRD.

3. Preparation of the Opinion

The same review of the comments, as described under phase 2 above, was done with comments submitted after the publication of the CRD, which were summarised and reasons for their acceptance or rejection explained in the Explanatory note to the Opinion 04/2002.

The draft Opinion was discussed with the review group on 15-16 May 2012, 27 June 2012 and 5 September 2012.

The Opinion was published on 1 October 2012, accompanied by a RIA and a draft legislative proposal.

In addition to the consultation described above, EASA also held the following targeted consultations:

1. On 24 October 2010 EASA consulted its rulemaking consultative body composed of Member States (AGNA) during a special meeting.

2. On 13 February 2013 EASA consulted its rulemaking consultative bodies composed of Member States (RAG) and industry representatives (SSCC) in a special workshop on standby provisions.

3. Additional separate meetings of EASA with stakeholders took place as follows:

   - with ECA on 10 March 2010, 25 October 2011, 22 February 2012 and 26 April 2012 in Cologne;

   - with ETF on 3 November 2010 in Cologne and 14 January 2013 in Brussels;

   - with ECA and ETF on 24 September 2010, 28 November 2011, 14 May 2012, 4 September 2012 and 14 February 2013 in Cologne;

   - with Unite (UK Cabin Crew union) on 22 January 2013 in Heathrow;

   - with Ryanair on 1 February 2011, 13 January 2012 and 16 November 2012 in Cologne;

   - with AEA on 20 April 2011 and 23 March 2012 in Brussels and 4 June 2012 in Cologne;

   - with four Member States on 2 February 2011 in Paris;

   - with Irish CAA by video conference on 11 October 2012.

Commission's consultation

The Commission undertook the following targeted consultations:

1. The EASA Committee was consulted on the EASA proposals on 24-25 October 2012, 19 February 2013 and 24 April 2013. The results of this consultation were reflected in a report which was made public via the *Comitology Register*[64].

[64] http://ec.europa.eu/transparency/regcomitology/index.cfm

2. A number of meetings were held by the Commission with stakeholders and with the EP in order to explain the EASA proposals and the Commission's process and to gather views. These include the following:

- with EP TRAN committee on 8 October 2012 and 19 March 2013;
- with EP EMPL committee on 19 March 2013;
- with MEP Simpson on 15 November 2012;
- with MEP El Khadraoui on 17 December 2012 and 5 March 2013;
- with MEP Cercas and Steinruck 22 April 2013;
- with MEP Grosch on 9 April 2013;
- with ECA and ETF on 26 November 2012, 17 December 2012, 18 December 2012, 14 January 2013, 22 January 2013, 7 February 2013, 14 February 2013, 4 March 2013, 23 April 2013;
- with representatives from the French union SNPNC/FO on 7 December 2012;
- with AEA on 31 October 2012, 19 March 2013 and 26 April 2013;
- with IACA on 19 April 2013 and 26 April 2013.

ANNEX 3

Affected operators and crew

In order to estimate the magnitude of the impacts generated by the revised FTL rules it is crucial to know the overall number of operators and crew affected.

No integrated data base currently exists for this kind of information as the European competency in the field of aviation safety for operations has only recently been created.

Table 5 gives an overview of the sources used by EASA and the resulting estimate. The estimated figures are derived by extrapolating the available data from ICAO with the traffic figures from Eurocontrol and then adjusting it to the overall number of flight and cabin crew reported by the European Commission's Study 'Effects of EU Liberalisation on Air Transport Employment and Working Conditions'[65]. This study is based on questionnaires and interviews with the National Aviation Authorities and is thus considered as the best source currently available on crew figures in Europe. An update of this study is being currently finalised by the Commission. Due to the need to finalise that study, it is not considered appropriate to revise the estimate presented in Table 3 at this stage.

Table 5: Sources and estimate of number of crew in EASA countries, 2008

Business model	Ascend April 2012		Eurocontrol 2011		Estimate for 31 EASA countries		
	Number of operators	Number of aircraft	Total number of flights (EU27)	Share of total flights	Pilots and co-pilots	Cabin crew	Total
Legacy	37	2,042	4,928,218	59.2%	24,608	76,587	101,195
Low-cost	28	1,103	2,081,418	25.0%	8,817	16,005	24,822
Business	509	2,102	630,305	7.6%	6,161	9,454	15,615
Charter	71	458	371,728	4.5%	4,145	9,663	13,808
All-cargo	70	477	319,270	3.8%	1,720	0	1,720
Regional	75	980			5,358	4,149	9,507
Total	**790**	**7,162**	**8,330,939**	**100.0%**	**50,810**	**115,858**	**166,668**

[65] European Commission (2009): Effects of EU Liberalisation on Air Transport Employment and Working Conditions, p. 35 and 41. The figure given is from 2007, which is considered the upper limit for 2008 due to the effects of the financial crisis.