

A fatigue survey of European Pilots

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Project Management

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I. Introduction

In May 2023, the European Cockpit Association (ECA) approached aviation safety management experts Baines Simmons for support from their Fatigue Risk Management specialists to design and analyse a Europe-wide fatigue survey for pilots. The aim of the fatigue survey was to:

- ▶ proactively identify signs and contributors of fatigue, prior to the busiest part of the summer season, and
- ▶ publicly share the results to aid in the industry's continual improvement processes. This improvement is not only for the operators, but also to inform the National Aviation Authorities (NAAs) and EASA's oversight and standardisation activities.

2. Methods

2.1. Survey design process

Prior to approaching Baines Simmons, the ECA wrote a draft version of the survey questions, which Baines Simmons reviewed. The ECA's requirements for the survey were:

- ▶ The survey must be quick to complete. This meant:
 - Limiting it to approximately 5 questions in length, plus demographics
 - Questions were multiple choice
- ▶ The survey should provide a 'snapshot' of potential fatigue focus areas, including:
 - Use of Commander's Discretion
 - Roster stability
 - Indicator of fatigue levels
 - The effectiveness of fatigue risk management in the airline
- ▶ The survey should not identify any individual airlines, as it is aimed at exploring fatigue across Europe. However, nation of AOC was captured to align with the aim to inform NAAs and EASA of potential improvements in their areas of oversight
- ▶ The survey should be distributed prior to / at the very beginning of the busy summer season
- ▶ The survey should be open for approximately 3 weeks
- ▶ The survey results should be made available to the industry to enable continuous improvement in fatigue risk management, and to the national and European authorities to inform and enhance their oversight

The full list of survey questions and answer options is provided in appendix I.

2.2. Survey distribution

The final survey questions were designed in collaboration between the ECA and Baines Simmons. The ECA then distributed and promoted the survey, using the online platform Zoho. One 'generic' link was created, which could be accessed by any individual to complete the survey.

The survey was promoted by National Airline Pilot Associations affiliated to the ECA, with links available on the ECA website, and across social media platforms.

The survey open period was the 1st-22nd July 2023. During the open period, the ECA monitored response rates from the different member countries, and provided updates to the National Associations for further promotional efforts. This means that the survey open period, and the 4-week look-back period used in several questions cover the 'ramp-up' to the busy summer season, rather than the peak of operations.

Participation in the survey was voluntary, and whilst the questions were mandatory, pilots could leave the survey at any time and responses submitted prior to that point would be saved.

2.3. Survey analysis

The analysis contained within this report was undertaken by Baines Simmons. During the analysis process, Baines Simmons discussed all the results with the ECA, to provide additional context to results, and identify key 'headlines'. The ECA also completed its own analysis, through the production of a PowerBI dashboard, placing results into an interactive format allowing filtering and drilling down into the grouped data.

Where there were less than 100 responses within either Home Base or Country of AOC responses, these were grouped into an 'Other' category to aid in the interpretation of the results. The countries in the 'Other' category for each of these questions are shown in Appendix 2.

The demographics of the pilots responding to the survey are shown in Appendix 3.

3. Results and discussion

In total, 6,893 pilots responded to the survey¹. For context, whilst there is some uncertainty about the number of licensed pilots work in Europe, estimates prior to the Covid-19 pandemic ranged between 50,000-66,000 licensed pilots. However, this number is expected to have changed since due to the Covid-19 pandemic. The 6,893 pilots provided answers to all questions, although for most questions the small number of ‘don’t know’ or ‘not applicable’ answers were excluded from the graphs presented to aid in clarity of interpretation. The 6,893 responses is a higher number of responses than initially expected by the ECA, and reflects a large database for the analysis.

Initial screening of the data identified that there was consistency in answers between questions for the individual responses. This means that Pilots who indicated elevated fatigue in one answer, were not indicating low levels of fatigue in another. This increases the confidence in the dataset.

Please note, the term ‘operators’ in this report is used as a general term to describe European Commercial Air Transport (CAT) operators, who employ (through any means) the pilots who responded to this survey.

To aid in the interpretation of the results in this section, appropriate relevant regulations and/or guidance material have been quoted.

3.1. Managing fatigue risk through the management system

All operators are required to have a management system² which enables the identification of hazards and the management of their associated risks³. Fatigue is a safety hazard, and fatigue risk must be managed appropriately by all operators, as described in the EU Commission Regulation Operator Responsibilities outlined in ORO.FTL.110⁴, and according to the flight time limitations. The Operator Responsibilities outline the performance-based requirements that operators must be able to demonstrate as part of showing how they are managing fatigue risk.

Fatigue poses a significant flight safety risk, and so must be managed effectively through the management system. Meeting the Operator Responsibilities outlined in ORO.FTL requires operators to identify suitable and appropriate flight and duty limitations for themselves, rather than simply following those outlined in the regulation. For many, this may result in a greater degree of buffering, shorter duties, or longer rest periods than is outlined in the prescriptive limitations. This reflects the different levels of fatigue risk within the different operations. All operators must identify and manage fatigue risks, not only those with an ‘approved FRMS’ or those seeking to work outside flight and duty time limitations.

Pilots were asked for their opinion on the effectiveness of fatigue risk management at their airline, and the results for the whole database are shown in figure 1.

¹ A further 1379 Pilots began the survey, but did not answer any of the 7 main survey questions, and so were excluded from the survey database at the screening stage.

² ORO.GEN.200(a) requires operators to ‘establish, implement and maintain a management system’

³ ORO.GEN.200(a)(3) states that the management system must include ‘the identification of aviation safety hazards entailed by the activities of the operator, their evaluation and the management of associated risks, including taking actions to mitigate the risk and verify their effectiveness’

⁴ Regulation (EU) No 83/2014. Annex III (Part-ORO) Subpart FTL: Flight and duty time limitations and rest requirements

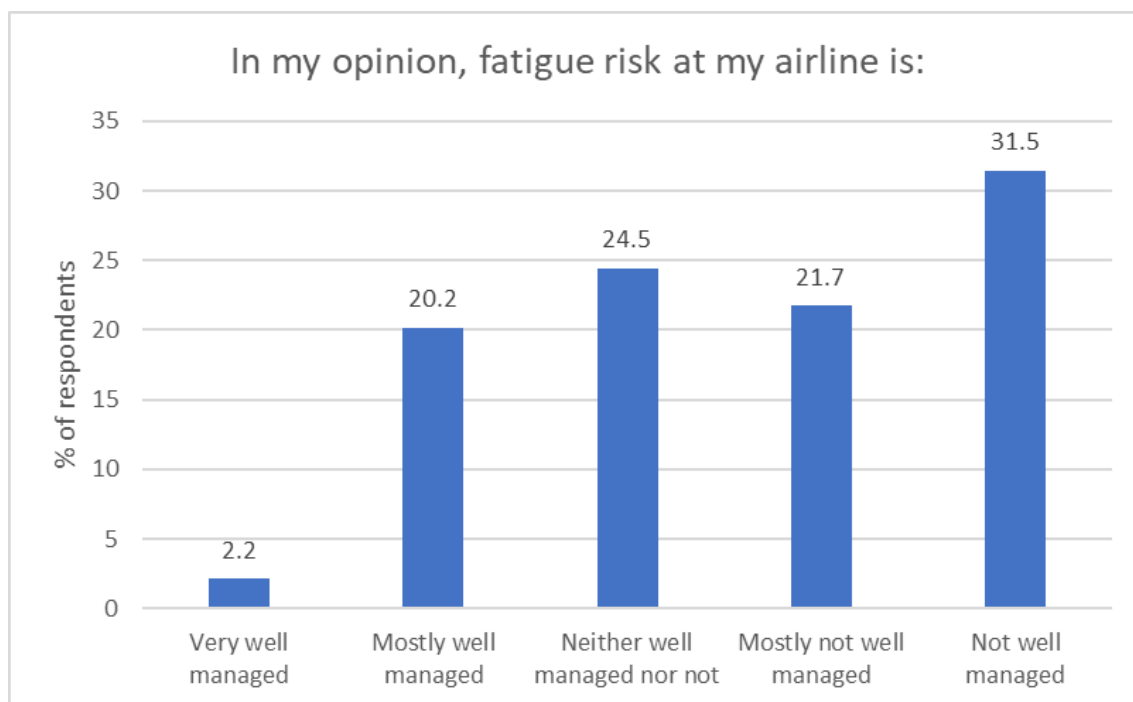


Figure 1: N=6813 responses. A further 80 pilots selected 'don't know' (n=57) or 'not applicable' (n=23) and have been excluded from the graph. Data labels show the % of pilots selecting each option.

53.2% (n=3625 pilots) responded that fatigue risk was either 'mostly not well managed' or 'not well managed' within their airline. This compares with only 22.4% (n=1522) responding that fatigue risk was 'very well managed' or 'mostly well managed'.

This varies between AOC countries, as shown in figure 2.

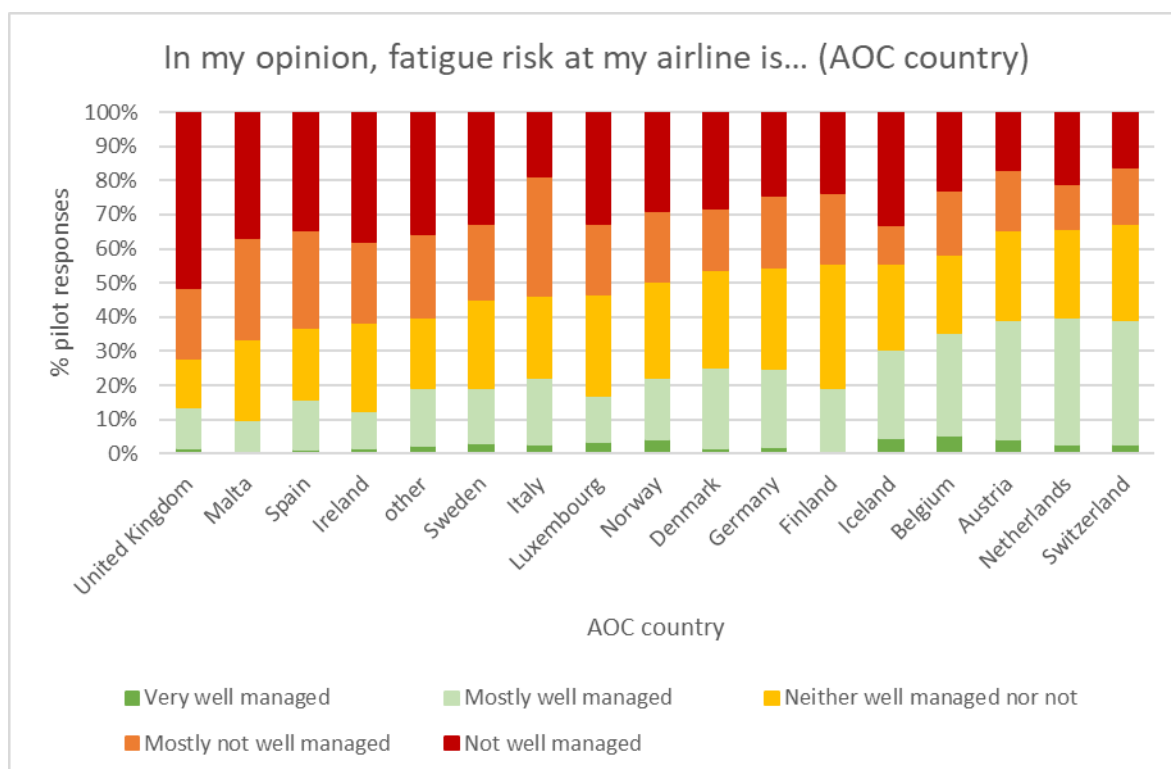


Figure 2: N=6813 respondents. Excluded from the graph are 80 responses for 'Don't know' (n=57) and 'Not applicable' (n=23). AOC countries ordered by the greatest combined proportion of responses for 'Mostly not well managed' and 'Not well managed'

The UK (72.0%), Malta (66.5%), Spain (63.1%) and Ireland (61.7%) were the countries where the highest proportion of crew indicated FRM was mostly not or not well managed. At the other end of the scale, Switzerland (32.8%), the Netherlands (34.3%) and Austria (34.4%) had the lowest proportions of crew who indicated that fatigue was mostly not or not well managed at their airline.

What guidance is there for NAAs in relation to fatigue risk management?

The performance-based approach for much of fatigue risk management requires competence and confidence from regulators to provide effective oversight. In order to promote standardisation and increase competence in NAAs, EASA published the FTL/FRM Inspector's checklist in 2019, and updated it in 2022⁵. The list provides checks that the Inspector should undertake, along with example metrics to expect from the operator.

One example of the checks, which relate to the operator responsibility ORO.FTL.II0(b) is:

- ▶ *Check if the operator's documented rostering policy and procedures are tailored to the type and scope of operation and fatigue risk exposure*
- ▶ *Check if the applicable legal requirements and operator's rostering policy and procedures are reflected in the operator's roster planning tool/software*
- ▶ *Check if planned FDPs allow for buffers to the maximum permitted FDPs*
- ▶ *Check if the operator provides for specific mitigation measures in its rostering policy to address fatiguing duties such as: FDPs with extensions; FDPs with WOCL encroachment; training flights, consecutive duties etc., as applicable*
- ▶ *Check if the operator measures the effectiveness of those mitigation measures*
- ▶ *Check if the operator uses performance metrics to monitor and measure flight duty periods in terms of their duration, workload, WOCL encroachment and consecutiveness.*⁶

For an operator to demonstrate that they are effectively managing fatigue, their inspector should be satisfied that all the elements in the first two sections of the FTL/FRM Inspector's checklist are fully implemented.

3.2. Fatigue reporting

Operators are able to provide either a stand-alone fatigue reporting system, or make provisions to ensure that fatigue can be effectively reported through the internal safety reporting system (e.g. through Air Safety Reports, ASRs)⁷. An effective fatigue reporting system is essential to allow the identification of fatigue levels and contributors to fatigue, and when used proactively by pilots, to report potentially fatiguing situations before they occur. Without an effective reporting system, the airline is unlikely to have an accurate picture of fatigue in the operation, limiting their ability to manage fatigue risk by implementing effective mitigations.

To be effective, a fatigue reporting system must be accessible, easy to use, and crew must be competent in completing fatigue reports. It must also be trusted, with crew believing that it will be used for safety purposes, not to attribute blame. The operator must also act following fatigue report submissions, using the data to identify trends in fatigue levels, causes or contributors, and acting

⁵ Freely available from: <https://www.easa.europa.eu/en/downloads/106865/en>

⁶ EASA FTL/FRM Inspector's checklist Support Material for NAAs Inspectors 2022, ORO.FTL.II0(b) ref 4, page 7.

⁷ 'The overall purpose of the internal safety reporting scheme is to use reported information to improve the level of the safety performance of the operator and not to attribute blame', and (c) 'The scheme is an essential part of the overall monitoring function and it is complementary to the normal day-to-day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The scheme is a tool to identify those instances where routine procedures have failed'. GMI ORO.GEN.200(a)(3) (a)

appropriately to mitigate risk to an acceptable level. Actions following fatigue reports may include changing schedules, adjusting the combinations of pairings, or improving hotel accommodation if crew are not able to obtain adequate sleep. Fatigue reporting can also identify areas of improvement for crew training, where increased knowledge may support crew to manage their own fatigue in specific situations.

In the survey, Pilots were asked to select 'all that apply', of the following answer options relating to reporting fatigue in their airline. The proportion of pilots selecting each of the answer options are shown in the table below, and displayed graphically in figure 3.

Answer option	% (n) of pilots selecting this option
I know how to submit a fatigue report	82.0% (5653)
The company communicates well with crew about fatigue reports	13.2% (908)
The fatigue reporting system is easy to access	44.1% (3041)
Fatigue reports are quick and easy to complete	25.4% (1749)
Fatigue reports have led to operational changes to improve safety	10.8% (742)
I trust the fatigue reporting system	12.1% (832)
Not applicable	9.2% (632)

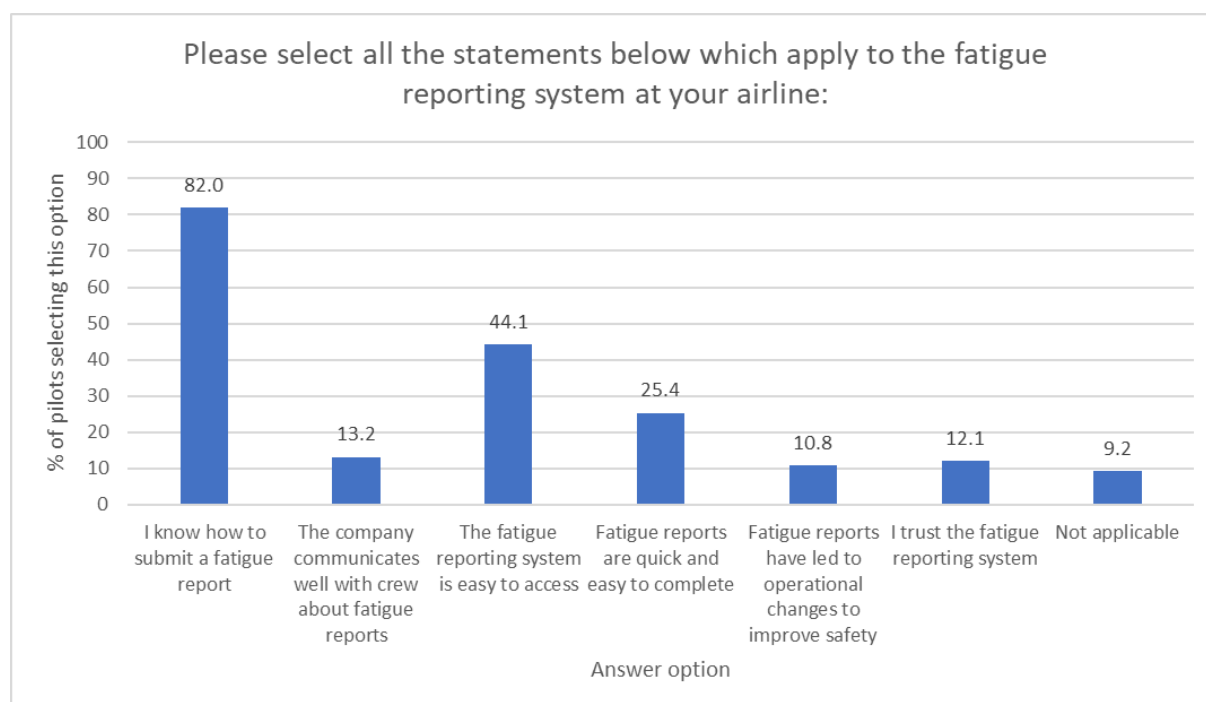


Figure 3: % of pilots selecting each of the answer options relating to fatigue reporting

There are large differences in the proportion of pilots selecting each of these options. 82% of pilots selected that they know how to submit a fatigue report. However, this means that 18% of the pilots completing the survey did not select this option. This could be interpreted as they do not know how to submit a fatigue report. Over 9% of pilots also selected 'not applicable' to this question. This is

concerning. Fatigue reporting should be available to all pilots – whether through the separate reporting scheme or through occurrence reporting⁸.

The other essential components of an effective reporting system were selected by less than half of the pilots responding. This shows that, for many pilots, their reporting system is not effective. Particularly notable is that only 10.8% of the pilots selected that *'fatigue reports have led to operational changes to improve safety'*. Effective fatigue risk management requires not only the collection of data to identify hazards, but also the mitigation of risks that are identified.

Figures 4 to 9 provide the responses to this question according to the AOC country of the respondents. They are all sorted from the AOC country with the highest percentage of pilots selecting that option, to the lowest.

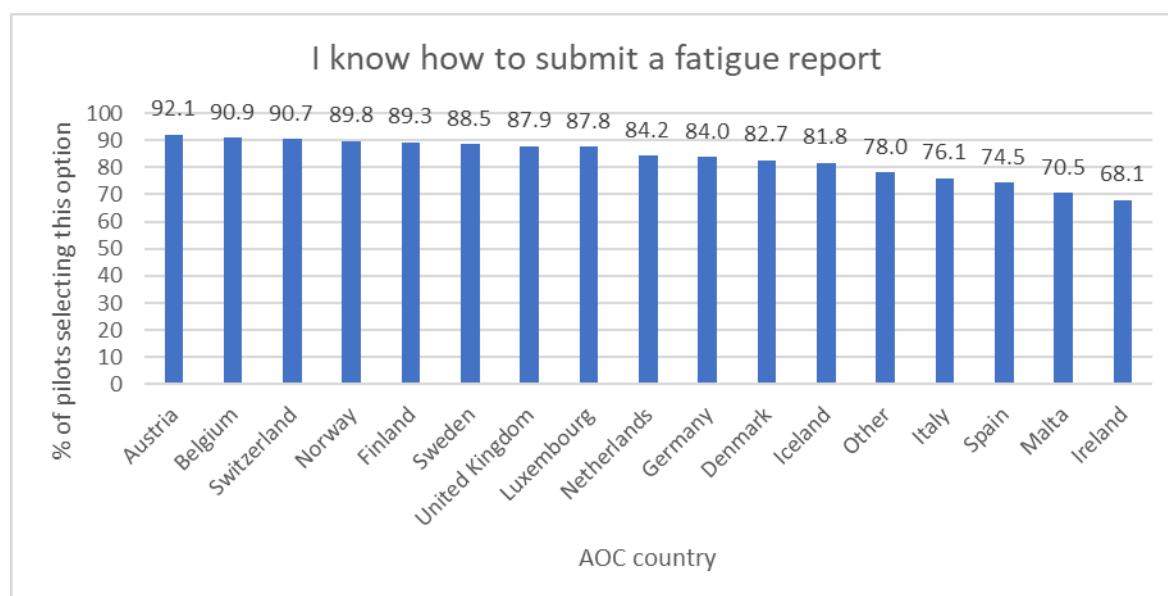


Figure 4: % of pilots from each AOC country who selected 'I know how to submit a fatigue report'. Values are sorted from highest (left) to lowest (right)

As described above, across the whole database, only 82% selected the option 'I know how to submit a fatigue report'. Given the key role that fatigue reporting plays in the identification of fatigue risk, and the amount of time that reporting hazards (including fatigue) has been a requirement for operators, this figure is of concern. Even more concerning is the low proportion of pilots selecting this option from Spanish (74.5%), Maltese (70.5%), and Irish (68.1%) AOCs, indicating a significant competence gap.

For all questions, respondents were able to answer 'don't know' or 'not applicable' to the question, as is good survey practice. For most questions, the number of times these answer options were selected was low, representing 1 or 2% of responses. However, when asked if they know how to submit a fatigue report, 25.0% (n=162) of those from Irish AOCs and 24.5% (n=116) from Maltese AOCs responded that fatigue reporting was not applicable to them. We cannot know why 'not applicable' was selected, but the fatigue reporting process should be available to all throughout the organisation. The question also did not relate to using the reporting system recently (e.g. in the last 4 weeks, a time in which it may be that crew had not flown). Such responses may indicate a further gap in education and training relating to fatigue risk management, where it is not made clear to crew that fatigue reporting is available to them. In all organisations, fatigue reporting should be encouraged

⁸ Regulation (EU) No 376/2014

as a key source of fatigue-related data to enable the effective management of fatigue as discussed above.

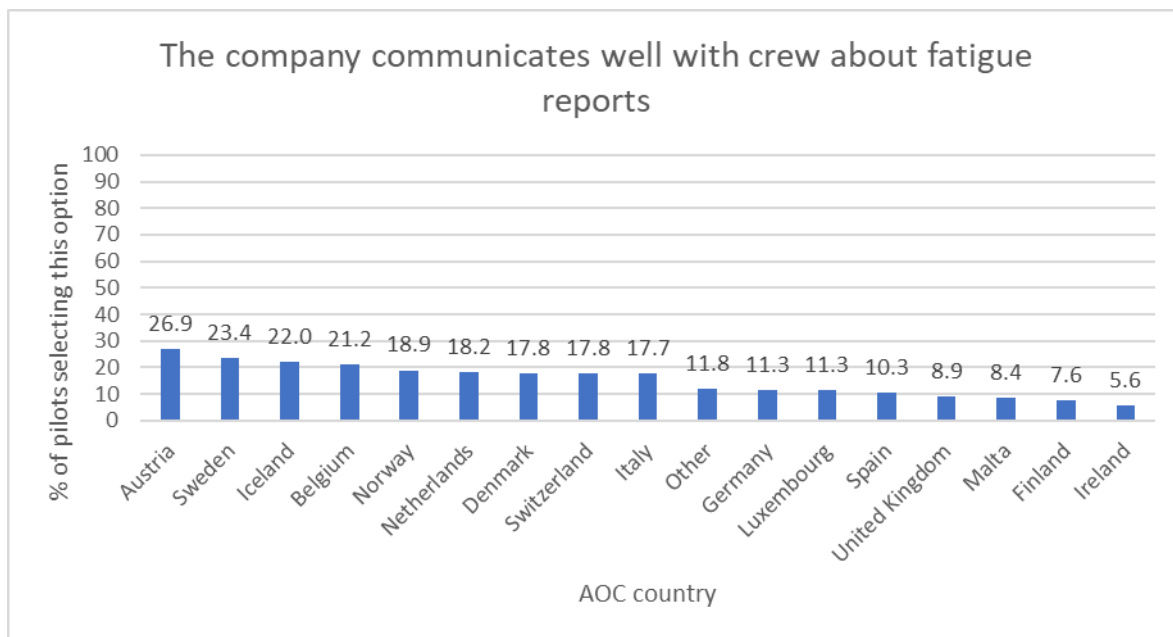


Figure 5: % of pilots from each AOC country who selected 'The company communicates well with crew about fatigue reports'. Values are sorted from highest (left) to lowest (right)

Effective communication about the fatigue reporting system is critical to ensuring that crew feel comfortable and able to report fatigue issues, and also to see feedback and tangible outcomes from their fatigue reports⁹. Across the whole survey, only 13.2% of the pilots selected 'the company communicates well with crew about fatigue reports', which is a very low proportion for such an essential element. The figure was particularly low for those AOC nations at the right-hand side of the graph, with only 5.6% of pilots flying for Irish AOCs selecting that the company communicates well with crew about fatigue reports.

⁹ AMCI ORO.GEN.200(a)(3) (a)(2) 'All reporting systems, including confidential reporting schemes, should include an effective feedback process'

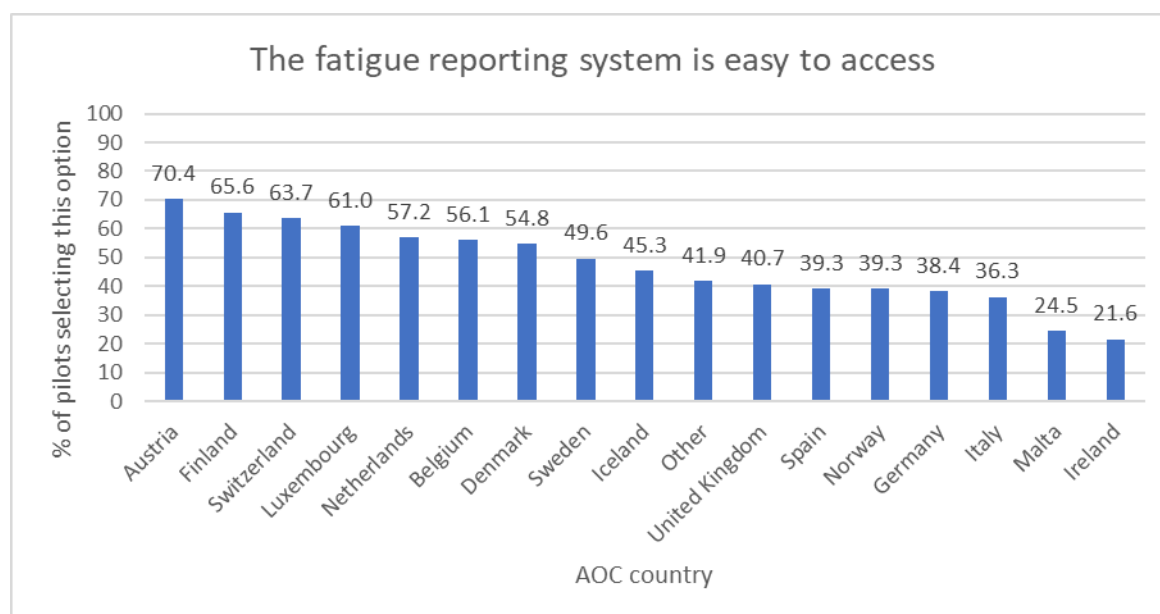


Figure 6: % of pilots from each AOC country who selected 'The fatigue reporting system is easy to access'. Values are sorted from highest (left) to lowest (right)

Overall, 44.1% of the pilots selected that their fatigue reporting system was easy to access. With over half the pilots not selecting this option, the implication is that the fatigue reporting system is not easy to access for them. As figure 6 shows, there is a wide range between the AOC countries most selected (Austria, 70.4% and Finland, 65.6%) and those least selected (Malta, 24.5% and Ireland, 21.6%). Given that, by its very nature, the fatigue reporting system is likely to be accessed by fatigued individuals, it must be easy to access for the fatigue reporting rate to be reflective of fatigue levels across the operation.

It is interesting to note that in figure 5 (*the company communicates well with crew about fatigue reports*), only 7.6% of pilots flying in Finnish AOCs selected that option, ranking them second from bottom. However, in figure 6, 65.6% of pilots in Finnish AOCs selected that the fatigue reporting system is easy to access, ranking them second from the top. For the reporting system to be effective, an operator needs to be consistently committed across the different areas of the reporting system. Even with a good software solution (for example) in place, allowing easy to access fatigue reports, this does not reduce the need for good communication and response to the fatigue reports.

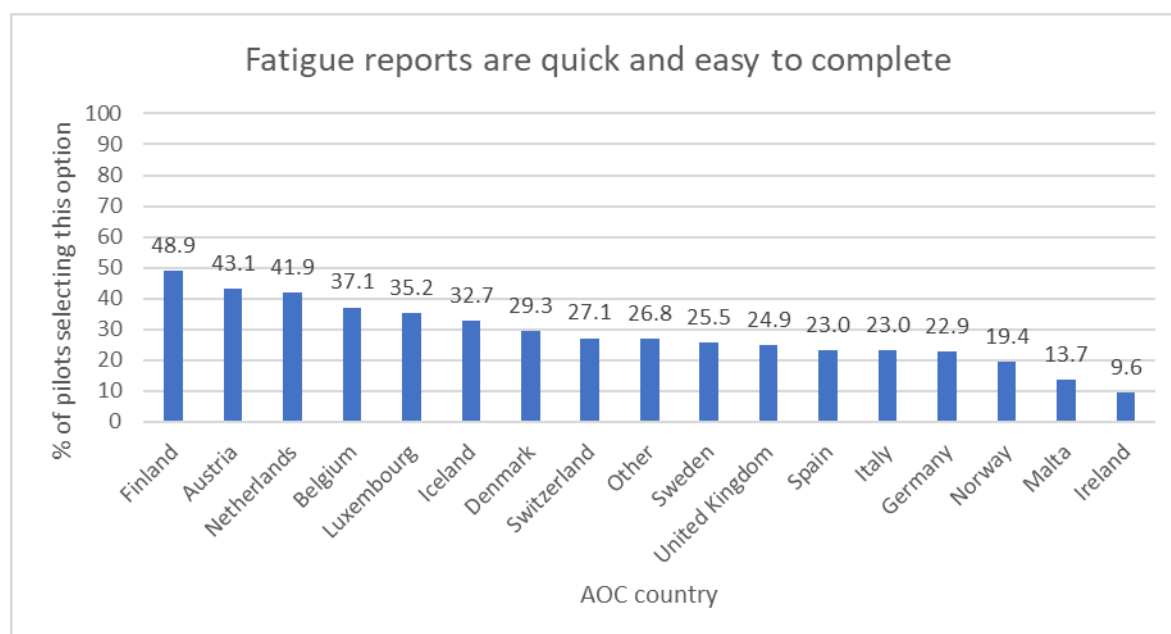


Figure 7: % of pilots from each AOC country who selected 'Fatigue reports are quick and easy to complete'. Values are sorted from highest (left) to lowest (right)

Overall, 25.4% of the pilots selected that reports are quick and easy to complete. This is a lower proportion than finds them easy to access. This may be due to the volume of information captured on some fatigue reports, as well as the usability of the system. In those operators where fatigue reports are both difficult to access and difficult to complete, there is an increased likelihood of under-reporting, impacting the ability of the operator to effectively identify hazards. In figure 6 (*the fatigue reporting system is easy to access*) and figure 7 (*fatigue reports are quick and easy to complete*), Malta and Ireland are ranked the lowest of all the AOC countries. In both graphs, these AOC countries are also some distance below the other nations. By comparison, Finland and Austria are the AOC countries ranked most highly in both figures 6 and 7. Even for these countries though, there is a drop between the proportion of pilots rating that the fatigue reporting system is easy to access to those rating fatigue reports are quick and easy to complete. This indicates further work to do, and a need for standardisation across Europe.

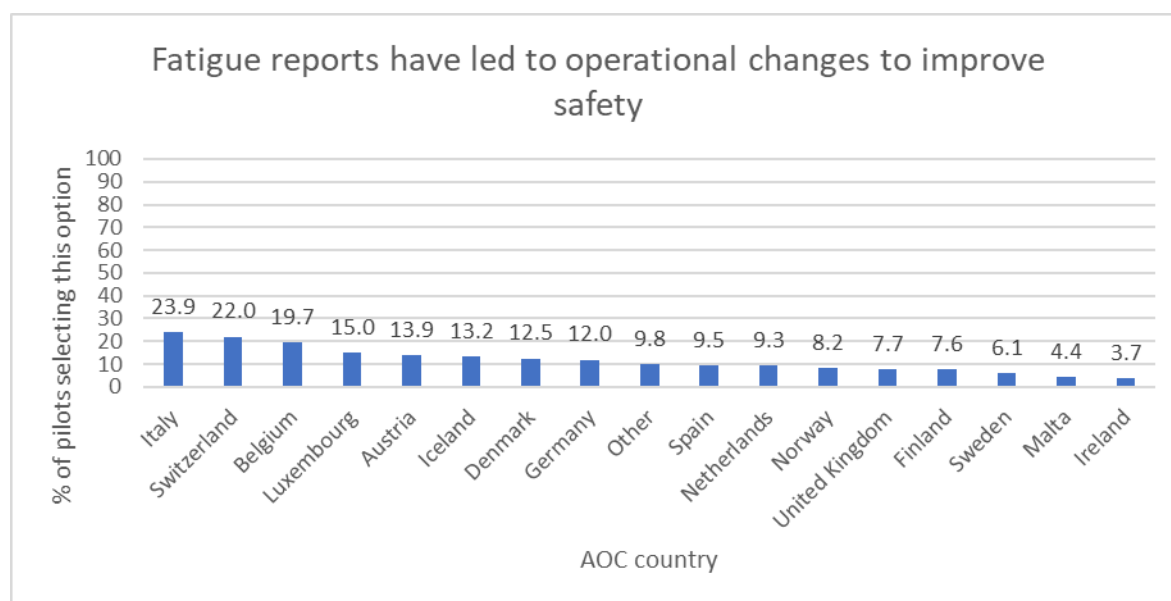


Figure 8: % of pilots from each AOC country who selected 'Fatigue reports have led to operational changes to improve safety'. Values are sorted from highest (left) to lowest (right)

Across the whole survey, only 10.8% of pilots selected that fatigue reports have led to operational change to improve safety. When comparing between AOC countries, this ranges between 23.9% (Italy) and 3.7% (Ireland). Without effective change resulting from submitting fatigue reports, not only is fatigue risk less likely to be effectively managed, but the engagement with the fatigue reporting system may reduce, particularly relating to proactive reports. Where an operator is not making operational change as a result of their hazard identification, they cannot demonstrate systematic continuous improvement in fatigue risk management. Continuous improvement must be demonstrated by all operators across their management system¹⁰, and fatigue is no exception.

¹⁰ AMCI ORO.GEN.200(a)(3) (f) Continuous improvement. The operator should continuously seek to improve its safety performance. Continuous improvement should be achieved through: ... (3) reactive evaluations in order to verify the effectiveness of the system for control and mitigation of risk.

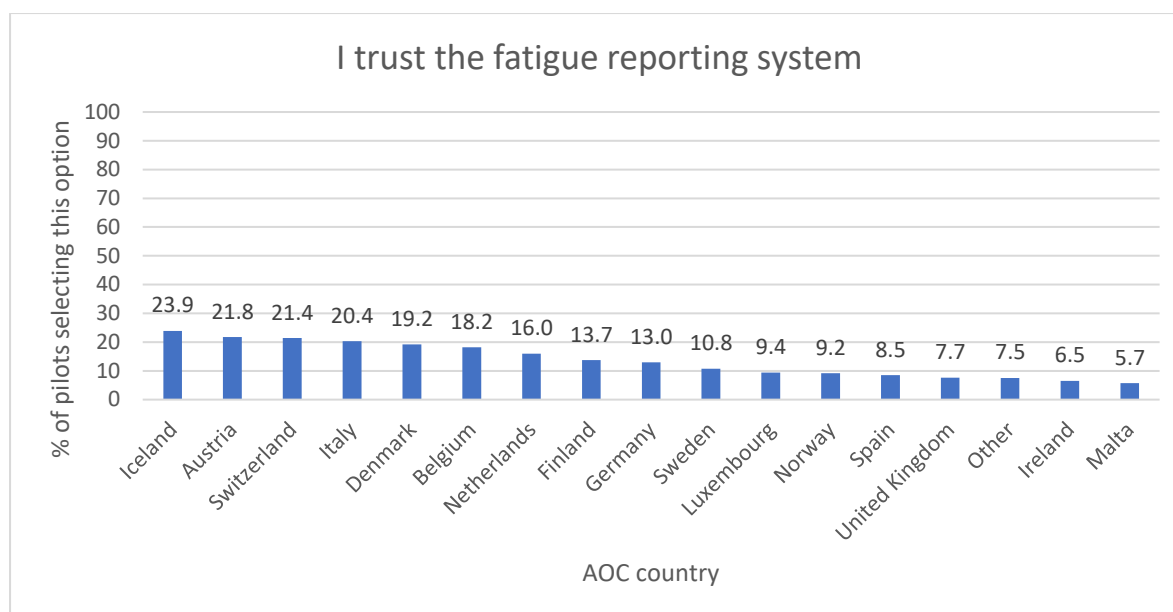


Figure 9: % of pilots from each AOC country who selected 'I trust the fatigue reporting system'. Values are sorted from highest (left) to lowest (right)

Finally, the pilots were given the option to select if they trust the fatigue reporting system. Across all AOCs, there is a very low proportion (12.1%) of pilots selecting this option. This indicates that the culture relating to fatigue reporting requires improvement. Some AOC countries show particularly low values, with less than 10% of pilots in Luxembourg, Norway, Spain, the UK, Ireland and Malta selecting this option.

As part of the overall safety culture within an airline, trust in reporting systems is essential. Where there is a lack of trust, reporting rates will be low, stifling this key source of information to the management system.

What guidance is there for NAAs relating to fatigue reporting?

In the FTL/FRM checklist for NAA's Inspectors by EASA, the expectations regarding the management of fatigue risk within the management system are provided in Part I, reference 14. Checks for the inspector to carry out relating to fatigue reporting are:

- ▶ 'Check if the operator has a system in place allowing crew members to report fatigue (ASR / specific Fatigue reporting form):
 - Check if the operator receives information regarding reporting times, changes, long duties, disruptive schedules.
 - Check if the fatigue reports are trended against (associated with) route, duty pattern and individual
 - Check who assesses the fatigue report forms? Are they sent to the safety department?
 - Check if there is a mechanism in place to give feedback to the reporter'

Additionally, inspectors should:

- ▶ 'Check if fatigue risk mitigations and controls are being verified / audited to confirm their effectiveness'

For Regulators and Inspectors, these checks should identify if the operators they are responsible for are facing challenges with fatigue reporting. The data collected through the survey shows that for all the AOC countries represented in this survey there are areas where fatigue reporting is not

consistent with effective performance. The difference in the proportion of pilots selecting each option between the AOC countries indicates a lack of standardisation across Europe. Additionally, Malta and Ireland are consistently ranked in the bottom 2 or 3 positions across all the answer options. This demonstrates challenges to be further investigated by the national inspectors and EASA.

3.3. Section summary

The survey indicates that operators represented by the pilots responding to this survey are not effectively managing fatigue risk through their management systems. This aligns with the findings from the EASA first study of the Effectiveness of the Flight Time Limitations (FTL) report¹¹, which found that – for late and night FDPs – fatigue was not adequately controlled through the management system.

There was no AOC country where the majority of pilots responding to the survey rated fatigue risk management in their airline as very or mostly well managed. There were also low proportions of pilots selecting key aspects relating to the effectiveness of the fatigue reporting, notably only 10.8% of pilots selected that fatigue reports had led to operational change to improve safety. Making improvements in fatigue reporting systems will likely increase the effectiveness of fatigue risk management, as it will improve hazard identification, and acting on fatigue reports will demonstrate continuous improvement and improve the management of fatigue.

For the NAAs and EASA, the variability between the different AOC countries should be noted. These results show improvement being required in all the countries listed, as well as a lack of standardisation between the countries. The use of the EASA FTL/FRM Inspector’s checklist by the NAA inspectors when auditing their operators should aid in highlighting necessary improvements, and support standardisation approaches.

¹¹ SM.2.1 “Effectiveness of Flight Time Limitation (FTL)” report. Available from <https://www.easa.europa.eu/en/document-library/general-publications/effectiveness-flight-time-limitation-ftl-report>

3.4. Commander's Discretion utilisation, roster stability and rest provision

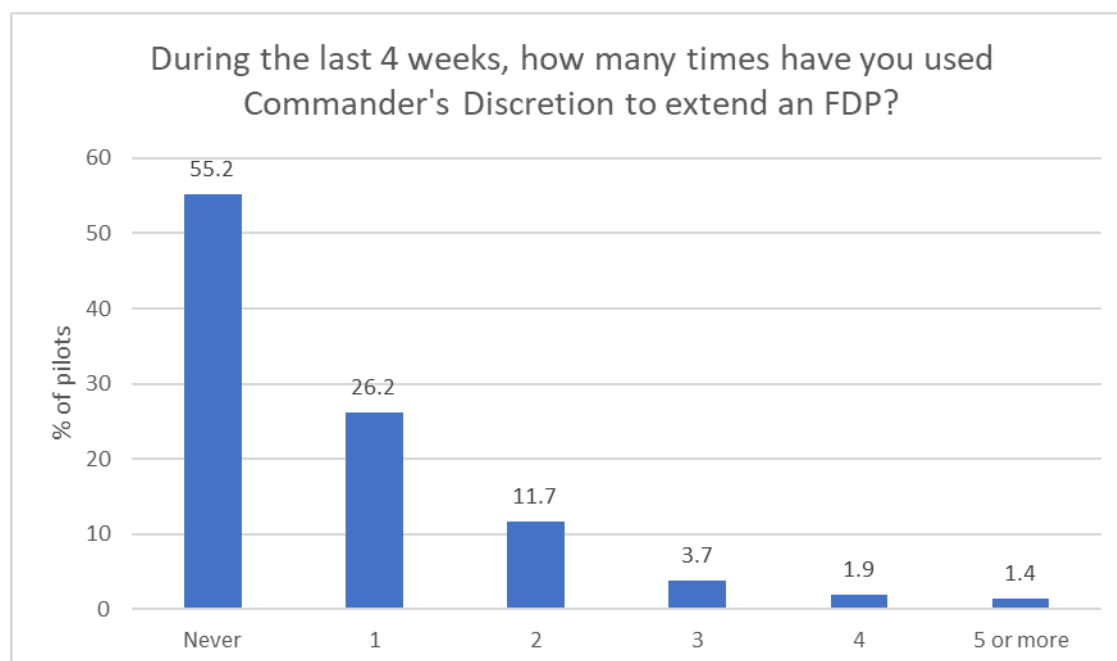


Figure 10: The use of Commander's Discretion to extend an FDP in the 4 weeks prior to completing the survey. N=5849. A further 86 pilots stated that they did not know how many times they had used CD to extend an FDP, whilst 958 selected not applicable.

AMCI ORO.FTL.105(f) (a) states that 'The exercise of commander's discretion should be considered exceptional...'¹². Most crew (55.2%) had not used Commander's Discretion (CD) to extend an FDP in the 4 weeks prior to taking the survey. However, a further 26.2% had used discretion once.

Of concern, 18.7% (n=1093) had used Commander's Discretion to extend an FDP 2 or more times in the last 4 weeks, with 84 survey respondents extending an FDP through Commander's Discretion 5 or more times in the 4-week period. This high level of utilisation of CD suggests that it is not being used for exceptional situations, and instead systematically relied upon to address inadequate rostering.

Between the 4-week 'look-back' period, and the survey open time, the question mostly relates to operations during June and July (the survey closed on the 22nd July 2023), during the ramp-up to the peak summer season. During the summer peak, operations are more stretched and more flights are operated, meaning that there are fewer buffers to prevent operational disruption, and therefore increasing the likelihood of even more Commander's Discretion usage.

Commander's Discretion to extend an FDP should only be used in unforeseen circumstances¹³. Such unforeseen circumstances can be one reason for roster instability. Roster instability is also due to other reasons, one of which is poor planning of the rosters. Of the pilots in the survey:

¹² AMC I ORO.FTL.105(f) (a) '... The exercise of commander's discretion should be considered exceptional and should be avoided at home base and/or company hubs where standby or reserve crew members should be available. Operators should assess on a regular basis the series of pairings where commander's discretion has been exercised in order to be aware of possible inconsistencies in their rostering'

¹³ ORO.FTL.205(f) Unforeseen circumstances in flight operations – commander's discretion

- ▶ 23.9% (n=1639) reported very stable rosters. Of these, 77.1% (n=1090)¹⁴ had not used CD to extend an FDP during the last 4 weeks
- ▶ 14.5% (n=997) reported very unstable rosters. Of these, 27.3% (n=239) had not used CD to extend an FDP during the last 4 weeks

Roster stability is further explored later in this section.

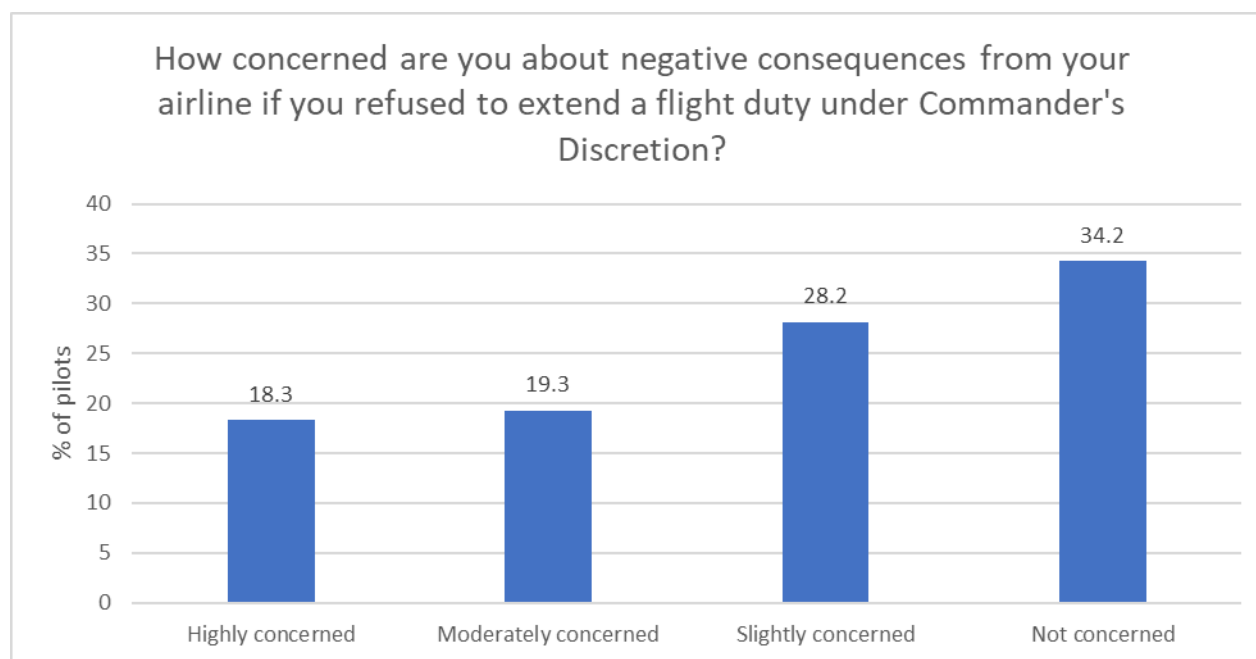


Figure 11: How concerned are you about negative consequences from your airline if you refused to extend a flight duty under Commander's Discretion? N=6588. A further 161 pilots responded 'I don't know' to this question, and 144 selected 'Not applicable'.

The use of Commander's Discretion should be under a non-punitive process¹⁵. This means that not only should there be no negative consequences of refusing to use commander's discretion, but pilots should not fear that there might be. Alarming, 37.6% (n=2476) of pilots were either moderately or highly concerned about negative consequences that may result from refusing to extend a duty under CD. Overall, 65.8% of the pilots responding to the survey indicated that they were concerned about refusing to extend a duty period under CD (either highly, moderately, or slightly concerned). This degree of concern is likely to be represented in elevated pressure felt to accept CD, and potential consequences for flight safety.

This varies by the AOC country, with Malta, Spain and Ireland the three countries with the highest proportion of concerned pilots (figure 12). In each of these countries, over 80% of the pilots reported being concerned about refusing to extend a duty under CD, with 91.4% of pilots flying for Maltese AOCs reporting being concerned about refusing to extend an FDP under CD (Spain: 83.5%; Ireland 81.7%). At the other end of the scale, Austria (46.1%), Luxembourg (45.2%) and the Netherlands (34.9%) had the lowest proportion of concerned pilots (figure 12). However, there is still a degree of concern in these nations.

¹⁴ % provided is those answering both questions

¹⁵ ORO.FTL.205(f)(6): 'The operator shall implement a non-punitive process for the use of the discretion described under this provision and shall describe it in the operations manual'.

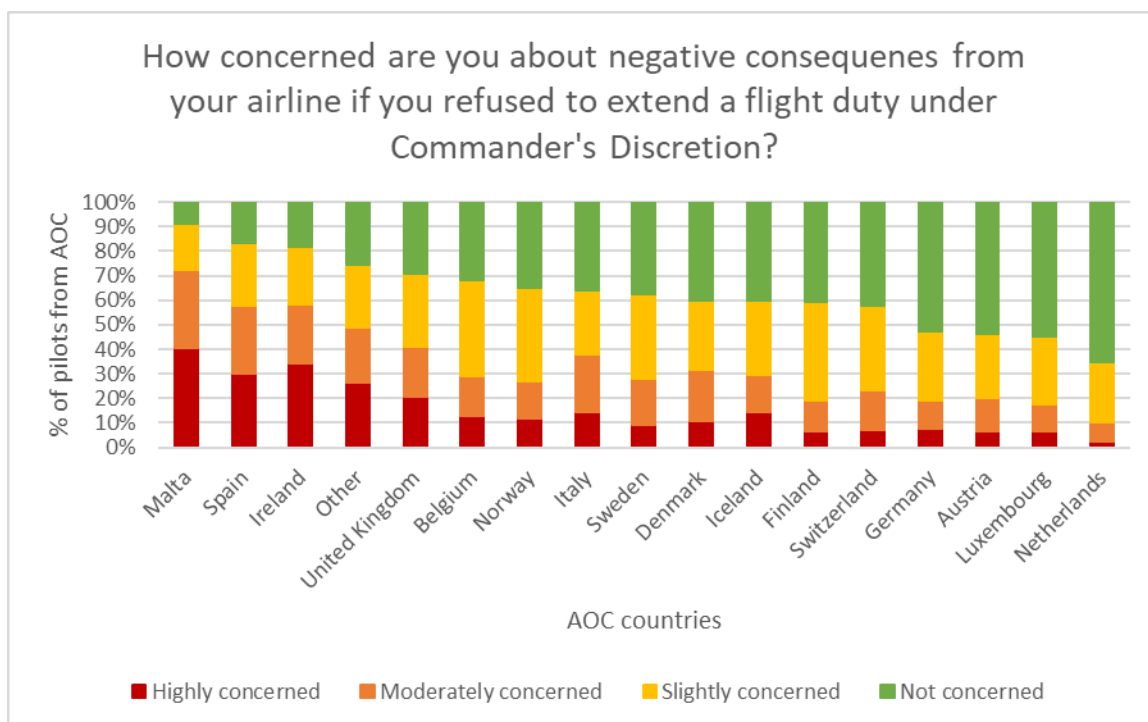


Figure 12: Pilots from the different AOC countries reporting being highly, moderately, slightly or not concerned about refusing to extend an FDP under Commander's Discretion. N=6588 pilots. Graph is sorted according to the AOCs with the highest proportion of pilots selecting highly/moderately/slightly concerned.

As described in relation to figure 10, the use of Commander's Discretion should be considered exceptional. However, across the database, and for individual AOC countries, this is not the case. This is shown in figure 13.

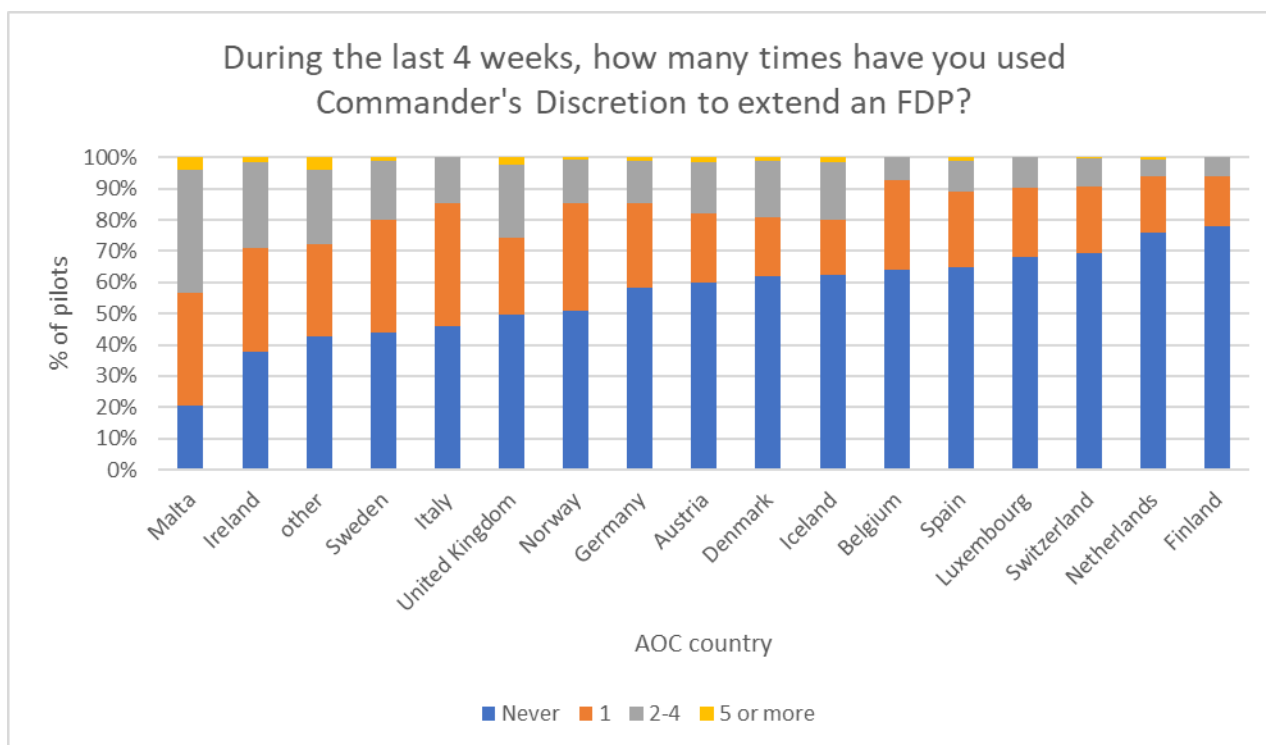


Figure 13: During the last 4 weeks, how many times have you used Commander's Discretion to extend an FDP? % of responses by AOC country. The countries are sorted by the proportion of pilots reporting having used CD to extend an FDP in the last 4 weeks

Figures 12 and figure 13 contain the % of pilots who are concerned about negative consequences of refusing to extend an FDP under CD and the usage of CD, respectively, for each of the AOC countries. Pilots flying for Maltese-based AOCs have both the highest proportion being concerned about refusing to extend a duty under CD, and the highest reported CD usage. However, despite 83.5% of pilots flying for Spanish AOCs reporting being concerned about refusing to extend an FDP under CD, they are one of the nations with a lower amount of CD usage. 35.2% of Spanish pilots have extended an FDP through CD in the last 4 weeks, 11.1% of whom have done this 2 or more times in the 4 week period. These differences show the complexity at play in the decision making as to whether Commander's Discretion is used to extend an FDP.

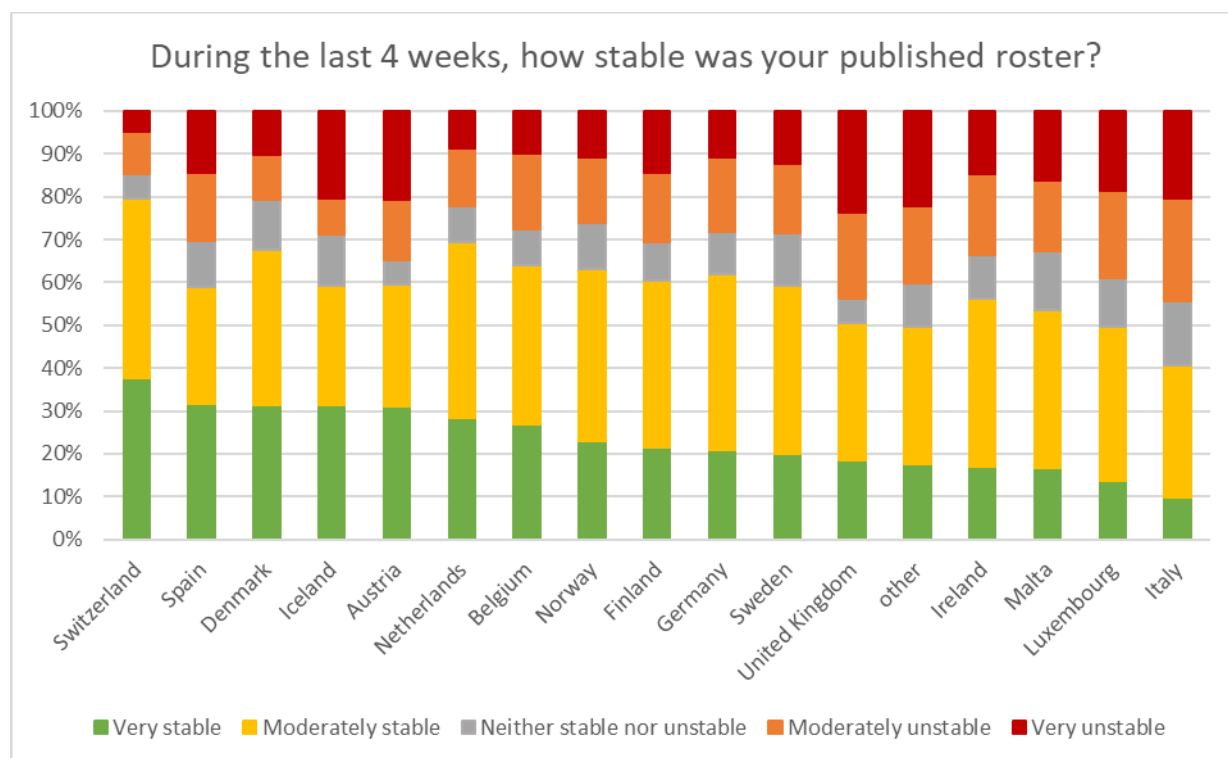


Figure 14: % of respondents from each AOC country selecting the different roster stability levels. N=6857. A further 31 pilots selected 'not applicable', and 5 'I don't know'. Values are sorted by the % in each AOC country selecting that their rosters were 'very stable' in the last 4 weeks.

Across the whole database, 23.9% of the pilots reported that they had very stable rosters in the last 4 weeks. This compared with 35.9% (n=2464) of the pilots reporting a moderately stable roster, 9.5% (n=648) that their roster was neither stable nor unstable, 16.1% (n=1109) moderately unstable, and 14.5% (n=997) reporting that their roster was very unstable.

Roster stability and instability can impact on the fatigue of pilots, both directly through extended duty days and shortened rest periods, and impacting on the ability to plan rest, and also indirectly through introducing stress. The EASA FTL/FRM Inspectors Checklist recommends the following checks relating to the stability of published rosters, and the management of changes to the roster¹⁶:

- ▶ 'Check if the operator identifies roster changes as hazards that may have an adverse effect on fatigue
- ▶ Check if the operator's existing hazard identification, risk assessment and mitigation processes deal with roster changes and their impact on aircrew in a given period

¹⁶ Checks relate to AMCI ORO.GEN.200(a)(3) (e) and ORO.FTL.110(a)

- ▶ Check if the operator's OM-A includes a minimum period of time for notification of roster changes to allow the crew member to plan adequate rest
- ▶ Check for correct implementation of the operator's policy on roster changes ...'

For all but three AOC countries (figure 14), at least 50% of the survey respondents selected that their rosters were either very stable or moderately stable in the last 4 weeks. The three exceptions are:

- ▶ the 'other' group (49.8% selecting very/moderately stable)
- ▶ Luxembourg (49.5% selecting very/moderately stable)
- ▶ Italy (40.7% selecting very/moderately stable).

The adequate provision of rest is essential to allow crew to recover from previous duties, and prepare for upcoming duties. Whilst minimum rest durations are outlined in the regulations, this does not mean that these are appropriate to all operators, who should ensure that their rosters are planned appropriately to avoid fatigue¹⁷.

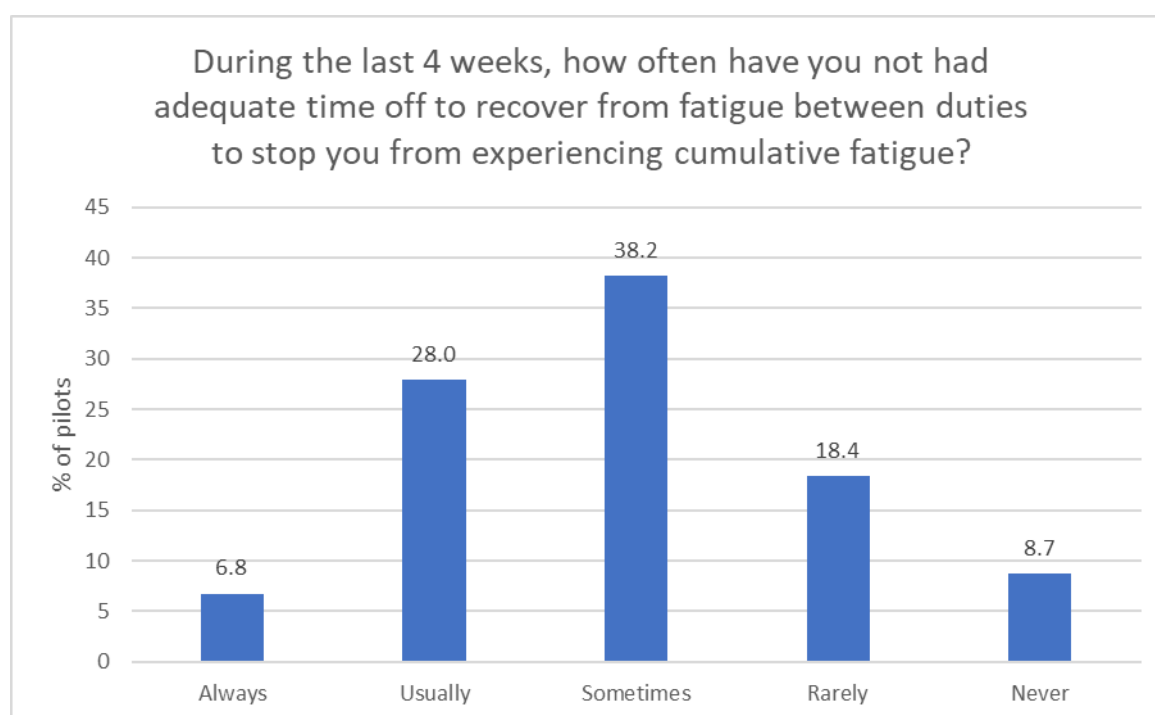


Figure 15: N=6808 pilots. A further 15 pilots selected 'don't know' and 70 'not applicable'. They have been excluded from this graph

Of the pilots, 6.8% (n=460) reported always having insufficient rest between duties to prevent cumulative fatigue, compared with 27.1% (n=1846) who rarely or never had insufficient rest (i.e. usually had enough rest) to prevent cumulative fatigue. The operator responsibilities within ORO.FTL require operators to provide sufficient rest to ensure that crew are rested before their FDPs¹⁸. Not providing sufficient rest will result in elevated fatigue risk for individual duties, and

¹⁷ ORO.FTL.110(b) [An operator shall] 'ensure that flight duty periods are planned in a way that enables crew members to remain sufficiently free from fatigue so that they can operate to a satisfactory level of safety under all circumstances; and ORO.FTL.110(d) 'take into account the relationship between the frequency and pattern of flight duty periods and rest periods and give consideration to the cumulative effects of undertaking long duty hours combined with minimum rest periods'

¹⁸ ORO.FTL.110(g) states [an operator shall] 'provide rest periods of sufficient time to enable crew members to overcome the effects of the previous duties and to be rested by the start of the following flight duty period'.

increase the cumulative fatigue burden across the operation. Given the timing of the survey, this inadequate rest – with 72.9% of pilots sometimes, usually or always reporting inadequate rest to recover – may be an indication of a building fatigue burden prior to the busy summer season. Cumulative fatigue needs appropriate rest to dissipate, and the busy summer season is unlikely to provide additional rest if pilots were not obtaining it during June and July.

The guidance provided to NAA’s Inspectors by EASA relating to ORO.FTL.110(g) states ‘The operator ensures that rest periods allow aircrew to recover from transient and cumulative fatigue and be rested prior to undertaking the next FDP.’

- ▶ Check if operator’s rostering policy/procedures provide for the allocation of sufficient rest periods, especially after long flights crossing time-zones
- ▶ Check if the operator’s rostering policy/procedures provides for the placement of the rest period / sleep opportunity during the optimal sleep time window
- ▶ Check if the operator has means to ensure that the crew member is sufficiently rested for duty when called from other standby or reserve...’

Ensuring adequate rest for crew not only requires the allocation of appropriate rest periods, but also ensuring that sufficient rest remains following roster disruption. As the second check above makes clear, the rest period must consider the timing as well as the duration of the rest. Due to circadian rhythms, rest periods taken during the body clock day-time will be less recuperative, due to the reduced sleep quality and lower likelihood of sleep occurring at all during the day.

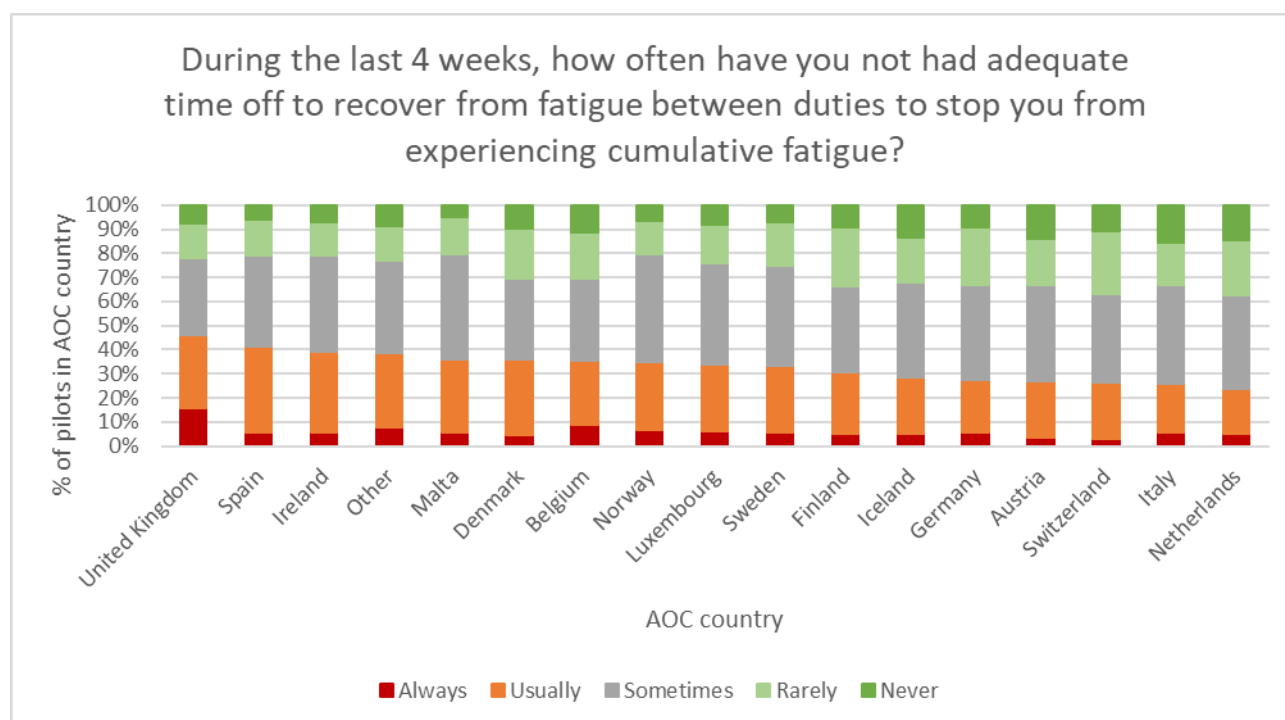


Figure 16: Recovery between duties according to AOC country. N=6808 pilots. Data is sorted by the proportion of pilots reporting that they always/usually have insufficient rest between duties.

When considering AOC location, a stand-out result is that 15.8% (n=136) of those flying for UK-based AOCs reported that they always had insufficient rest, whilst all other AOC locations were closer to the result seen for the dataset as a whole, as shown in figures 15 and 16.

3.5. Section summary

Over half of the pilots responding to this survey had not used Commander's Discretion to extend an FDP during the four weeks prior to the survey period. However, 18.7% of pilots (n=1093) reported using discretion to extend an FDP 2 or more times during a 4-week period, prior to the busy summer peak. This indicates that, within these operations, CD is not being used in unforeseen or exceptional circumstances, as required, rather it is being relied on. This is not what Commander's Discretion is designed for, and indicates a level of disruption that should be managed through better planning or staffing levels. Equally, 37.6% of respondents are 'moderately' or 'highly' concerned about refusing to extend an FDP through CD, extending to 65.8% when including those slightly concerned. CD should be designed as a non-punitive process, where pilots should neither be punished for refusing to utilise it, nor fear any negative consequences of doing so.

The guidance contained in the EASA FTL/FRM Inspector's checklist¹⁹ for NAA's inspectors recommends that Inspectors check the operator's policy relating to CD utilisation, and to:

- ▶ *'Check if the operator includes sufficient margins in rostered FDPs so that commanders do not exercise discretion as a matter of routine*
- ▶ *Check during audits how the operator assesses pairings where commander's discretion has been exercised (...)*
- ▶ *Check if the operator has a procedure how to collect the CD reports and use them for the purpose of evaluating the roster robustness (ORO.FTL I 10(j)).'*

For those AOC countries with a higher level of CD usage, these checks by the NAA inspectors, along with data collected by the operator themselves will be able to determine why CD is being relied upon, so that appropriate corrective actions can be implemented.

The provision of sufficient rest to enable recovery from prior duties and prevent cumulative fatigue is also showing need for improvement. The operator responsibilities in ORO.FTL (which are EU Commission Regulation) require airlines to identify appropriate rest periods for their operation, rather than simply follow those outlined in the FTLs. 34.7% of pilots usually or always have insufficient rest, which increases to 72.9% when sometimes having insufficient rest is included. In these operations, the operator has not yet identified appropriate rest periods for all their operations. Sufficient rest is essential to ensure that the cumulative fatigue burden is kept as low as possible, particularly prior to busy periods where fatigue associated with individual duties may be higher. As the guidance from EASA, quoted above, shows, operators must plan sufficient rest into the rosters, taking into account the prior duties, and the timing of the rest. Where crew are not able to gain sufficient rest, an effective fatigue reporting system is necessary to enable crew to report this and change to be made.

3.6. Microsleeps during flight operations

Microsleeps are brief unintentional periods of sleep that can occur with our eyes open or closed. Microsleeps:

- ▶ Are an indication of significant elevated sleepiness and associated reduced performance, occurring at any time
- ▶ Can be unmasked during periods of low workload, even in the absence of high levels of sleepiness

¹⁹ EASA FTL/FRM Inspector's checklist, Part 2 reference 4. Page 20.

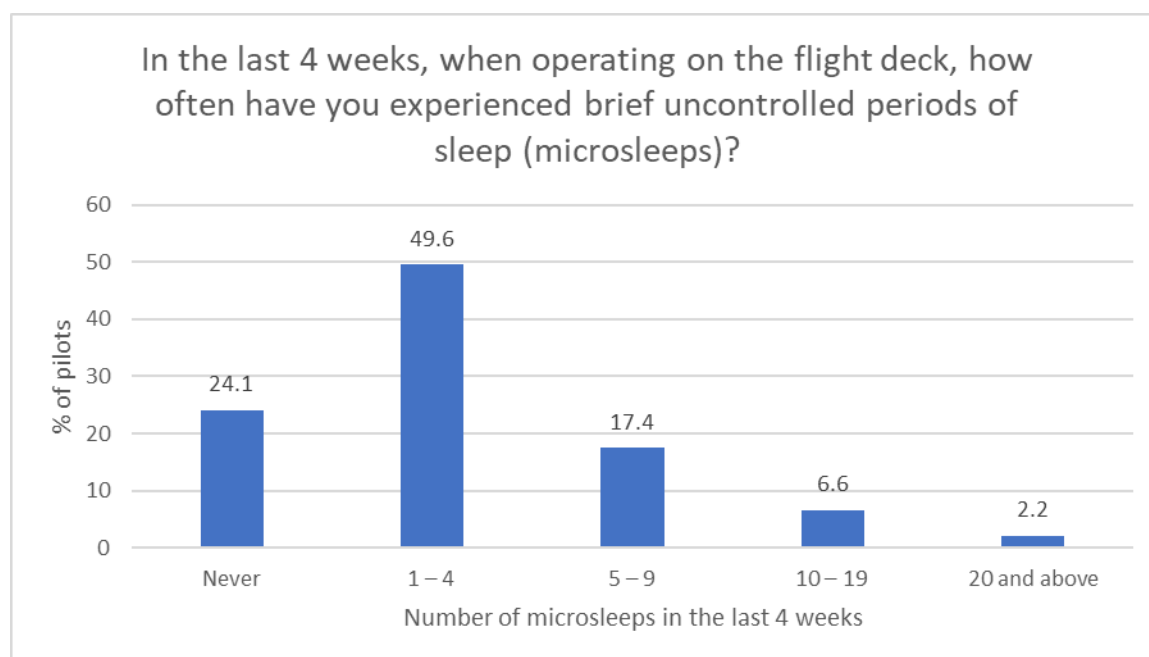


Figure 17: N=6722. Not shown on the graph are 84 pilots who recorded 'don't know', and 87 who recorded 'Not applicable'

In the four weeks prior to completing the survey, during the ramp-up to the busiest part of the summer season, 75.9% of the survey respondents reported at least one microsleep on the flight deck whilst operating. Whilst we do not know the phase of flight in which these microsleeps are occurring, any that occur during descent, approach and landing are associated with increased flight safety risk. As such, microsleeps should be reported to the operator using the fatigue reporting system, and any operator not seeing these reports should investigate the effectiveness of their fatigue reporting system to ensure microsleeps are not missed. The 8.8% of pilots reporting more than 10 microsleeps in the last weeks represents 592 pilots. For these individuals, such a high number of microsleeps in 4 weeks is concerning, as is the fact that 26.2% of pilots (n=1764) reported 5 or more microsleeps in the 4 week period.

3.7. Section summary

Fatigue is a hazard that must be managed through the management system. Over 75% of the pilots responding to this survey indicated that they have experienced at least one microsleep whilst operating in the last 4 weeks, and 592 pilots reported over 10 microsleeps within this period. Where pilots are reporting a high number of microsleeps, fatigue is not being effectively managed. The cause of this fatigue may be within (e.g. due to rosters) or outside (e.g. due to poor sleep at home) the operation, but the risk sits within the operation, and therefore must be managed.

As stated above, if operators are not seeing these microsleeps being reported through the fatigue reporting system, they need to investigate its effectiveness. Microsleeps during critical phases of flight are a clear indication of elevated sleepiness, and a potential flight safety risk, and as such must be identified and mitigated against.

4. Survey summary

This report presents the results of a survey which collected data from 6,893 European airline pilots. This is a large dataset, increasing the confidence in the results presented. The data was collected during the lead-up to the busy summer period in 2023, and demonstrated that there are challenges and inadequacies in the fatigue risk management arrangements of operators across all AOC countries represented, and gaps in the oversight provided by regulators. One of the aims of the survey was to identify areas for improvement in fatigue risk management for both operators and regulators within Europe. It is hoped that, in this respect, this report provides a boost for the industry in continually improving and maturing in the effective management of fatigue for the benefit of all.

As the first section of this report shows, 53.2% of pilots responded that fatigue risk in their airline was either 'mostly not well managed' or 'not well managed' within their airline. Only 22.4% responded that fatigue risk was 'very well managed' or 'mostly well managed'. An example of how fatigue risk management is not implemented as effectively as it should be was then explored in terms of fatigue reporting. Only 82.0% of pilots selected that they know how to submit a fatigue report. Safety reporting has been a requirement for all operations as part of ORO.GEN.200 and Regulation (EU) No 376/2014 for nearly 10 years, and fatigue should simply be considered another hazard to be reported, whether fatigue is reported through a separate form or not. Only 10.8% of the pilots responded that fatigue reports have led to operational changes to improve safety – which reflects that for most pilots, fatigue risk is mostly or not well managed, and a lack of evidence of continuous improvement for the management of fatigue risks.

When comparing the differences between AOC countries, pilots who fly for Irish, Maltese and Spanish-based AOCs were the least likely to select that the statements relating to effective fatigue reporting reflected their experience. Pilots flying for UK-based AOCs were the most likely to report that fatigue risk management was not well managed or mostly not well managed. There were no AOC countries represented in the database where the majority of pilots rated fatigue risk as very or mostly well managed. This, along with the variability between the different AOC nations should be considered by both the NAAs and EASA, as there are clear indications of improvement being required, and a lack of standardisation across European states.

Another focus area that the survey examined was the use of Commander's Discretion to extend an FDP. Whilst over half of the pilots had not used CD to extend a duty period in the 4 weeks prior to taking the survey, 18.7% of the pilots had extended a duty period through CD 2 or more times in the 4-week period. This demonstrates that, rather than being only for exceptional circumstances, Commander's Discretion utilisation is being relied upon in these operations. This is especially concerning given that the survey took place prior to, or at the very beginning of, the busy summer peak. During the height of summer, operations will be more stretched, potentially further increasing the use of CD to extend duties where buffers have been reduced. Despite the requirement for Commander's Discretion policies to be non-punitive, 65.8% of pilots were at least slightly concerned about negative consequences which may arise from refusing to extend an FDP through CD.

Another concern is that, even though the survey was prior to the summer peak, 72.9% of pilots reported sometimes, usually, or always having insufficient rest to allow them to recover from fatigue between duties. This indicates that across Europe, there is potentially already a cumulative fatigue burden when entering a time of year that is traditionally more fatiguing than other periods. Sufficient rest is essential to ensure that cumulative fatigue is kept as low as possible. Operators are also required, through the operator responsibilities, to provide rest periods of sufficient time to enable

crew members to be rested by the start of the following flight duty period. Fatigue reporting plays an essential role here – one of the means of identifying insufficient rest periods is through effective fatigue reporting, but as this survey has demonstrated for many, fatigue reporting is not effective.

The survey was not undertaken at a time when FTLs and fatigue levels were being ‘stress tested’ through the peak of the summer season. Instead, the fatigue levels, with 3 out of 4 responding pilots reporting at least one microsleep on the flight deck in the last 4 weeks, and 3 out of 4 pilots reporting sometimes, usually or always having insufficient rest to prevent cumulative fatigue, are more reflective of ‘normal’ operations. Fatigue levels would be expected to increase into the peak season – particularly if operations are disrupted as they were in 2022.

The results of this survey can, in combination with other data sources, be used by operators to improve the identification of fatigue risks and fatigue levels in their crew populations. This will enable further mitigation of fatigue risk, and more effective fatigue risk management throughout Europe. The explicit requirements for performance-based management of fatigue have been present for airline operators for a number of years. The ORO.FTL requirements have been in place since 2016 (or 2017 for UK-based AOCs), but operators have been required to manage hazards as part of the Management System since ORO.GEN.200 came into force in 2014. Fatigue is simply another hazard. However, it is clear that there are still challenges and that fatigue risk management needs to further mature.

The survey also provides indications for improvement for both NAAs and EASA. Throughout this report, references have been made to the EASA FTL/FRM checklist for NAA Inspectors, which supports in the oversight of operators. The checks and metrics outlined in this checklist will identify gaps in operators’ fatigue management approaches, and allow the development of improvements so that operators can demonstrate that they have fully implemented the regulatory requirements of ORO.FTL. This will support EASA’s aims for standardisation across European nations.

5. Limitations

Potential limitations of this report include:

- ▶ The data is based on a survey, and as such, provides subjective data, which could not be followed up for reasons behind different views because no free text boxes were provided, and the anonymous nature of the survey means that respondents cannot be contacted for more information
- ▶ Survey populations are, by their nature, self-selecting
- ▶ The survey platform was not available in Turkey, meaning no responses could be collected from there
- ▶ Some National Pilot Associations were also undertaking negotiations or other tasks at the time of the survey, meaning their attention and promotion of the survey to their members was reduced
- ▶ The survey was distributed and promoted by Pilot Associations to their members across Europe, this may limit the number of non-union members participating
- ▶ Some countries returned very small response rates, limiting what can be said about specific locations
- ▶ Not selecting an answer in the question relating to fatigue reporting could be interpreted as the Pilots' experience being the opposite of the statement, but that may not necessarily be the case.

The survey was also undertaken prior to the summer peak. Some have critiqued this as a flaw in the methodology, as the fatigue levels returned are likely to be lower than Pilots experience during the height of the summer season. However, it also means that the results can be more representative of flying throughout the other parts of the year. These results show a period when the flying system should not be yet under a great degree of stress due to the high demand.

Appendix I: Survey questions and response options

(Please note, unless clearly denoted below, for all questions participants could select one option from the list provided)

1. Your position
 - a. Captain
 - b. First Officer
2. Your age
 - a. 20-29
 - b. 30-39
 - c. 40-49
 - d. 50-59
 - e. 60 and above
3. Your location: Country of your Home Base
 - a. Austria
 - b. Belgium
 - c. Bulgaria
 - d. Croatia
 - e. Cyprus
 - f. Czech Republic
 - g. Denmark
 - h. Estonia
 - i. Finland
 - j. France
 - k. Germany
 - l. Greece
 - m. Hungary
 - n. Iceland
 - o. Ireland
 - p. Italy
 - q. Latvia
 - r. Lithuania
 - s. Luxembourg
 - t. Malta
 - u. Netherlands
 - v. Norway
 - w. Other
 - x. Other (no fixed base)
 - y. Other (no fixed base – Europe)
 - z. Other (no fixed base – Floating)
 - aa. Other (no fixed base – no base)
 - bb. Other (no fixed base – no fixed base)
 - cc. Other (no fixed base – UK, Ivory coast)
 - dd. Other (no fixed base – YYZ)
 - ee. Poland
 - ff. Portugal
 - gg. Romania
 - hh. Slovakia

- ii. Slovenia
 - jj. Spain
 - kk. Sweden
 - ll. Switzerland
 - mm. United Kingdom
4. Your airline's AOC: Do you know the country of your airline's Air Operator Certificate (AOC)?
- a. Austria
 - b. Belgium
 - c. Bulgaria
 - d. Croatia
 - e. Cyprus
 - f. Czech Republic
 - g. Denmark
 - h. Estonia
 - i. Finland
 - j. France
 - k. Germany
 - l. Greece
 - m. Hungary
 - n. Iceland
 - o. Ireland
 - p. Italy
 - q. Latvia
 - r. Lithuania
 - s. Luxembourg
 - t. Malta
 - u. Netherlands
 - v. Norway
 - w. Poland
 - x. Portugal
 - y. Romania
 - z. Slovakia
 - aa. Slovenia
 - bb. Spain
 - cc. Sweden
 - dd. Switzerland
 - ee. United Kingdom
5. Do you fly (multiple answers possible):
- a. Passenger short-haul
 - b. Passenger long-haul
 - c. Charter
 - d. Low-cost point to point
 - e. Cargo short-haul
 - f. Cargo long-haul
 - g. Network
 - h. Other
6. **Roster stability.** During the last 4 weeks, how stable was your published roster?
- a. Very stable
 - b. Moderately stable

- c. Neither stable nor unstable
 - d. Moderately unstable
 - e. Very unstable
 - f. Not applicable
 - g. I don't know
7. **Commander's Discretion to extend a flight duty.** During the last 4 weeks, how many times have you used Commander's Discretion to extend an FDP?
- a. Never
 - b. 1
 - c. 2
 - d. 3
 - e. 4
 - f. 5-9
 - g. 10 and more
 - h. Don't know
 - i. Not applicable
8. How concerned are you about negative consequences from your airline if you refused to extend a flight duty under Commander's Discretion?
- a. Highly concerned
 - b. Moderately concerned
 - c. Slightly concerned
 - d. Not concerned
 - e. Don't know
 - f. Not applicable
9. **Cumulative fatigue.** During the last 4 weeks, how often have you not had adequate time off to recover from fatigue between duties to stop you from experiencing cumulative fatigue?
- a. Always
 - b. Usually
 - c. Sometimes
 - d. Rarely
 - e. Never
 - f. Don't know
 - g. Not applicable
10. **Microsleeps on the flight deck.** In the last 4 weeks, when operating on the flight deck, how often have you experienced brief uncontrolled periods of sleep (microsleeps), head nodding, or fought to keep your eyes open?
- a. Never
 - b. 1-4
 - c. 5-9
 - d. 10-19
 - e. 20 and above
 - f. Don't know
 - g. Not applicable
11. **Fatigue Risk Management.** In my opinion, fatigue risk at my airline is:
- a. Very well managed
 - b. Mostly well managed
 - c. Neither well managed nor not well managed
 - d. Mostly not well managed
 - e. Not well managed

- f. I don't know
- g. Not applicable

12. **Fatigue reporting system.** Please select **all** the statements below which apply to the fatigue reporting system at your airline.

- a. I know how to submit a fatigue report
- b. The company communicates well with crew about fatigue reports
- c. The fatigue reporting system is easy to access
- d. Fatigue reports are quick and easy to complete
- e. Fatigue reports have led to operational changes to improve safety
- f. I trust the fatigue reporting system
- g. Not applicable

Appendix 2: Countries in the ‘Other’ category due to small number of responses

Where fewer than 100 responses were given for a specific Home Base country or AOC country, they were added to the ‘Other’ category in the analysis. The countries in this category are:

Country of Home Base	Number of responses
Portugal	87
Other	77
Croatia	51
Latvia	46
Poland	25
Romania	25
Greece	14
Malta	13
Hungary	12
Other (no fixed base)	11
Cyprus	7
Estonia	7
Lithuania	7
Bulgaria	5
Slovenia	4
Czech Republic	3
Other (no fixed base – floating)	2
Slovakia	2
Other (no fixed base – Europe)	1
Other (no fixed base – No base)	1
Other (no fixed base – No fixed base)	1
Other (no fixed base – UK, Ivory Coast)	1
Other (no fixed base – YYZ)	1

AOC country	Number of responses
Other	77
France	66
Portugal	57
Latvia	52
Croatia	48
Estonia	38

Lithuania	37
Hungary	23
Poland	19
Greece	10
Romania	8
Bulgaria	6
Cyprus	3
Slovenia	3
Czech Republic	2
Slovakia	2

Appendix 3: Demographics of pilots responding to survey

Rank	% of pilots (n)
Captain	54.5% (3758)
First Officer	45.5% (3135)
Total	100% (6893)

Age	% of pilots (n)
20-29	10.0% (690)
30-39	31.6% (2180)
40-49	30.8% (2122)
50-59	24.4% (1685)
60 and above	3.1% (216)
Total	100% (6893)

Country of your home base	% of pilots (n)
Spain	15.2% (106)
United Kingdom	14.7% (1010)
Germany	13.2% (912)
Switzerland	11.1% (765)
Italy	7.0% (481)
Netherlands	6.3% (433)
Denmark	4.2% (291)
Sweden	3.6% (249)
Luxembourg	3.0% (207)
Norway	2.8% (192)
Ireland	2.6% (182)
Belgium	2.5% (169)
Finland	2.2% (154)
France	2.0% (140)
Iceland	2.0% (140)
Austria	1.7% (119)
Portugal	1.3% (87)
Other	1.1% (77)
Croatia	0.7% (51)
Latvia	0.7% (46)

Poland	0.4% (25)
Romania	0.4% (25)
Greece	0.2% (14)
Malta	0.2% (13)
Hungary	0.2% (12)
Other (no fixed base)	0.2% (11)
Cyprus	0.1% (7)
Estonia	0.1% (7)
Lithuania	0.1% (7)
Bulgaria	0.07% (5)
Slovenia	0.06% (4)
Czech Republic	0.04% (3)
Other (no fixed base – floating)	0.03% (2)
Slovakia	0.03% (2)
Other (no fixed base – Europe)	0.01% (1)
Other (no fixed base – No base)	0.01% (1)
Other (no fixed base – No fixed base)	0.01% (1)
Other (no fixed base – UK, Ivory Coast)	0.01% (1)
Other (no fixed base – YYZ)	0.01% (1)
Total	100% (6893)

Your AOC country	% of pilots (n)
United Kingdom	12.7% (874)
Spain	12.1% (834)
Germany	11.3% (777)
Switzerland	11.2% (771)
Ireland	9.4% (648)
Malta	6.9% (474)
Netherlands	6.1% (418)
Sweden	4.0% (278)
Austria	3.1% (216)
Luxembourg	3.1% (213)
Denmark	3.0% (208)
Norway	2.8% (196)
Iceland	2.3% (159)
Belgium	1.9% (132)
Finland	1.9% (131)
Italy	1.6% (113)

Other	1.1% (77)
France	0.8% (66)
Portugal	0.8% (57)
Latvia	0.8% (52)
Croatia	0.7% (48)
Estonia	0.6% (38)
Lithuania	0.5% (37)
Hungary	0.3% (23)
Poland	0.3% (19)
Greece	0.1% (10)
Romania	0.1% (8)
Bulgaria	0.1% (6)
Cyprus	0.04% (3)
Slovenia	0.14% (3)
Czech Republic	0.03% (2)
Slovakia	0.03% (2)
Total	100% (6893)

Type of flying	N (pilots could select all that apply) ²⁰
Passenger short-haul	4559
Passenger long-haul	1932
Charter	967
Low-cost point-to-point	1341
Cargo short-haul	383
Cargo long-haul	466
Network	968
Other	179

²⁰ Most common combinations: Passenger short-haul/low-cost point-to-point (n=801); Passenger short-haul/network (n=355); Passenger short-haul/charter (n=259); passenger short-haul/passenger long haul (n=253).

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