ETSC Position on Flight Time Limitations

Introduction

The European Transport Safety Council (ETSC) recognises that fatigue is a significant contribution to accident risk across the transport modes. It also recognises that the management of fatigue is a complex process and that the proposals from the European Aviation Safety Agency represent a comprehensive attempt to resolve this problem. However, it believes that the proposals do not fully and properly reflect the scientific evidence that should underpin fatigue management. Nor do they fully incorporate the scientific evidence which EASA itself commissioned.

In response to this, ETSC therefore decided to convene a group of experts to review both the evidence and the EASA proposals. The experts consulted have considerable research knowledge of the effects of fatigue in general and its impact in aviation in particular. The group comprised:

Rob Gifford, Chairman, Gifford Partnership and former PACTS Director,
Torbjorn Akerstedt, Stockholm University and Karolinska Institute,
Philippe Cabon, Université Paris Descartes,
Simon Folkard, Université Paris Descartes and Swansea University,
Alexander Gundel, Alertness Management Freelancer (formerly with the German Aerospace Center),
Ries Simons, European Society of Aerospace Medicine and TNO,
Mick Spencer, formerly QinetiQ, Farnborough.

ETSC[1] is grateful to them for the time that they gave to this paper which reflects the discussions held with them and their recommendations for future action.

What contributes to fatigue?

Fatigue can be exacerbated by three key elements. These are:

- Circadian component – the time of day which the human body cannot ignore

[1] ETSC member ARCD considers that EU decision-makers should take more account of the detailed recommendations contained in previous studies commissioned by EASA, in particular the report from Moebus Aviation (2009).

- Sleep related component – the amount and quality of sleep, time since the last period of sleep and sleep inertia (period since waking)
- Task related component – time-on-task, the nature of the task itself, e.g. the number of sectors flown.

Each of these needs has to be considered as part of a fatigue management process. The question for lawmakers is the extent to which the Flight Time Limitations (FTL) proposals from EASA have managed to take these adequately into account.

Maximum Flight Duty Periods across the Day

ETSC believes that Table 1 on Page 10 of the Draft European Commission Regulation has created an overly-complicated approach to managing maximum flight duty periods (FDP). While welcoming the proposal that FDPs should be reduced across sectors, ETSC would argue that the division of the day into somewhat arbitrary periods of several hours, half hours and quarter hours creates a structure that is over-complicated and may lead operators to attempt to structure rotas to achieve the maximum number of hours rather than the safest level of service. At an individual flight crew level, there is no clear evidence to suggest that someone can fly for 15 minutes more at 0415 compared to 0414. What seems to have been created in this table is a complicated scheduling model rather than a sensible way of managing fatigue, with the implication that there is scientific evidence to support such a breakdown when it does not exist. What is the most important point to bear in mind is that the time of day effect needs to be reflected fully in any table, with the longer duty periods allowed for FDPs starting in the morning (for more detailed recommendations see the table below).

The consensus of scientific evidence, however, is clear. Several scientific reports commissioned by EASA over the past years concluded that "FDPs for minimum crew should not exceed 10 hours overnight" since any overnight period would impinge upon the Window of Circadian Low (WOCL). At the same time, evidence provided by M Spencer from Haj flights and reprinted in the EASA response document of January 2012 suggests that under certain circumstances FDPs of up to 14 hours might also be acceptable for morning starts from 0800.

Based on the scientific evidence available, ETSC would suggest that the maximum daily FDP should be reconstituted as follows

Start FDP	0500 – 0600	11 hours
	0600 – 0700	12 hours
	0700 – 0800	13 hours
	0800 – 1100	14 hours
	1100 – 1400	13 hours
	1400 – 1700	12 hours

1700 – 2000 11 hours
2000 – 0500 10 hours

At the same time, in line with the evidence submitted previously to EASA[2], potential extensions to the FDP by 1 hour on two occasions in a week should not be permitted.

In response to the evidence cited in both the scientific reports commissioned by EASA and in EASA's response, ETSC would argue that the proposal to reduce FDPs only after the second sector is also flawed. Both Bourgeois-Bougrine (2003a)[3] and Powell (2008)[4], in studies based on the real-world experience of short-haul pilots and two-pilot operations, conclude that sector reductions should begin after the first sector, not the second as proposed by EASA. ETSC would strongly support this change to the EASA proposals. In addition, Bourgeois-Bougrine (2003b)[5], based on a questionnaire study of short- and long-haul pilots' self-report of the effects of fatigue, concludes that for short-haul pilots fatigue is exacerbated by both prolonged duty periods over multi-sectors and successive early starts. This research further supports the need to look again at the sector reduction issue.

Extensions of FDP due to in-flight rest

ETSC recognises that it is possible to extend FDPs if suitable rest facilities are made available to flight crew. Simons and Spencer (2007)[6] concluded that:

- Short in-flight sleep periods are an effective measure to maintain alertness and performance at sufficient levels throughout a long-haul flight,
- Alertness and performance are better maintained after sleep periods of longer duration,
- The benefit of sleep periods of longer duration has to be balanced against the risk of sleep inertia and,
- The principal factors influencing the efficiency of in-flight sleep are the time of day, the length of the rest period and the quality of onboard sleep facility.

However, what is also crucial is to ensure that the quality of rest is as undisturbed as possible as EASA recognises in its definitions of rest facilities. ETSC welcomes the inclusion of clear definitions of Class 1 and Class 2 rest facilities. It also welcomes the decision by EASA not to permit extensions to

[2] Final report ''Scientific and Medical Evaluation of Flight Time Limitations'' – TS. EASA.2007.OP.08, Moebus Aviation, 2008

[3] Bourgeois-Bougrine S, Cabon P, Mollard R, Coblentz A & Speyer J J (2003a) *Fatigue in aircrew from short-haul flights in civil aviation: the effects of work schedules*, Human Factors and Aerospace Safety: An International Journal 3(2)

[4] Powell D, Spencer M, Holland D & Petrie K (2008), *Fatigue in two-pilot operations: implications for flight and duty time limitations*, Aviation, Space and Environmental Medicine, 79 (11)

[5] Bourgeois-Bougrine S, Cabon P, Gounelle C, Mollard R, & Coblentz A (2003b) Perceived fatigue for short- and long-haul flights: a survey of 739 airline pilots, Aviation, Space and Environmental Medicine, 74 (10)

[6] Simons M & Spencer M (2007), Extension of flying duty period by in-flight relief, TNO Report TNO-DV 2007 C362, TNO Defence and Security, Soestreberg, Netherlands

FDPs when rest is taken in an economy seat. However, it wishes to express serious reservations about the inclusion of Class 3 rest facilities which have no pitch requirement built into the definition.

As Simons and Spencer (2007)[7] pointed out, the quality of sleep achieved in a bunk or Class 1 seat is significantly less than would be achieved in a normal bed. Research also suggests that, on average, flight crew sleep for between 25% and 33% of the allotted rest period when in a bunk or Class 1 seat. These figures then deteriorate still further when rest is taken in other facilities. Sleep in Class 2 seat is only 75% of that achieved in a bunk while that in a Class 3 seat is only 33%.

In its proposals, EASA has based its extensions to FDPs on a basic approach. ETSC believes that any extensions to FDPs should be grounded in the science surrounding the quality of sleep achieved when taking in-flight rest. It would urge EASA to base its extensions on the proposals in Simons and Spencer's report which called for extensions to FDPs to be permitted on the following basis:

- 75% of the rest period for rest taken in a bunk or Class 1 seat,
- 56% of the rest period when resting in a Class 2 seat and,
- 25% of the rest period when resting in a Class 3 seat.

ETSC recognises that this may make roster scheduling more complex than the simplistic allocation of addition periods of an hour. However, these superficially attractive simple time breaks do not necessarily correspond to the quality of rest achieved within them. A new approach supported by fatigue risk management systems represents a firmer way forward.

In addition, it should also be remembered that, in terms of benefitting from any rest period, it should be the pilot landing who should determine when to take priority within the rest period.

Fatigue Risk Management Systems

ETSC welcomes the support expressed by EASA for the use of fatigue risk management systems (FRMS). Evidence from Air New Zealand shows that an FRMS can be implemented in an operating airline and make a real difference with the percentage of pilots self-reporting fatigue "at least once a week" falling from nearly 70% in 1993 to below 40% in 2010[8].

In this context, it is therefore of some concern that the emphasis within the EASA proposals is on the use of FRMS to justify or support going beyond the

[7] Simons M & Spencer M (2007), *Extension of flying duty period by in-flight relief*, TNO Report TNO-DV 2007 C362, TNO Defence and Security, Soestreberg, Netherlands

[8] Powell D (2011), accessed via http://www.frmsforum.org/cms_media/files/10b_david_powell.pdf?static=1

FTL requirements. Paragraph 73 of Opinion 04/2012 comments that FRMS "should be integrated" within the overall safety management of a company. This is a positive encouragement to adopt this approach. However, the following paragraphs undermine this support, referring to FRMS being compulsory if an operator wishes to reach the maximum FDPs or being a "useful tool to demonstrate compliance".

ETSC believes that this is a misinterpretation of the benefits that an active FRMS can bring. Given the publication by ICAO of guidance to both operators and regulators on FRMS, ETSC would urge that these be written into the final opinion and Commission Regulation to ensure that EASA is at the forefront of international best practice.

Other issues

The adoption by operators of a more active approach to FRMS should help to minimise the impact of fatigue. However, it is important also to recognise a number of shortcomings that remain within the EASA proposals.

First, on the issue of standby (whether at home or at the airport), sleep taken under these circumstances is always shorter and of poorer quality. It is therefore essential that the accommodation provided at an airport is comparable with those provided in-flight. Ideally, such accommodation would be the equivalent of the Class 1 rest facility. It is also important to note that there have been no studies into the impact of standby on fatigue.

For this reason, more far-reaching recommendations based on specific research are not possible at this stage and further research on standby should be included in the list of Article 2 of the cover Regulation. Further, taking the precautionary principle into account, if a standby interferes with a normal sleep pattern, it should count towards the FDP, and long times on duty and awake, when combining with home standby and FDP, should be avoided to exclude the potential high levels of fatigue at the end of such duty days.

Secondly, on disruptive schedules, ETSC welcomes the commitment by EASA for further research in this area. It is also essential that flight crew be given adequate protection via FRMS from the impact of disruptive schedules. For example, it should not be possible for an early start to be followed by a duty that overlaps the WoCL. A period of rest offers a minimum level of protection that should be built upon. Finally, it should not be possible to schedule more than three successive disruptive schedules unless the impact of these has been properly and thoroughly assessed.

Thirdly, on the commander's discretion, while welcoming the requirement to report use of discretion above one hour to the national authority, ETSC would suggest that 28 days is too long a period for such report to be submitted. The UK CAA currently requires such reports to be submitted within 14 days. Allowing a reporting period of four weeks may result in a larger number of

extensions occurring in future than are currently identified at present. EASA must ensure that a suitable process for monitoring the occurrence of these incidents and the justification for them is put in place. In addition, a more active use of FRMS would help to minimise the impact of such events.

Involvement of Scientists in Policy-making

ETSC notes that elements of the policy-making process have been informed by the involvement of expert scientific advisers. This is welcome given the complexity of the topic and the difficulties of legislating in this area across the European Union. That said, it is also clear that the views of the scientists were incorporated at a fairly late stage in the drafting process and that several of their recommendations may not have been fully understood by the Agency. It would be infinitely preferable for expert advice to be sought at the beginning of the legislative process rather than at the end of it. ETSC hopes that EASA will draw appropriate conclusions from it.

Conclusion

ETSC recognises the need to establish robust FTL arrangements covering the entire EU. It is to be hoped that as a result of these, safety for citizens will be enhanced and not compromised. Some aspects of the current proposals will clearly assist in this process. However, without a robust FRMS becoming widespread throughout the EU and without improvements to the overall pattern of FDPs and some other provisions as outlined above, such an outcome seems less likely. ETSC would therefore urge the Commission, EU Member States and the Parliament to think carefully before giving the final approval to the current proposals.

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The European Transport Safety Council (ETSC) is a Brussels-based independent non-profit making organisation dedicated to reducing the numbers of deaths and injuries in transport in Europe. The ETSC seeks to identify and promote research-based measures with a high safety potential. It brings together 47 national and international organisations concerned with road safety from across Europe.